ABSTRACT

Title of dissertation: OVERCOMING NON-COOPERATION:
DESIGNING A PATENT SYSTEM FOR THE PUBLIC

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Patents allocate power by assigning exclusive property rights to persons who claim to have discovered new scientific or technical art. Accordingly, infringers can be treated like trespassers. In a longstanding theoretical quarrel, some insist that these exclusive rights serve society as incentives to innovation and as just rewards for inventors. Others counter that learning is socially generated and that intangible ideas should not be privately rationed. Theory aside, the institutional facts are polycentric and modulated. While a dominant regime of codes and treaties indeed protects exclusionary property in ideas, several enduring exceptions (subregimes) counter patent exclusivity. Regulations in the technology domains of environment, energy, pesticides, plant genetic resources, and some pharmaceuticals, for example, sometimes set aside strict exclusionary norms and force a patent holder to include others in a semi-commons of cooperative sharing.

This dissertation observes that the polycentricity and variability in the patent system expose resistance to exclusionary property rights in ideas. The resistance is stable and can inspire an institutional redesign that brings inclusive norms into dominance, without forfeit of reasonable social and material rewards for inventors. It further challenges the two prevailing modes of justification for the dominant exclusionary norms. Utilitarian or welfare-maximizing justifications for the exclusionary norms are shown to be both multifarious and conflicting. At the same time, non-consequentialist justifications, under the banner of natural rights for the inventor, stumble because patents can be assigned arbitrarily, waste the resources of non-patent holders, and constrain society's collective liberties to expand knowledge.

This study also supports a "proof of concept" for an alternative, inclusive patent system that 1) operates without prohibitory injunctions; 2) extends licenses-of-right that

compensate inventions without deadweight losses; 3) opens application and examination procedures for better patent quality; and 4) expands private ordering of disputes to lower transaction costs. This inclusive alternative is hardly utopian: the aforementioned subregimes significantly validate the practicality of cooperative, non-exclusive norms.

Overcoming Non-Cooperation:
Designing a Patent System for the Public

By

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Introduction: A Public Franchise or Private Property?

> *We must not overlook the actual fact that dominion over things is also imperium over our fellow human beings.*
>
> Morris R. Cohen[1]

> *Patent holders hold a property in their inventions by as good a title as the farmer holds his farm and flock.*
>
> A Supreme Court precedent
> that was recently both embraced and rejected. [2]

A. Argument in a Nutshell

Patents allocate power by conveying property rights and monopolies to persons who claim to have discovered new scientific or technical art. Accordingly, infringers can be treated like trespassers. In a highly polarized theoretical quarrel, some insist that the exclusive rights of patents are a vital incentive to innovation and that they reflect the inventor's just reward to reap what he sows. Others insist, to the contrary, that learning is socially, not privately generated, adding that because ideas are intangible and inexhaustible, they cannot be privately rationed.

The institutional facts, by contrast, are polycentric and modulated. While a dominant regime of codes and treaties protects exclusionary property in ideas, enduring exceptions (subregimes) dilute patent exclusivity and force patent holders to share this special form of property. Agencies that regulate discoveries in the technology domains of environment, energy, pesticides, plant genetic resources, and pharmaceuticals, for example, set aside the customary strict exclusionary norm and impose rules that straddle the privatizing and the sharing ideals.

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1 "Property and Sovereignty," *Cornell Law Quarterly* 13, no. 1 (1927): 8.

2 Hovey v. Henry 12. F. Cas. 603,604 (No. 6742) (CC Mass. 1846).

Hence, the system rewards non-cooperation and strict exclusions as its default position, but notably reserves a semi-commons norm of managed sharing in other particular conditions. This dissertation argues that the polycentricity and variability in the patent system exposes resistance to exclusionary property rights in ideas. The resistance is stable and can inspire an institutional redesign that brings inclusive norms into dominance, without forfeit of reasonable social and material rewards for inventors. It observes that utilitarian and welfare-maximizing justifications for strict norms lack authority because they are both multifarious and contradictory. Alternative attempts to justify exclusionary norms non-consequentially, under the banner of natural rights, stumble on the problems that patents waste the human resources of non-holders, constrain liberties, and distribute rewards arbitrarily.

The study justifies the feasibility of an alternative, inclusive patent system that 1) operates without prohibitory injunctions; 2) extends licenses-of-right that compensate inventions without deadweight losses; 3) opens application and examination procedures for better diffusion of technical art and patent quality; and 4) uses private ordering to lower transaction costs. These reforms are hardly utopian: the aforementioned exceptional subregimes significantly validate their practicality.

B. Patents as Power: Some Fundamentals

The modern patent system transmutes an idea into private personal property.[3] It creates

[3] See 35 U.S.C. § 261 (Ownership; Assignment) "Subject to the provisions of this title, patents shall have the attributes of personal property." When the term patent or patented device is used in this study it may refer to processes, machines, or compositions of matter used in manufacture and commercial processes. Laws of the United States are the focus of this essay. Texts for references to the United States Code may be accessed at https://www.law.cornell.edu/U.S.Code/text.

a wealth-bearing, transferable asset from what is intellectual and intangible. But patents do more than create a special type of wealth for inventors and their enterprises. They are political commands, empowering some and disabling others. They designate the economic agents who may enforce possessory claims while restraining others from using knowledge, whether for pure experimentation and learning or for profitable commerce. A well-enforced patent can be its holder's injunction against the rest of society. Non-holders are made trespassers in both the incorporeal world of ideas and the domains of the markets.

By restraining non-holders, patents provide the advantages of time. An enterprise can fortify first-mover advantages in competitive markets and hold back competitors from the field of play. This time-based advantage may support the holder's learning curve to develop the cadres of technologists and skilled workers needed to bring a device to maturity. Stymied competitors, by contrast, cannot use the patented article or process to train their workforces. Patent holders also gain time to organize their vendors and supply chains ahead of the competition. Finally, in regard to commercial sales, patents bring early market visibility, product differentiation, and branding, without the noise of competitors. Patents can give their blessings to inactivity, as well as to first-moving action. Even though patents are granted by the state, under current rules, the patent holder, as the declared owner of a province of knowledge, may assert a privilege of nonuse. If it is to his advantage, he may withhold his and everyone else's exploitation of an idea. Arguably then, the holder has the privilege of waste.

The core of United States patent law is found at Title 35 of the U.S. Code or "Patent Code." United States law also embraces the Paris Convention on Industrial Property of 1883, as amended (1979) and the World Trade Organization's Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) (Appendix No. 4 to the Uruguay Round, General Agreement on Tariffs and Trade (GATT) (1994).

The patent code addresses "technical arts"[4] that include methods, machines, or compositions of matter used in manufacturing and commercial processes.[5] The law grants the privilege of these monopolies for 20 years on the condition that the detailed claims and specifications of the invention are published by the patent office—where people may inspect them, but not practice the related technical arts without the patentee's permission until the expiry of the patent grant. A patent demands a surrender of an inventor's secrecy, but not his control of the art. [6] By supervising the approval and publication of a specification, the patent bureaucracy creates property titles for intangibles, so that unauthorized imitators and researchers can be charged (and punished) under the civil wrong of infringement.[7] With their property titles secured, patentees can choose to either enter into or shun contractual licensing arrangements to share inventions. Even when the exclusive holder actively works

[4] Following the taxonomy of Fritz Machlup, a "technical art" requires the combination of data, information and knowledge. Data are separable and perceptible bits, information is the organization of bits in a context, and knowledge is the capacity to use information. Fritz Machlup, "Semantic Quirks" in Fritz Machlup and Una Mansfield, eds., *The Study of Information: Interdisciplinary Messages* (New York: Wiley, 1983), 641. Patents purport to document newly discovered, non-ordinary technical art.

[5] The focus here is on "utility" patents, once called industrial property, which apply to mechanical, electrical, biological, and chemical advances in the form of devices or processes. Other forms of intellectual property are not treated. Design patents and trade dress (distinctive packaging), trademarks, and copyrights are fundamentally different in origins, requirements for protected status, and powers conferred upon their holders. Agencies administering international trade have consolidated all these categories under the name "intellectual property" to coincide with the administrative scope of their agencies and with recent trade agreements. All of these agreements, however, maintain within their provisions, the traditional differentiation of these categories. The term "intellectual property" can be elusive. For example, notable recent controversies with China over the theft of "intellectual property" are focused rarely on patents and more on counterfeiting of brands, copyright piracy, trademark and trade dress misappropriation, and failure to respect non-patented trade secrets.

[6] As long as inventors can successfully protect their technical art with trade secrecy they may, by that means, also be successful in efforts to leverage their status as being a "first mover" in the technical art, gain lead-time to recover investments, and differentiate their devices from others. But trade secrecy can be impractical and expensive: some devices are easy to reverse engineer and surveillance and enforcement over those who may wrongly divulge a secret is often unreliable. See generally, Robert Merges, Peter Menell and Mark Lemley, *Intellectual Property in the New Technology Age (5th Ed)* (New York: Aspen Publishers, 2010), 33-123.

[7] 35 U.S.C. 271(a) (defining infringement of patents) and 28 U.S.C. 1338 (creating federal court jurisdiction regarding patents, plant varieties, copyrights, trademarks).

his invention, we can never test whether his noncooperation has defeated better social returns that *could have been* realized by sharing.

When a patent office decides that a technical art is new and cloaks it with a temporary monopoly grant, it extracts the art from the unfettered public domain of knowledge. Patents shrink the public domain. The process of separating these public and private spheres of invention is an issue with political and moral dimensions. The legitimacy of the rules depends on the conviction that such rules can, with transparency and clarity, draw a clear line to separate the two spheres—exclusionary patents and public domain—without disputes overwhelming the legitimacy of their activity.[8] This study has no quarrel with traditional ideas about enforcement of private rights over *tangible* property. It concedes that well-defined property rights reduce the risks and costs of transactions by creating a stable background for credible commitments for venturing merchants and producers.[9] It allows further that these commitments may often generate confidence to pursue new specializations; they can differentiate the most skilled, productive labor; achieve economies of scale; and make for predictable rates of return. [10] The existence of those mechanisms,

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[8] The uses of trade secrecy as an important alternative means of restricting the use of knowledge is discussed in Chapter II. It is important to remember that inventors do not necessarily rely on government-granted patents to protect a discovery. Valuable and nonobvious technical data may be exchanged under private contractual promises of nondisclosure (i.e., trade secrets).

[9] See Douglas C. North, *Structure and Change in Economic History* (New York: Norton, 1981). Also Douglas C. North and Barry Weingast, "Constitutions and Commitment: Evolution of Institutions Governing Public Choice in 17th Century England," *Journal of Economic History* 49 no. 4(1989).

[10] Harold Demsetz, "Toward a Theory of Property Rights," *The American Economic Review* 45, no. 2 (1967): 359. Demsetz, whose views on the incentives of patenting are widely challenged, makes a classic argument that the common fundamentals of property rights cross all their forms, both tangible and intangible:

> A primary function of property rights is that of guiding incentives to achieve a greater internalization of externalities. Every cost and benefit associated with social interdependencies is a potential externality…. Consider the problems of copyright and patents. If a new idea is freely appropriable by all, if there exist communal rights to new ideas, incentives for developing such ideas will be lacking. The benefits derivable from these ideas will not be concentrated on their originators.

however, does not advance a conclusive justification for public law to transform *intangible* ideas into private property, as provided under the mechanisms of patenting. On this matter, the historical evidence has been unconvincing. Even if we allow that individual inventors and enterprises may use a patent incentive to fulfill their expectations for a venture, the system rules also promote non-cooperation, dissipation of resources, and uncertainties that deter the pursuit of research, to say nothing of the deadweight losses of monopoly for the commercial public when an exclusionary patent commands the uses of a technical art.

1. Patents Seen As a Regulatory Cure for a Market Failure

Supporters of patents fear that two ills will breed without government sponsorship of a strong patent system. Implied by these two fears is the admission that the unregulated public domain (and the unregulated market) fails to optimize the use of social resources. First, without patenting, it is feared that imitators will poach ideas before their creators recover their investments. If so, inventors may not venture. Patent regulation can support the expectations of revenue streams that induce investments that inventors would not otherwise undertake. Implicitly then, the unregulated market is conceded to be non-optimal. Second, if inventions are maintained under trade secrecy, rather than published as patents, the ostensible payoffs of an early publication of discoveries are deferred indefinitely. Implicitly, the unregulated market will be non-optimal for diffusion of learning. From these perspectives, patents provide a regulatory response to a market failure to best support innovation and learning. Another outlook has recognition, however. When, by contrast, patented ideas become attached to the legal attributes of private property in land or goods, the government acts as a protector of private rights, instead of regulator. As the Fifth Amendment to the Constitution may defend my home, so also must the patent code protect

my idea—the argument goes. Patents thereby become a subspecies of personal property rights in general.

In a notable example of the latter perspective, the mission statement the Center for the Protection of Intellectual Property (CPIP), an affiliate of the George Mason University, Scalia School of Law and a commercially supported think-tank, joins the notions of patent property and "flourishing individual lives,"

> CPIP is dedicated to the scholarly analysis of intellectual property rights and the technological, commercial, and creative innovation they facilitate. CPIP explores how stable and effective property rights in innovation and creativity can foster successful and flourishing individual lives and national economies. [11]

Similarly, the 2016 Platform of the Republican Party, in a chapter called "A Rebirth of Constitutional Government" that laments excessive regulation, excuses patent rights because they are parallel to rights in physical property and drive American values into the global marketplace. The party position, titled "The Fifth Amendment: Intellectual Property Rights," exonerates patents from the taint of regulation and, going further, maintains that as personal property and the object of private contracting, patents are tools of resistance to regulatory barriers:

> Private property includes not only physical property such as lands and homes, but also intellectual property like books and patents. … With the rise of the digital economy, it has become even more *critical that we protect intellectual property*

[11] Mission Statement, Center for the Protection of Intellectual Property, accessed November 19, 2018, at https://cpip.gmu.edu/about/about-cpip/. Similar, expressions of the cultural as well as economic benefit of the patent system are advanced by the U.S. Chamber of Commerce's Global Innovation Policy Center (GIPC), which relies on the Chamber's numerous foreign offices to advocate strong enforcement of intellectual property rights. GIPC's mission is published at https://www.theglobalipcenter.com, accessed January 9, 2019.

> *rights and preserve freedom of contract rather than create regulatory barriers to creativity, growth, and innovation*.[12] (Emphasis supplied)

On the other hand, patents' role as a critical tool of regulation to support business has had equally forceful advocacy, especially since the 1980s. Congress justified reforms over patent dispute jurisdiction in United States courts in 1982 as an extension of macroeconomic policies. It assigned all appellate reviews of patent cases to the specially formed Court of Appeals for the Federal Circuit that replaced the Court of Customs and Patent Appeals. The new Federal Circuit court now hears patent appeals arising out of the United States Trademark and Patent Office, but also appeals arising out of federal district court actions on infringements, giving it an ascendant and unifying role in legal interpretation of the patent law over all bodies but the Supreme Court. The Court's first Chief Judge, Pauline Newman, described creation of the new appeals court as Congress's assignment of a regulatory "mission":

> The court was formed for one need, to recover the value of the patent system as an incentive to industry. The combination of the Court of Claims and the Court of Customs and Patent Appeals was not desired of itself, it was done for this larger purpose. This was our mission—our only mission. [13]

Elaborating further,

> The congressional intent . . . was quite clearly stated. It was to give a boost to innovation and encourage investment in invention in technology-based industries because it was recognized that this was the only area of domestic product in which the nation still had a positive balance of trade. Our net balance of trade at that time

[12] "A Rebirth of Constitutional Government (2016)," accessed Nov.15, 2018 at https://prod-cdn-static.gop.com/media/documents/DRAFT_12_FINAL[1]-ben_1468872234.pdf.

[13] Honorable Pauline Newman, Judge U.S. Court of Appeals for the Federal Circuit, Address to the Federal Circuit Law Clerks (February 5, 2010), 28 years after the court's founding. Quoted in G.C Beighley, Jr., "The Court of Appeals for the Federal Circuit: Has it Fulfilled Congressional Expectations?" *Fordham Intellectual Property, Media & Entertainment Law Journal*, *21*, (2011): 702.

> was negative ... for the first time since the Revolutionary War. The need [to]improve our balance of trade] was very clear. It was not speculative. Undoubtedly, it was the understanding of that need that . . . encouraged Congress to make this quite dramatic change in judicial structure by forming the Federal Circuit.[14]

2. The Supreme Court's 2018 Joust on the Source of a Patent's Power

The debate over treating a patent as a regulatory matter or a property right is more unsettled than ever. As the planning of this essay began in April 2018, the Supreme Court demonstrated the persistence of this philosophical divide in a very odd way, where obscure points of old law drove contemporary outcomes. Two conservative justices, whose views are typically allied, squared off in the "regulation vs. property" debate. In *Oil States Energy Services, LLC v. Greene's Energy Group, LLC* [15] the Court considered the constitutionality of new procedures for withdrawing a patent grant upon discovery of either fraud by the applicant or errors by the patent office after it identifies prior art that would defeat a holder's claims of novelty or inventor originality. Against dissent, Justice Clarence Thomas, for the majority, wrote that a patent was both a "public right" and a "public franchise" whose granting depended wholly on administrative offices that could, reciprocally, withdraw such grants by a non-judicial, administrative procedure.[16] Justice Neil Gorsuch, with Chief Justice Roberts joining, argued for the minority that, once granted, the patentee did not hold a mere revocable public franchise, but (quoting an early 19th century precedent) that "patent holders hold a property in their inventions by as good a title as the farmer holds his farm and

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[14] Ibid.

[15] Oil States Energy Services, LLC v. Greene's Energy Group, LLC, 584 U.S. ___ (2018) (No. 16-712 Slip Opinion, for the Court at 7). (April 24, 2018).

[16] Oil States Energy, Slip Opinion, for the Court at 7.

flock."[17] Because the patent grant created private property that was legally indistinguishable from tangible property, an administrative action was improper under this maxim. The patent holder could only lose such property after a hearing in the constitutionally enabled Article III courts with life-tenured judges. Per Gorsuch, the administrative proceedings that the majority decided to allow should have been unconstitutional. In rejecting the public franchise model, Gorsuch infused American patent law with natural law, invoking the 1813 view of Chief Justice Marshall that American patents are recognized as "inchoate property" that exists "from the moment of invention."[18] Gorsuch's reliance on the old "moment of invention" formulation is curious today, since American law in 2011 adopted the principle of honoring the claims of the first party to file a patent over the first party to conceptualize or prototype the invention.[19] Nevertheless, Justice Gorsuch's opinion argued for the affiliation of natural law, inventions, and private property rights.

The majority opinion also brought its own allotment of authoritative old law into the joust. Thomas opined on the meaning of the now obscure ancient writ of *scire facias* (a form of challenge to official acts no longer used in contemporary jurisprudence) and the powers of the England's 18th century Privy Council, because these mechanisms were once used to withdraw patent rights by administrative orders in times close to the American founding. Justice Thomas chose also to be persuaded by another 19th century U.S.

[17] Oil States Energy, Slip Opinion, Dissent of Gorsuch at 8, (quoting Hovey v. Henry 12. F. Cas. 603, 604 (n No 6742) (CC Mass. 1846)).

[18] Ibid. Quoting Marshall in Evans v. Jordan, 8 F.Cas. 872, 873 (No. 4564)(CC Va. 1813).

[19]Leahy-Smith America Invents Act (2011), Public Law 112–29, 112th Congress, Section 3 (effective March 12, 2013) (substantially eliminating adjudications of challenges to patent validity based on prior invention).

precedent: "By issuing patents' the patent office 'takes from the public rights of the immense value and bestows them upon the patentee."[20] Hence, Thomas, speaking for the Court, focused not on the government post-patent takings from the patentee, but rather on a pre-patent takings from the public—emphasizing patents as a diminishment of a preexisting public right of access to a knowledge domain. By implication, the patent is not, in this regard, an expression of a natural right to private property, but a politically constructed regulation of the public domain. By further implication, the domain of knowledge, pre-or post-invention, belongs to the public subject to Congress's exercise of positive, not natural law.

The Gorsuch-Thomas debate, fought on the conservative side of the Court, arose in the narrow, but nontrivial context of post-grant review of the validity of the patent. Its importance for this discussion, however, is in its exposure of the enduring perplexity over the basis for legitimacy of political power over ideas. Who is the patent system designed to serve? Does Congress derogate personal, constitutionally protected property rights by giving regulators post-grant controls over the privileges that these same regulators gave to the successful patent applicant? Under the franchise view, which *Oil States* applied in this narrow area of the patent code, the private privileges of holders were *not* ascendant. There, the public rights exceeded the revocable private ones. In other contexts of patent administration, however, exclusionary property rights of the patentee remain firmly embedded. As will be discussed in subsequent chapters, the puzzle manifested in the competing legal theories in *Oil States* is a recurring one in policy and administration.

[20] Ibid. Quoting United States v. American Bell Telephone Co., 123 U.S. 315,370 (1888). (Oil States, Slip Opinion, for the Court, at 7).

It is fair to conclude *for now,* however*,* that the courts have not sacralized the private view of patent legitimacy or put handcuffs on future legislation that limits private rights. If legal reasoning gives some favor to the public franchise view, as the majority *Oil States* did, should public policy lay more skepticism on the private property view beyond the narrow issue treated in that case?

C. The Work Plan for a Design Alternative

We argue that reconciliation is possible between two countervailing political and ethical impulses. The aim to secure private rights for inventors based on their moral deservingness to reap what they sow can be harmonized with respect for learning as a socially generated common property that must be shared with few restraints. Adherents of the first position confront antagonists from the second, who point to the innovation-suppressive effects of patents and object to the constraints imposed on the liberty of researchers who work under an imposed scarcity of knowledge resources.[21] Patents need not be conceptualized solely as a tool to provide a personal strategic advantage to their claimants, and the system can be a tool to promote collaborative efforts while preserving, short of monopoly, rewards for the inventors who risk time and money to apply their learning to new technical arts. To achieve this, two questions require answers:

1) *What rules need to be jettisoned and what rules need to be introduced to promote the sharing of discoveries and cooperation for their improvements?*

[21] For a description of early debates related to public accountability of industrial patentees see Daniel J. Kevles, "The National Science Foundation and the Debate Over Postwar Research Policy 1942-1945*,"* *ISIS* 68, no. 241 (1977): 5-26.

2) *What non-monopolizing mechanisms will still allow successful inventors to avoid forfeitures on account of imitators?*

The answers and their justifications proceed in five chapters. The first chapter maps how a modern patent regime's exclusionary rules impose norms of non-cooperation. It looks at the practices that institutionalize an "anti-commons" and reviews the distinguished chorus of voices among political economists, Nobel laureates and others, who reject the case for knowledge monopoly. It explores a "fundamental paradox of patents," which holds that patents unavoidably cause the underutilization of both available knowledge and the talent of those who can expand it. Finally, it enumerates the privileges and liabilities that defeat creative cooperation and the rulemaking powers of the state to modify the existing model.

The second chapter argues that exclusionary patents lack normative justifications. It tests the two normative modes of justification that are commonly advanced in defense of strong exclusionary patents for private actors—utilitarian (welfare maximizing) and deontological (non-consequential). Utilitarians disagree fundamentally regarding what utilities (outcomes) patents are supposed to maximize to secure the greatest welfare. The disagreements expose the practical, hands-on conflicts between the creators who pioneer a patentable concept and the follow-on inventors whose improvements can make the patent commercially accessible. Utility, however, is not the only basis to justify rules. It is still possible that non-consequential reasons should move our sense of justice and warrant the assignment of private property rights to technical ideas. This line of thinking confronts difficulty as well. To be sure, advocates of the strictest terms of patent exclusivity have proclaimed the ethical directive that an inventor's personal labor should yield a possessory reward. But to the contrary, the writings of Locke, Franklin, Jefferson, and Madison (who represent a political tradition that relies on natural

rights) dispute the authority of this directive for technical and scientific endeavors. They are unsympathetic to exclusionary privileges as rewards for an inventor's labors. The chapter also examines libertarian theorists who, notwithstanding their customary defenses of private holdings, reject the patent system because of its reliance on invasive government agencies that restrict contractual liberties and assign privileges arbitrarily.

The third chapter observes how the normative confusions play out in practical policy. It identifies the variants and countercurrents to exclusionary patent rights, in the form of enforced sharing of patents that Congress directs certain agencies and programs to impose. This chapter examines enduring subregimes or exceptions to the dominant protections of exclusionary monopolies over ideas. Even though the subregimes affect a very small volume of issued patents, the conceptual weight of their rules challenges the regular, dominant practice. From this point of view, the patent system is polycentric and multi-organizational, with different agencies administering patents over different technical arts in different ways. The subregimes dilute patent exclusivity and force patent holders to share this special form of property. Agencies that regulate discoveries in the technology domains of environment, energy, pesticides, plant genetic resources, and pharmaceuticals, for example, set aside the customary strict exclusionary norm and impose rules that straddle a privatizing and a sharing ideal. The salient characteristic of these subregimes is the right of non-holders to demand a paid license from a patent holder and the suspension of the holder's power to seek prohibitory injunctions to control the use of an invention. Subregimes represent mutations that could become the dominant trait.

The fourth chapter extracts from the multi-organizational subregimes a proof of concept for a redesigned system in which sharing norms are dominant and knowledge monopolies are

proscribed. It preserves polycentric flexibility for the distribution of new knowledge, recognizing that the optimal conditions for discovery and diffusion of innovation will differently accommodate different technical arts. The underlying logic of this redesign is that the patent holders' powers and privileges must be conditioned on the availability of ideas for public use, while inventors are allowed, residually, to maintain claims for reimbursement of their research costs from those who use their ideas. Reasonable compensatory licensing and state-sponsored rewards will protect inventors from the unjust results of imitation and poaching while requiring open access and inclusion for other inventors and research enterprises. Each of these ideas has a legal and institutional heritage from which to advance such a transformation. We aim for an institutional design that is non-utopian and builds on rules and practices of agencies, as they exist today.

The conclusion revisits the critique of chapters one and two, where a strict exclusionary patent system was challenged as unredeemable and worthy of elimination. Here we observe two qualified, redemptive justifications for retaining a patent system, provided that its non-cooperative and exclusionary norms are neutralized. First, social returns aside, the inventors, *as persons,* deserve recognition as esteemed contributors in an ideal social order. While that honor cannot include being monopolists, it can include certain practical protections against investment forfeitures and mechanisms for public recognition of their willingness to share learning. Second, policy can and should reverse the conventional picture of means and ends in this domain. Traditionally, patents have been viewed as the means of moving individual inventors toward the end of creating new technical art. Instead, we should see the patent system as the means to create low-risk collaborative exchanges among inventors and their enterprises. The desired goal of the system will be procedures for sharing ideas, not the

fortification of exclusions. The collaborative mechanisms of the system, not just the property rights created, will be its *most* valued result.

Chapter I: Rules That Privilege Non-Cooperation

> *When the explanation of a social phenomenon is undertaken, we must seek separately the efficient cause which produces it and the function it fulfills*.
>
> Emile Durkheim[22]

A. Distinguished Critics Declare: "This System Is Broken"

The words of Durkheim are particularly apt when we observe the disparities between the seeming motivation behind the patent system and the results it produces. Economists of diverse schools and methods argue that the patent system on both international and domestic levels could be repudiated and jettisoned without hurting the diffusion of new technology or discouraging enterprise risk. The reflections of seven Nobel laureates illustrate the breadth of the disapproval: F.A. Hayek, James Buchanan, Kenneth Arrow, Eric Maskin, Amartya Sen, Joseph Stiglitz, and Edmund Phelps. They have argued that no data reliably supports the systematic benefits of patenting. They observe also the negative social returns caused by the system, rather than individual returns that a patent may give to its holder.

F.A. Hayek raises the anticompetitive effects of the patent rules, questions whether the concept of property has been "slavishly" extended to intangibles, and proposes that other mechanisms should reward inventors,

> The problem of the prevention of monopoly and the preservation of competition is raised much more acutely in certain other fields to which the concept of property has been extended only in recent times. I am thinking here of the extension of the concept of property to such rights and privileges as patents for inventions.... It seems to me beyond doubt that in these fields a slavish application of the concept of property as it has been developed for material things has done a great deal to foster the growth of monopoly and that here drastic reforms may be required if competition is to be made to work. In the field of industrial patents in particular we shall have to seriously to examine whether the award of a monopoly privilege is

[22] Emile Durkheim, *The Rules of Sociological Method* (New York, The Free Press, 1950) 95.

> really the most appropriate and effective form of reward for the kind of risk-bearing which investment in scientific research involves.[23]

James Buchanan's public choice principles disapprove of patents for pioneering technology, pointing to the problem of wastage from regulatory capture. He argues that the exclusive patent licensing rights on basic research, fortified by regulatory bureaucracy, generate rents for those who are privileged by the rules to the prejudice of potential follow-on developers. "As a result," he says, "development is stifled, especially when patent protection is itself designed to offer the basic motivation for investment in research." [24] Disciples of Buchanan's Virginia School of Political Economy expand on the problem of excessive regulatory capture, citing U.S court reorganizations of the 1980s under which the litigation sponsored by the patent bar expanded patentable subject matter, the number of patents issued annually, and the amount of patent litigation. These developments, they argue, defeat a polycentric organization of knowledge resources that better suit innovation and, ultimately, the general welfare.[25]

The critiques of Kenneth Arrow and Eric Maskin focus on the patent system's interference with the conditions that most successfully cultivate research among a community of investigators. A clear understanding of technologies and modes of scientific investigation challenge the durability of the traditional paradigm of the patent system as

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[23] *Individualism and the Economic Order* (Chicago: University of Chicago Press, 1948), 113-114. On the preference of rewards to state-granted monopoly see also Michael Polanyi, "Proposal on Reward Alternatives," *The Review of Economic Studies*, 11, No. 2 (Summer, 1944), 61-76.

[24] James Buchanan and Yong Yoon, "Symmetrical Tragedies, Commons and Anti- Commons," *Journal of Law and Economic* 43, no. 1 (April 2000): 11.

[25] Eli Dourado and Alex Tabarrok "Public Choice Perspectives on Intellectual Property," *Public Choice* (August 2014) accessed November 23, 2018 https://mason.gmu.edu/~atabarro/DouradoTabarrok%20PublicChoice%20IP.pdf.

protector of an inventor's investment from imitators. Their principal point is disarmingly simple: patents protect inventors from imitation, but the inventive process may require it. Patent rules do not effectively differentiate two fundamentally different modes of investigation. Maskin, for example, argues, "when innovation is 'sequential' (so that each successive invention builds in an essential way on its predecessors) and 'complementary' (so that each potential innovator explores a different research line), patent protection is not as useful for encouraging innovation as in a static setting." [26] Arrow, pursuing the same line of thinking, analyzes information as a commodity. He observes that in a free enterprise economy the profitability of the invention imposes a non-optimal allocation of knowledge resources by increasing their inappropriability and introducing uncertainty. "In the interest of the possibility of enforcement," he argues, "actual patent laws sharply restrict the range of appropriable information and thereby reduce the incentives to start inventive research activities." [27]

Others write as critics of neoliberal policy. Amartya Sen argues that internationally enforced patent laws are hostile to development and international public health.[28] Joseph Stiglitz, focusing on global institutions that aggravate inequalities, argues, "In general the private returns to innovation with intellectual property are not well aligned with social returns. More broadly, the link between stronger intellectual property rights and innovation

[26] James Bessen and Eric Maskin "Sequential Innovation, Patents, and Imitation," *The RAND Journal of Economics* 40, No.4 (2009): 611-635.

[27] Kenneth Arrow, "Economic Welfare and the Allocation of Resources for Invention" in *The Rate and Direction of Inventive Activity: Economic and Social Factors* (National Bureau of Economic Research, 1962): Ch. 11, 617, accessed November 23, 2018, http://www.nber.org/chapters/c2144.pdf.

[28] *Identity and Violence* (New York: Norton, 2006): 183.

is ambiguous at best."[29] "Inequality is not just morally repugnant but also has material costs. When the legal regime governing intellectual property rights is designed poorly, it facilitates rent-seeking — and ours is poorly designed."[30] Stiglitz's views reflect the appropriability dilemma for developing countries inherent in intellectual property rights in intangibles. Where an intellectual property right empowers a transnational corporate entity to control the distribution of knowledge and ways in which the local economy can absorb a technology, the development of a nation's labor power moves outside the control of state policy. Historians observe that defiance of patent rights can be instrumental in a successful national economic take off.[31]

Edmund Phelps, looking at institutional obstacles to individual agents, observes the problem of over-patenting that chokes inventors with litigation and other transaction costs,

> Now the economy is clogged with patents. In the high tech industries, there is such a dark thicket of patents in force that a creator of a new method might well require as many lawyers as engineers to proceed. [32]

These prizewinners from the Royal Swedish Academy provide a thermometer to measure the heated skepticism that mainstream economics, whose attentions range from libertarian public choice to microeconomic efficiency to global inequality, cast on the justifications for exclusive property rights in ideas.

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[29] Giovanni Dosi and Joseph Stiglitz, "The Role of Intellectual Property Rights in the Development Process with Some Lessons from Developed Countries," in *Intellectual Property Rights: Legal and Economic Challenges for Development,* ed. Mario Cimoli et al. (New York: Oxford 2014), 3.

[30] "How Intellectual Property Reinforces Inequality" *New York Times Opinionator*, July 14, 2013, accessed November 23, 2018 https://opinionator.blogs.nytimes.com/2013/07/14/how-intellectual-property-reinforces-inequality/.

[31] See generally, Hiroyuki Odagiri, Akiri Goto, Atsushi Sunami, and Richard R. Nelson, eds., *Intellectual Property Rights, Development and Catch-up: An International Comparative Study* (New York: Oxford University Press, 2010).

[32] *Mass Flourishing: How Grassroots Innovation Created Jobs, Challenge, and Change* (Princeton: Princeton University Press, 2013), 253.

B. The Fundamental Paradox of Patents

Natural resources such as forests and fisheries have tangible resource units that precede the social and economic regimes that control their exploitation. The patent system, by contrast, legally constructs resource units from inchoate and intangible knowledge, and those units are rationed under its activity-restricting rules. Resource scarcity arises from legal rules, not resource exhaustion. As economist Arnold Plant explained,

> It is a peculiarity of property rights in patents (and copyrights) that they do not arise out of the scarcity of the objects which become appropriated. They are not a *consequence* of scarcity. They are the deliberate creation of statute law; and, whereas in general the institution of private property makes for the preservation of scarce goods, tending... to lead us to make the most of them; property rights in patents and copyrights make possible the *creation* of a scarcity of the products appropriated which could not otherwise be maintained."[33]

Joan Robinson took the idea further saying, "The patent system introduces us to some of the greatest complexities in the capitalist rules of the game."[34] The professed justification of patents is a paradoxical contrivance: its logic makes scarcity and progress co-dependent.

> A patent is a device to prevent the diffusion of new methods before the original investor has recovered profit adequate to induce the requisite investment. The justification of the patent system is that by slowing down the diffusion of technical progress it ensures that there will be more progress to diffuse. Since it is rooted in a contradiction, there can be no such thing as an ideally beneficial patent system and it is bound to produce negative results in particular instances….[35]

Society's payoffs, according to this justification, are deferred, indirect, and uncertain. Even when the investor is gratified, social returns may be reduced.

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[33] Arnold Plant, "The Economic Theory Concerning Patents for Inventions," *Economica* 1, no.1 (February 1934): 36.

[34] Joan Robinson, *The Accumulation of Capital* (London; McMillan, 1956), 87.

[35] Ibid. 87.

Returning to Kenneth Arrow, his expression of Robinson's paradox of patents examines the resource, not the investor. "In a free enterprise economy, inventive activity is supported by using the invention to create property rights; precisely to the extent that it is successful, there is an underutilization of the information."[36] As a consequence of the capitalist rules of the game, "The profitability of the invention requires a non-optimal allocation of resources."[37] Arrow sees patents as suppressors of *demand* for the transmittal of valuable information, particularly for basic research,

> To appropriate information for use as a basis for further research is much more difficult than to appropriate it for use in producing commodities; and the value of information for use in developing further information is much more conjectural than the value of its use in production and therefore much more likely to be underestimated. Consequently, if a price is charged for the information, the demand is even more likely to be suboptimal.
>
> Thus basic research, the output of which is only used as informational input into other inventive activities, is especially unlikely to be rewarded. In fact, it is likely to be of commercial value to the firm undertaking it only if other firms are prevented from using the information obtained. But such restriction on the transmittal of information will reduce the efficiency of inventive activity in general and therefore reduce its quantity also.[38]

Patents also amplify conditions of uncertainty because they bar preliminary exploration that may identify all the pathways and roadblocks to new ideas or processes. The choices among the possible lines of investigation are made more uncertain; the less promising lines are more difficult to detect and eliminate.[39] When the production of information is vital, Arrow argues, the classic economic case in which the decentralized price system accurately and

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[36] Arrow, "Economic Welfare and the Allocation of Resources for Invention," 617.

[37] Arrow, 617 ("Whatever the price, the demand for information is less than optimal for two reasons: (1) since the price is positive and not at its optimal value of zero, the demand is bound to be below the optimal; (2) …at any given price, the very nature of information will lead to a lower demand than would be optimal.").

[38] Arrow, 618.

[39] Ibid.

efficiently supplants the detailed collection of information is no longer dependable. Optimization of a knowledge resource "would require an unrestricted flow of information among different projects, which is incompatible with the complete decentralization of an ideal free enterprise system."[40] Accordingly, so the argument goes, if strong patent rights dominate the management of discoveries, private enterprise will necessarily underallocate resources for invention against an optimal condition. From this it follows that transformational basic research, which does not predictably bear the fruit of commercialization, is unlikely to be rewarded in the free market, while research with commercial value requires the scarcity condition that patenting creates. [41]

For Arrow, the cure for the under-allocation of resources and waste, at least in areas of basic research, is not the polycentric organization of resources, as argued by the Virginia public choice theorists. For "optimal allocation to invention," Arrow contends, "it would be necessary for the government or some other agency not governed by profit-and-loss criteria to finance research and inventions."[42] Arrow's principal concern is patent system restrictions on transformational and disruptive technology—not the minor improvement of existing devices. To approach an optimal condition, resource allocation for basic research may depend on the steady underwriting by government or nonprofit institutions to overcome the uncertainties that private parties confront because of the inability to appropriate existing knowledge advances.[43] As discussed later, this government underwriting can take the form of direct funding or compensated appropriation by compelled licensing of previously

[40] Arrow, 619.

[41] Arrow, 617.

[42] Arrow, 623.

[43] Ibid.

granted patents.[44] Arrow observed, writing in the 1960s, that the operation of such alternative forms of research management were already realized in agricultural policy and aeronautics.[45]

To summarize: the scarcity-wealth co-dependence triggers three mechanisms of underutilization and underinvestment:

a) Hopeful inventors confront the uncertainties that promising inventions may not be clearly differentiated from existing patents and expose them to infringement and other legal blocks from patent holders;

b) Patent holders, qua monopolists, confront uncertainties about undertaking the risk of improving their inventions if their monopoly position already secures a revenue stream; return on investment in new capital expenditures for research may not enhance profits if their monopolies are secure; and

c) Basic researchers are unable to freely engage formal or informal networks of collaborative learning for sequential or complementary discoveries because the system blocks access to information or bars its use.

In the early 20th century the problem of inventor motivation inspired American utilitarian John Bates Clark to maintain that, absent patents, creative stagnation would ensue because potential inventors would be in "rivalry in waiting for each other" to undertake the risk of originating improvements.[46] While Bates was correct to point to the problems of uncertainty in undertaking research, he failed to observe that the patent was one of the

[44] Harold Demsetz argued against Arrow that alternative public organization of inventive activity can aggravate the conditions that it means to cure by absorbing the demand for information that the private system is capable of generating. "It is hardly useful to say that there is 'underutilization' of information if the method recommended to avoid 'underutilization' discourages the research required to produce the information." "Information and Efficiency: Another Viewpoint," *Journal of Law and Economics* 12, no.1 (April 1969): 11. Demsetz does not clearly state why Arrow's alternative will discourage research, especially since Arrow is focused on disruptive, transformational technology and sequential research. Demsetz appears to see Arrow arguing for public organization of all inventive activity generally. Demsetz may be over-arguing Arrow's case in order to knock it down.

[45] Arrow , "Economic Welfare," 623.

[46] John Bates Clark. *Essentials of Economic Theory* (New York: Macmillan Co.,1915), 360.

sources of uncertainty.[47] He was blinkered to the possibility that a holder's patents postponed the advancements of others. Arnold Plant wondered, "By what system of economic calculus were [utilitarians] enabled to conclude so definitely that the gain of any inventions [from patents] might not be offset by the loss of other output?"[48]

C. An Immanent Critique: Where Patent Practice Contradicts Patent Purposes

On top of the fundamental paradox of scarcity lies a knotty structure of practices that apply to the claims and liabilities that patent holders may enforce. Those practices expose contradictions between what patent rules purport to do and what they allow in subversion of those very purposes. Each of them creates resistance against diffusing the benefits of discovery or nurturing research. They impose competitive postures among inventors and enterprises. They are distilled here into what amounts to an agenda for non-cooperation:

- Privileging nonuse and nonworking;
- Displacing originating and concurrent inventors;
- Honoring conceptual invention over mature innovation;
- Closing patent-granting proceedings to comments from technical experts;
- Detaching investment recovery from revenue accumulation;
- Prohibiting experimental, noncommercial research; and

[47] John Stuart Mill argued earlier with indifference to these effects. In his *Principles of Political Economy* he opposed monopoly generally but allowed that the "condemnation of monopoly ought not to extend to patents [because inventions'] expenses and labours would be undergone by nobody except very opulent and very public-spirited persons, or the state must put a value on the service rendered by an inventor, and make him a pecuniary grant." Mill visualized patents from a consumerist individual and static, not societally dynamic position: the *only* peril of patent policy was its effect on the terms of purchases for individuals. The only public losses for Mill comprised the sum of postponed reductions of prices that members of the public would relinquish individually (and only temporarily) in order to reward a patentee. *The Collected Works of John Stuart Mill, Volume III - Principles of Political Economy Part II* (Book V, Chapter 10), 932, Liberty Fund: On-line Library of Liberty, accessed December 6, 2018, https://oll.libertyfund.org/titles/mill-the-collected-works-of-john-stuart-mill-volume-iii-principles-of-political-economy-part-ii.

[48] Plant, "The Economic Theory Concerning Patents for Inventions," p. 40.

- Generating transaction costs unrelated to the growth of knowledge.

1. Privileging Nonuse and Nonworking of Patents

Nonworking of a patent is privileged under United States law, and it does not disturb the patentee's rights of exclusive control, despite legal doctrines that sometimes characterize patents as public franchises. For example, the United States patent code secures nonuse of patents:

> No patent owner otherwise entitled to relief for infringement or contributory infringement of the patent shall be denied relief …. by reason of his having…(4) refused to license or use any rights to the patent.[49]

By contrast, nonuse of a trademark for three years constitutes prima facie evidence of abandonment that results in a loss of rights.[50] As a general rule, as long as periodic fees are paid, the patentee has no obligation during the term of the patent to defend the management of the patent before the patent office. Public regulatory institutions have no preemptive or proactive responsibility to prompt the use of the patent. The holder can put a patent into hibernation; absent special statutory exemptions, competitors and the community of researchers have no individual standing to demand a license. Nonworking can be good business: it can secure positions against new market entries while the holder defers costly improvements for as long as the monopoly secures its revenue streams.

A 1908 landmark case, *Continental Paper Bag Co. v. Eastern Paper Bag Co.,* formed the policy and justifications of nonuse that were subsequently fixed into the legislation quoted above. The Supreme Court, in examining nonpractice as a defense to an infringement claim, declared, "the inventor [is] one who has discovered something of value" which, in turn, makes

[49] 35 U.S.C. 271(d)(4).

[50] 15 U.S.C. 1127.

it "his absolute property."[51] Accordingly, the holder maintains "the privilege of any owner of property to use or not use it, without question of motive."[52] Moreover, *Continental affirmed* that rights of nonuse were transferable to non-inventors who purchased a patent. [53] Notably, when the American doctrine of nonworking of patents was formulated in 1908, international jurisprudence was not in harmony with that doctrine. International law under the 1883 Paris Convention on Industrial Property authorized, but did not require, its member nations to allow individual petitions to penalize patent holders with forfeitures for "insufficient working" after four years of complete dormancy.[54] The convention also allowed accused infringers to raise nonuse as a legal defense. The United States, despite it membership in the convention, has avoided imposing a duty to "use or lose" a patent. It is important to note, however, that strong constitutional protection of a property title for inventions does not disable Congress from appropriating public uses of private intangible property with provisions for compensation—just as it may for land. In such cases an unused patent may be worth only nominal compensation. Subject to the various considerations of compensation, the legal elements of patent protection never guarantee an implacably fixed constitutional right to hold an unused

[51] Continental Paper Bag Co. v. Eastern Paper Bag Co., 210 U.S. 424 (1908).

[52] Continental Paper Bag at 429.

[53] The story of the case: Eastern Paper Bag purchased a patent (invented elsewhere) for a machine to efficiently form paper bags, but it declined to use the new technology or license it to others. Purchasing the patent and suppressing its use protected its sunk costs for the machines it was then operating and prevented others from cutting into its revenues by offering lower prices resulting from better productivity with the new techniques. When Continental used a machine that arguably infringed on Eastern's purchased patent, a trial court enjoined Continental from using the machine and the Supreme Court affirmed the injunction despite Eastern's practice to withhold licensed use of the patent by anyone in the industry. Such a withholding was not an unfair trade practice under the rule of this decision.

[54] Paris Convention, Article 5(A)(4). Under the 1994 WTO TRIPS treaty, international rules that allow states to create laws that provide for forfeiture for nonuse (and many do) are weakened. Derogation of patent rights for nonuse requires direct state intervention on highly limited grounds subject to several protections for the holder. See TRIPS, Article 31.

patent, nor confirm limitless privileges of nonuse, nor immunize patent holders from statutes that modify a patent monopoly. [55]

Still, a privilege of nonuse has been pointedly questioned from time to time. In 1956 the Senate Judiciary Committee commissioned studies and held several hearings on proposals to curtail patent exclusivity and probe the *Continental* doctrine that protected nonworking. Vannevar Bush, organizer of the National Defense Research Committee during World War II and, informally, the dean of American engineering and scientific research at mid-century, advised the committee,

> The patent system did not contemplate a complex industrial society under which it might be not only possible, but financially advantageous, for a limited group to purchase patents and withhold from the public the benefits of new inventions…. The individual should have freedom in the use of his property, but a patent is a special type of property and is peculiarly subject to considerations of public interest. Neither the cross-licensing, nor the acquisition, nor the retention of patent rights should be allowed to proceed to the point where something which the public wants… is artificially withheld."

The doctrine of nonuse, following *Continental,* purported only to place intangible patent property on an equal footing with corporeal property forms, but in practice it can often amplify privileges beyond those applied to the corporeal forms. For example, in regard to real property, abandonment or inattentive nonuse triggers a change of possessory rights under doctrines of prescription or adverse possession that may be invoked to deprive owners of possession when their neglect extends for an uninterrupted statutory period. (Under state laws

[55] Article I, §8 of the Constitution enumerates among other powers, Congress' ability to design and enforce a patent system with personal and exclusive rights, and, by extension, it empowers Congress to modify, rebuild, or eliminate its own system. As the Supreme Court observed in 1966, "The Congress may, of course, implement the stated purpose of the framers by selecting the policy which in its judgment best effectuates the constitutional aim." Graham v. John Deere Co., 383 U.S. 1,6 (1966).

in the U.S. the period varies from seven to 20 years).[56] Someone who is deemed to abandon property (real or personal) may be disabled (or estopped) from obtaining an order to recover possession from a person who has appropriated it or received the property from the appropriator.[57] The common law's doctrines of prescription recognized implied social obligations of ownership—that nonuse and neglect of land can cause waste, blight or interferences with the uses of nearby property.[58] An innocent user or one who seeks improvement of unused or abandoned land for the security of its own interests can move to recognize her private interest in the titled property of another party. By contrast, an innocent infringer of a patent is highly disfavored and can face forfeiture of her investments when confronted by legal action by a nonusing patent holder

Nonuse is raised to a high power of arbitrariness when patent brokers (ventures that purchase inactive patents of varying quality in active industries) and other non-practicing entities (NPEs) stockpile patents, which might be used to assert infringements against active enterprises, perhaps including a petition for an injunction. Developers may face ambush by NPE allegations, yet unproved, that can put their business plans under a cloud, make them less attractive to venture capital participation, and force them to settle threatened lawsuits. That process may culminate in a license from the NPE, which in reality is payment for the "right" not to be sued. It is sarcastic to call this a "license" if the licensor, in practice, gives

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56 On adverse possession and prescriptive rights in the American law of property generally see Dukeminier, Krier, et al., *Property, 6th Ed.* (New York: Aspen, 2006), 112-139.

57 Eduardo Penalver, "The Illusory Right to Abandon," *Michigan Law Review* 109, no. 2 (2010): 1196.

58 The doctrine of prescription had conservative and progressive justifications to bring legal interests into conformity with concrete, historical uses (e.g., Burke's idea of a presumption in favor of settled usages). Legal control should be in harmony with the active land uses.

up nothing other than the continuation of a legal action.[59] These types of NPE tactics can also be brought against new enterprises whose operations are too fragile to deal with the financial and administrative costs of prolonged litigation.[60] The doctrine of nonuse capsizes the tragedy of the commons associated with the overuse of common tangible property. Instead, NPE claimants with little interest in the diffusion of a technical art trigger a tragedy of the anti-commons and cause underuse when their threats block the use of knowledge resources.[61]

2. Displacing Original and Concurrent Inventors

From the applications that are submitted and its own search of records, the patent office determines that an invention is novel and has not been anticipated by prior art—either by publications or as a result of devices and methods existing in the commercial stream. These requirements, however, do not protect concurrent or previous inventors when they develop a similar or identical idea independently and work without knowledge of the applicant's work.[62]

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[59] See Oscar Liivak and Eduardo Penalver, "The Right Not to Use Property Patent Law," *Cornell Law Review* 98, no. 6 (2013): 1437.

[60] From a large library of discussions of the weaponization of patents by NPEs see James Bessen and Michael Meurer, "The Direct Costs from NPE Disputes," *Cornell Law Review* 99, no. 2 (2014): 397-424.

[61] Michael Heller, "The Tragedy of the Anti-Commons: A Concise Introduction and Lexicon," *Modern Law Review* 76, no 1 (2013): 6-25; also Michael Heller and Rebecca Eisenberg "Can Patents Deter Innovation? The Anti-Commons in Biomedical Research," *Science* 280, no.4364 (1998): 698-701. For additional sources and studies on the problem of nonused patents and examples of their capacity to suppress technology see, Kurt M. Saunders, "Patent Nonuse and the Role of Public Interest as a Deterrent to Technology Suppression," *Harvard Journal of Law and Technology* 15, no. 2 (2002): 389-450.

[62] Here is a major difference between copyright and patent. Independent creation of the same subject matter for creative work subject to copyright is a defense against infringement. To be liable under copyright one has to copy (reproduce) the work, not generate it. Under copyright law multiple substantially similar works do not violate copyright, provided that each has been created independently. While the legal theory of copyright draws a bright line boundary to protect independent creation, in practice the matter becomes fuzzy; factual determinations regarding the circumstances of creation and the similarity of the works being compared can become obscure, especially with regard to musical creations. From a theoretical point of view, however, the secondary independent creator is not legally disfavored, as he may be in patent proceedings.

In such a case, the inventor, who was without an intention to infringe, cannot use the device or method without liability for infringement. The prejudice to non-filing inventors or concurrent creators can be harsh. One who delays the filing of her own independent, originating claims may become liable even after perfecting an invention far beyond the efforts and conceptions of a successful first filer. Nor do the regulations insulate the inventor or enterprise that has perfected a technical art while conscientiously attempting to maintain trade secrecy.

The patent system gives its rewards, not just for acts of creativity, but also for the initiative taken in asserting the patent itself. Acceptance of the patent requires the patentee to reject trade secrecy and put her invention on file at the threshold of the public domain; others may peek from the doorway but are barred for the patent term from practicing the specified art. It is the initiative to file the patent, not the initiative of research and creativity, which is the critical final step that *legally* secures the privileges of a patentee. As a result, some originating or independent inventors can suffer the same prejudice that befalls a conniving, infringing imitator.[63] Infringement is a strict liability offence that occurs regardless of intent. While these originating inventors did not offer their specifications for publication, neither did they seek to constrain the research and development of others. Nevertheless, a successor developer can trump an originating inventor who choses to manage his discovery by secrecy. If an invention is not already being used or sold in public, the administrative actions of the party who gets to the patent office earliest, with properly prepared claims and drawings, prevails.

[63] Users of long-standing trade secrets may have good defenses against infringement by virtue of their devices and methods being used and sold in commerce, but such defenses may be unavailable to those with research in progress or those whose devices and methods are new market entries. Successful infringement claims test the validity of a patent. To overcome the patent's presumptive merit the accused infringer has the burden to show that the inventive steps documented in the patent would be obvious to generally skilled practitioners or that the inventive steps were not novel because they were either documented by other patents or publications or, alternatively, embodied in actual sales or uses in commerce. See 35 U.S.C. §§102, 103.

The privileged regard for first-filers has roots in the 18th century legal rules that favored timely filers over prior inventors. Lord Mansfield in *Liardet v. Johnson* (1778)[64] declared an inventor's earned right to reap what he sows but elaborated what the law would recognize as the "sowing." It was the *social undertaking* of filing drawings or patent specifications at public offices (not idea creation) that constituted the "sowing" and validated the grant. This doctrine underlined Mansfield's previous decision that had curtailed the legal importance of being an originating inventor when recognizing a patent. In *Watkin v. Dollond* (1763-64)[65] Mansfield had made a finding that a Mr. Hall was the first to perfect a process to make an achromatic telescope, an invention that Isaac Newton said would be impossible to fabricate. Mansfield, nevertheless, upheld the patent of Dollond, a subsequent fabricator, who formally sought the grant with the appropriate submittals. Mansfield ruled that the patent must be assigned to the party that conveyed the benefit of a public disclosure of the inventive process. Mansfield's ruling was an occasion to construct a policy—to discourage secrecy, by maintaining a rule that the commercial system will work best if diligent inventor-investors are able to know from published specifications when they are crossing a line into another party's efforts. In a recent account of this policy consideration, a leading American patent jurist has said, "As between a prior inventor who benefits from a process by selling its product but suppresses, conceals, or otherwise keeps the process from the public, and a later inventor who promptly files a patent application from which the public will gain a disclosure of the process,

[64] 62 Eng. Rep. 100, 1780 (Kings Bench).

[65] No case report appears to exist. Other cases vouch for the meaning and authority of the case. The story of the case is set out by Richard Sorrenson, "Dollond & Son's Pursuit of Achromaticity, 1758–1789, *History of Science* 39, no. 1 (2001): 31-55.

the law favors the latter."[66] One way to characterize the Mansfieldian view is that by means of the patent system, society takes custody over trade secrets and then franchises them back exclusively to the patent applicant—the patent becomes an imputed form of public procurement contract by which society acquires trade secrets for eventual redistribution to the public after the termination of the franchise term.[67] What about disputes that may occur before the patent office issues a grant? For many decades, in any contest between competing patent applicants United States law uniquely gave priority to the first person to invent rather than the first person to file an application. No longer. Under recent law the first filer wins the pre-grant dispute, too.[68] But even under that old, now superseded pre-grant system, a tardy or neglectful inventor who relied on trade secrecy could not subsequently challenge the successful patent grantee that made a patent disclosure to the public. The trade secret, or non-informing use, was legally disadvantaged under the code then, as it is now.[69]

A complete treatment of the prejudice to non-filers requires observation of a narrow exception: an exception that illustrates the strength of the principal rule against concurrent and independent inventors who fail to file or file late. In 2013 the code recognized the equities of a highly limited "prior user rights defense" that can protect, *in part*, the party that was first to use a device or method that is subsequently patented. Accordingly, a person who chooses not to file for a patent because she opted for secrecy or thought the idea was unworthy of a patent,

[66] Opinion of Howard Markey in W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1550 (Fed. Cir. 1983)(CJ Markey).

[67] See the U.S. Supreme Court's newly minted support for this narrative in Oil States Energy Services, v Greene's Group, discussed in the Introduction, A.2.

[68] The United States moved to a first-to file system, effective in March 2013, under the Leahy-Smith "America Invents Act." which had been passed two years earlier.

[69] Gilman v. Stern, 114 F.2d 28, 46 (1940) (J. Hand).

and who also used a device or method for one year, has a restricted defense in an infringement suit for some non-transferable commercial uses within her own facilities that are ongoing at the time of the action. [70]

Notwithstanding recent limited recognition for prior-using inventors, it remains the case that a system designed to incentivize invention by protecting the recovery of investment leaves a canyon of risk for the inventor-investor who, for sound business reasons, may rely on secrecy for the very same end. If one allows that the policy of rewarding publication of specifications more than creative origination has merit, then one also accepts that the system, in practice, abandons much of its pretense of prioritizing invention origination. This fact attenuates the force of arguments that patents are essential for motivating origination.

3. Honoring Concepts Over Mature Innovations

Patent rights do not depend on how a new technical art came to be conceived or discovered. [71] The patentable idea may be stumbled upon accidentally or developed with negligible investments in time or material. Nor must an applicant develop physical prototypes or make a showing that she has brought ideas to the threshold of commercial use. While validation of an invention by demonstration in physical and tangible forms (called "actual

[70] 35 U.S.C. §273 (a) (Defense Based on Prior Commercial Use). The new provisions still maintain asymmetrical advantages for the first filer, however. The prior user avoids infringement only so long as it does not assign, license, or transfer the device or methods to other parties. Continuing uses are restricted to sites that are active before the patent filing date. Future contracting relating to the technical art is barred. Hence, the prior use defense will not cover expanding business operations.[70] The defendant must prove eligibility for prior use protection by clear and convincing evidence (a high standard of proof beyond the "mere preponderance" standard applicable in most civil litigation).[70] The defendant asserting the defense will be subject to intensive discovery into its business operations, which may cause exposure to new, related infringement liabilities and expose other competitively disadvantageous data. The burden of waging a viable defense can be worse than suffering the infringement charge.

[71] "Patentability shall not be negated by the manner in which the invention was made." 35 U.S.C. 103 (Conditions for Patentability).

reduction to practice") is technically allowed, patent law and practice today recognizes a "constructive reduction to practice," which signifies that the applicant's claims and specifications will fully explain to skilled technicians how to practice the claimed invention. Reduction to practice does not require immediate readiness or suitability for commercial development.[72] The application shall ordinarily meet only textual requirements described by the code, not physically embodied ones.[73]

The first iterations of patent laws in 15th century Europe granted monopolies for finished innovations—that is, for discoveries comprehensive and mature enough to bring industrial applications to the state's commerce. The City of Venice Ordinance of 1474 targeted devices that enabled new major commercial enterprise.[74] Similarly Britain's Statute of Monopolies of 1624 knocked down an array of special royal privileges for patenting, but preserved, under parliamentary control, those monopolies capable of causing "new manufacture within the realm."[75]

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[72] 35 U.S.C 112. Canadian legislation recently attempted to revise that country's standard for reward of a patent requiring representations of the realistic *promise* of innovative *implementation* within the patent term ("The Promise Doctrine"). These representations could be used post-grant to test the validity of the patent. The successful applicant would illustrate pathways to innovation before the inventive idea could initially attach to exclusive use rights. Such a move was meant to discourage the accumulation of patents, whose utilities are speculative at the time of filing and can be used to block competing research efforts if granted. The doctrine particularly targeted drug patents that are often granted on chemicals whose efficacy is speculative at the time of application. But the Supreme Court of Canada unanimously rejected the promise doctrine, finding the doctrine unworkable as codified. On the controversy, see Steve Brachmann, "Supreme Court of Canada rules on Promise Doctrine in favor of Pharma Patent Owners," *IP WatchDog,* July 6, 2017 accessed January 8, 2019, http://www.ipwatchdog.com/2017/07/06/supreme-court-canada-rules-promise-doctrine/id=85420/ .

[73] 35 U.S.C. §112. As an exception the patent office can *require* submittals of samples when the patent is for a "composition of matter." 35 U.S.C. 114.

[74] Venice Ordinance of 1474. A text can be found in Ikechi Mgbeoji, "The Juridical Origins of the International Patent System," *Journal of the History of International Law* 5 no.2 (2003): 413.

[75] Statute of Monopolies of 1624. For text and commentary see Chris Dent, "Generally Inconvenient: The 1624 Statute of Monopolies' as Political Compromise," *University of Melbourne Law Review* 33, no. 2 (2009): 441-442.

Today, however, inventors who succeed in showing bare physical feasibility, but whose capacities to engineer, organize, finance, and otherwise drive an outcome are slim, may create stakeholds on future enterprises known or unknown to them. Likewise, a holder of a dormant patent, including one that an inventor was never able to translate into a mature device or process, can intervene and assert that subsequent and more sophisticated devices are conceptual improvements that were anticipated by his unused patent. In the United States a patent is granted unless the patent act precludes approval. This is simply a way to express the patent office's burden to explain the failure of an application under statutory criteria. Under modern law the office validates textually expressed conceptual claims amplified by drawings and specifications showing that the concepts *can* work as intended. Hence, according to the law, an expression in the application showing "formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, *as it is hereafter* to be applied in practice" can support favorable action. [76] Once approved, patent office actions enjoy the legal presumption of validity.[77] The Supreme Court has held that when statutes create such presumptions, the party seeking relief must prevail under a standard of clear and convincing evidence.[78] Accordingly, mere susceptibility to becoming useful may meet the threshold for a highly protected privilege of exclusivity ahead of more patiently developed,

[76] Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367,1376 (Fed. Cir. 1986)(Emphasis added) (quoting 1 *Robinson On Patents* 532 (1890). For a similar formulation see Fiers v. Revel, 984 F.2d 1164,1169 (Fed. Cir. 1993) (A patentable idea is definite and permanent when the inventor has "a specific, settled idea, a particular solution to the problem at hand, not just a general goal or research plan he hopes to pursue.").

[77] 35 U.S.C. §282(a).

[78] Applied, for example, in actions to invalidate patents in *Microsoft Corp. v. i4i L.P.,* 131 S. Ct. 2238, 9 June 2011. Under 35 U.S.C. § 282, a patent is presumed valid, and the one attacking validity has the burden of proving invalidity by clear and convincing evidence. Clear and convincing evidence signifies that the reviewing authority has a firm conviction in its factual determination, not merely a belief that its conclusion is more likely than not, which is the customary standard of review for judges or juries in civil matters.

mature embodiments of the technical art. An applicant who has no collaborative plan or means to perfect the application for commercial use may block more advanced practice of the art.

4. Closing Applications for Patents and Limiting Post-Grant Review

The patent office reviews and approves applications in a closed process. Where a patent is filed only domestically, that is within the United States and in not in other country, the filing is held confidentially throughout the examination process.[79] Where additional non-domestic filings occur, the patent office holds an application secret for a minimum of 18 months after its filing.[80] Both modes of review can support non-cooperative strategies by applicants. Under the closed process applicants establish provisional rights before the patent office determines validity. The secret approach allows an applicant to learn the extent to which its claims may be allowed by patent examiners. If an applicant is disappointed it may choose not to secure the patent and instead exploit trade secrecy to the extent possible. On the other hand, parties who have made commitments to engage in research and development in the same technology may be without notice that another party has already staked a claim and can be poised to assert infringement against unwary competitors upon approval of the application. When prospectors mine for minerals, they work in a designated plat that clearly reserves public land for the benefit of the private party.

[79] 35 U.S.C. 122(a) provides "… applications for patents shall be kept in confidence by the patent and trademark office and no information concerning the same given without authority of the applicant or owner unless necessary to carry out the provisions of an act of Congress…"

[80] The 18-month rule is internationalized under a 1970 Patent Cooperation Treaty (PCT). Under the conforming U.S. rule, "Each US national application for a patent… will be published promptly after the expiration of the period 18 months from the earliest filing date for which benefit is sought under Title 35 [the patent code]" unless the applicant certifies it will not be seeking a patent in a foreign country that requires publication after 18 months. In the latter case the application may be held in secret until examination is complete. 35 U.S.C. 122 (b).

But patent applicants use a stealthier process to stake claims. The confidentiality process means that the examination of claims of invention is "ex parte"—without public notice and opportunity for adversary comment. The public is deprived of notice as to who is attempting to claim certain rights and whose rights may already be limited by the pendency.

The Supreme Court observed, "A patent, in the last analysis, simply represents a legal conclusion reached by the Patent Office. Moreover, the legal conclusion is predicated on factors as to which reasonable people can differ widely. Nevertheless the Patent Office customarily reaches its decision in an ex parte decision, without the aid of the arguments that could be advanced by parties interested in proving patent invalidity."[81] As a result, important data that can challenge patent validity will often be in the hands of competing practitioners rather than the patent office, whose examiners' technical knowledge can fail to match the best practitioners of the art. Moreover, examiners do not necessarily have the best grasp of pertinent publications that precede the submittal, nor are they aware that processes that purport to be novel may already have been embedded in commercial articles. As a practical fact, patent lawyers, often trained in a technical art and using former patent examiners as consultants, apply their resources to prepare applications that attempt to omit data that would over-educate competitors about how to put an invention into practice. They search for a thin line between disclosure and opacity. The most valuable patent asset will be the one whose disclosures are clear, *but incomplete*, insofar as they will leave elements of the invention unexplained.

Competing enterprises are not the only ones affected by the opacity of the patent-

[81] Lear, Inc. v. Adkins, 395 U.S. 653, 670 (1969).

granting process. The missions of federal agencies are affected by thinly developed decisions on patent validity. In a recent case involving patents of genetic discoveries, the amicus brief filed by the U.S. government observed:

> The extent to which basic discoveries in genetics may be patented is a question of great importance to the national economy, to medical science, and to the public health. This appeal consequently implicates the expertise and responsibilities of a wide array of federal agencies and components, including the [PTO], the National Institutes of Health, **…** the Antitrust Division of the Department of Justice, the Centers for Disease Control and Prevention, the Office of Science and Technology Policy, and the National Economic Council, among others.[82]

As the argument suggests, a system of closed prosecution of patent applications can hinder the policymaking functions of other institutions of government by advancing private rights before the public and its agencies can intervene with challenges and policy concerns.

To decide if an application is an advance over prior art, patent examiners must make a judgment under statutory standards for novelty and *non-obviousness.* A patent application fails under the non-obviousness criteria if "the differences between the subject matter sought to be patented and the prior art are such that the claimed invention as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."[83] Examiner judgments on the capacities of ordinarily skilled practitioners may lack awareness of the progress of the art without access to specialist practitioners in competitive enterprises who cannot maintain a patent watch while applications are behind the curtain of confidentiality. The closed system does not

[82] Brief for the United States as Amicus Curiae in Support of Neither Party in Association for Molecular Pathology v. U.S. Patent & Trademark Office (Myriad II), 653 F.3d 1329 (No. 2010-1406), cited by Arti K. Rai, "Patent Validity Across the Executive Branch: Ex Ante Foundations for Policy Development," *Duke Law Journal* 61, no. 6 (March 2012): 1241.

[83] 35 U.S.C. §103(a) "Person having ordinary skill in the art" yields the trade art acronym "PHOSITA."

bring those expert comments into administrative deliberations on the application.[84] Open prosecution alternatives can be devised to inject the best knowledge resources on the decision to grant a patent.[85] These will be treated later.

5. Detaching Investment Recovery from Research Cost: Excessive Rent

Monopolized patent rights can afford the holder the tools for extraordinary surplus accumulation. The holder's rewards from a patent impose losses for society until others can co-occupy the market. A successful patentee, as monopolist, can enjoy unlimited right to rents during the patent term, to the extent that the market will support them. The cost of research (which may range from substantial to negligible) is not a limit to the end prices charged or the revenue to be accumulated during the patent term. Recovery of investment costs is argued to be a fundamental justification of the patent system, but society bears the deadweight losses of monopoly exceeding such recoveries, and the research community is burdened with restrictions and uncertainties because of the holder's exclusive rights.

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[84] Observers of the patent examination process argue that the patent office lacks expertise in many areas of cutting edge research and that more knowledgeable examination would have filtered and rejected many patents. See Mark A. Lemley, "Rational Ignorance at the Patent Office," *Northwestern Law Review* 95, no 4, (2001): 1495. (Discussing proposals that the patent office recruit experts from the public as private examiners and empower the patent office in certain instances to assess a bounty against applicants whose patents unreasonably failed to account for prior art in the judgment of the specialists.).

Also, John R. Thomas, "Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties," *Illinois Law Review* (2001): 305.

[85] U.S patent law expanded the opportunity for post-grant challenges to patent office approvals in 2013 revisions to the patent code.[85] Previously, a challenger could identify *published* prior art to defeat the patentee's claim of novelty and move the patent office to defeat the grant. Today's post-grant challenges provide a short-term window for challenges on all the grounds under which a patent maybe granted. The new procedures for post-grant review continue to deprive the community of a well-informed patent watch *during* the application process and, accordingly, give incomplete protection to the ongoing business activities of non-filing competitors. The new post-grant administrative reviews may provide challengers with a better and timelier forum than civil litigation where a defendant, after using an invention, must challenge patent validity to avoid infringement liability. Although the reviews are far from optimal, the patent officers who review challenges have more expertise than a post-grant jury pool in a civil infringement case. This post-grant administrative process was the trigger of controversy over characterizing patents as public franchises in the *Oil States Energy* matter discussed in the Introduction (A).

As a practical matter, however, well-established cost accounting principles and practices would allow the real cost of invention to be observed in the holder's books and records—thereby establishing a basis for limiting the term of a patent's privileges by terminating the monopoly when costs are recovered. As a matter of law, however, the costs to be recovered are imputed to be the equal of whatever a patentee may recover from exploiting exclusive privileges during a full statutory patent term. In other words, the patent system makes no practical distinction between the objective of recovering investment and perpetuating a revenue stream, although the former is commonly cited as the justification for monopoly privileges.

This disconnection between research costs and revenue has been theorized to cause a threat to world health.[86] The Report of the United Nations Secretary General's High Level Panel on Access to Medicines explains how "market driven R&D" and its associated drug patents fail to deliver new health technologies and medicines for the world's serious acute diseases. The most urgently needed medicines, such as new antibiotics for acute illness, do not yield the high returns that are promised by specialized drugs for chronic ailments; a successful course of medication for an acute disease limits the drug's revenue stream. The prevailing business models, according to the analysis, divert pharmaceutical research from the widest needs and toward the greatest receipts. The panel recommended organizing a binding international R &D convention for government coordination and financing of medical device and pharmaceutical technology. Its stated purpose is "to delink the cost of

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[86] See "The Report of the United Nations Secretary General's High Level Panel on Access to Medicines " (September 2016), p. 31ff., accessed November 23, 2018, http://www.unsgaccessmeds.org/final-report/ .

See also, Balasegaram, M., et al. "A Global Biomedical R&D Fund and Mechanism for Innovations of Public Health Importance." *PLOS Medicine* 12, no. 5 (May 2015), accessed February 2, 2019, https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001831.

research and development from end prices" by creating a new mechanism for the creation of essential medicines.[87]

6. Prohibiting Experimental, Non-Commercial Research

The right of sole use of a patented device or process stands firm against noncommercial and experimental researchers (e.g., at a university), who are not exempt from restrictions. U.S. case law once provided that "an experiment with a patented article for the purpose of gratifying a philosophical taste or curiosity or for your amusement is not an infringement of the rights of the patentee."[88] This defense against infringement has little remaining applicability under current rulings. For example, research centers and universities are restrained under the patent system, regardless of their nonprofit tax status. The strictures characterize universities as businesses even when specific research experiments are unrelated to a commercial end or are used to investigate basic principles of physics or biology.[89] Where copyright law has provided a doctrine of fair use to allow sharing, consideration, and discussion of protected material, there is no equivalent opening under patent law for pre-authorized tinkering with and testing of a device. Prototyping device improvements in anticipation of the patent's expiration, without permission, is also barred. In many areas of

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[87] The panel's analysis of patent-directed market forces working against the optimization of knowledge development illustrates the concerns of the earlier cited 1962 work of Kenneth Arrow on resource allocation for invention.

[88] Poppenhousen v. Falke, 19 F.Cas. 1048,1049(1861).

[89] Madey v. Duke University (301 F.3rd 1351) (2002). The Supreme Court denied certiorari 539 U.S. 958, 2003). In this case university researchers attempted to rely on an experimental use exception to operate specialized laser equipment in its laboratory. The university argued that as a nonprofit educational institution its uses were noncommercial and supported the goals underlying the patent power. The court rejected the argument in this landmark decision. It characterized the university as a business, despite its nonprofit status by observing that "These projects unmistakably further the institution's legitimate business objectives…for example, to increase the status of the institution and lure lucrative research grants…. The profit or nonprofit status of the user is not determinative." Madey at 1362.

technology the economy's assimilation of advances is capable of moving faster than a 20-year patent term. Discouraging experimental work can kill the incentives to undertake research that relies on a patented idea. Theoretically, a holder could commission work to advance patentable improvements that would yield rights beyond the initial patent term and also evergreen the old patent by contracting for development of downstream improvements. But the holder may only wish to extend its monopoly and have no incentive to implement improvements. Moreover, the bar on experimentation makes it difficult for prospective licensors to locate capable prospective licensees before committing to joint development. In these ways, the bar on experimentation makes for poorly informed choices. A small opening for experimental use has appeared for some pharmaceutical and medical applications to give room for the development of data to be used for the approval of a generic drug after the expiration of a patent.[90] This exception, however, supports only distributions of existing discoveries in a limited domain and does not generate significant new advances.

7. Causing Excessive Transaction Costs

Over and above the costs of research and development, patents impose costs that a patentee may incur himself or shift to the marketplace, as well as the costs of the patent bureaucracy and courts.

a) Costs—legal and administrative— of patent prosecution, including claim definition, applications, and appeals to patent offices on claim validity;

[90] Congress has provided that generic drug makers could be exempt from infringement when they experiment to perfect bioequivalents of patented drugs, so long as no derived data is submitted to the drug-approving agency until the expiry of the patent. The Drug Price Competition and Patent Term Restoration Act of 1984, also known as "Hatch-Waxman," codified at 35 U.S.C. 271(e). If a generic maker's activity goes towards the development of an independent pioneer drug, infringement protections may kick in. Integra Life Sciences I Ltd. v. Merck, 991 F2d. 808 (Fed Cir 1993).

b) Costs—legal and administrative—of market surveillance by patent holders to detect infringement and by potential users to identify vulnerability to infringement claims by holders;

c) Costs of legal actions against infringement and infringer defense costs;

d) Negotiation, computation, assessment, and management of licenses and royalties;

e) Costs of "inventing around" when firms are forced to reconfigure parts and designs to make them less vulnerable to infringement challenges; unrecovered research expenses from losing the race to the patent office against competing firms;

f) Estimated deadweight loss for consumers from patentees' monopoly pricing; and

e) Tax sheltering and accounting mischief.[91]

The dense regulatory framework of patents and its specialized vocabulary conceal simple and basic contradictions. A deep cultural commitment to the idea of patenting obscures these contradictions. Anthropologist Mary Douglas observes that "institutions create shadow places" and "thought tunnels," that occlude the public's collective vision and can conceal the important questions to be asked about the space between an institution's origins and practical operations that evolve from them.[92] So it is with the patent system. Rules that

[91] *Patents as capital assets and tax shelters.* Patentees can use patents to make incidental and derivative claims once the patented idea is titled to its owner. Patentees may treat their patents as asset values and tax shelters. Revenue streams from licensing royalties and forecast revenues become part of asset valuations in acquisitions and part of share values trading on exchanges. Companies that are organized as multiple business segments may use patents as tax shelters when they assign patents to their own foreign affiliates. Hence, one affiliate will pay royalties to another in a tax-favored jurisdiction, at rates set internally; the former will expense those costs to make them nontaxable, while the latter may avoid taxation altogether or pay a lower rate under the affiliate's foreign law. Functional operation of the patent system in these respects diverges from the genetic origins of the instrument. Additionally, depreciation values for a patent on the books of account are not always tested in the market and surveillance is slack. Patent depreciation generate losses with which to reduce taxable profits. An enterprise can accumulate value with these uses of the patent that are unrelated to the investment risks that gave rise to the patent grant and to the original, social purpose of patent protection.

[92] Mary Douglas, *How Institutions Think* (Syracuse NY; Syracuse University Press,1986), 69. Relatedly, to borrow words from sociologist Claus Offe, inattentive publics come to rely on an "institutional system built on regulatory legislation that exonerates them from reflecting on the extent of the responsibility for what they

created strategic advantages for a patent holder, result in the obscuring of the disabilities imposed on non-holders. The practices enumerated should lead to serious questions about the logic of strong patent rights, as they have evolved.

D. A Taxonomy of the State's Controls Over the System

A formal property title—whether for physical or intangible property—negates the claims of non-holders over a resource. A title protects an individual's wealth, but only if its holder can call up the collectively adopted facilities of the state to defend it. A title, therefore, is a structural allowance that the collective extends to an individual.[93] Whether lawmakers justify their rules with ethical or strategic reasoning, it is a community that adopts the rules to authorize a holder's privileges.[94] Such power is never in the possession of the individual; "it belongs to a group and remains in existence only so long as the group keeps together." [95] Durkheim observes the constructed and contingent nature of private property rights generally, where each governing domain (early or modern) must stamp private right with indicia of sacredness. "[Each] private appropriation pre-supposes an initial collective appropriation….

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do." Bindings, Shackles, Brakes: On Self-Limitation Strategies," in *Cultural Political Interventions in the Unfinished Project of Enlightenment,* Axel Honneth, ed. (Cambridge, MA: MIT Press, 1992), 86.

[93] *Professional Ethics and Civic Morals*, (London, Routledge, 1992): 161. In the 19th century, a *foreign* patent simply lacked such a collective's private stamp; it could belong to everyone outside nation of the patent's origin. The Paris Convention of 1883 changed that by granting foreign nationals the privilege of standing to apply for, receive, and enforce a patent. The convention (under the lights of Durkheim's maxim) could be said to have sacralized the international status of "the inventor" as a private holder across the borders of signatory nations.

[94] See A.M. Honore, "Property, Title and Redistribution" from Carl Wellman ed. *Equality and Freedom* (Stuttgart: Franz Steiner Verlag GmbH, 1977); also Melville J. Herskovitz, *Economic Anthropology* (New York: Norton 1965) 313-331.

[95] Hannah Arendt, *On Violence* (New York: Harcourt Brace,1970), 44. See also Rainer Forst on "Noumenal Power" in *Justification and Critique: Towards a Critical Theory of Politics* (Cambridge, U.K.: Polity, 2014), 3-13. ("Power plays out in a space of reasons, which is a concrete social space of positions, offices, authorities and media, or [it] degenerates into brute force").

Private property is the concession of the collectivity." In a modern patent system a legislature exercises six discrete powers to distribute the privileges of a patent, administer its title, and enforce liabilities on behalf of its holders.

1. Determining Patentable Subject Matter

Legislative action determines the kinds of inventions and technical arts that are eligible for patent protection. Policy on eligible subject matter can evolve over a long period with unsettled contradictory outcomes. As noted earlier, pharmaceutical and medical patents have presented urgent problems linking patentability to public health. It is easy to overlook today that, consistent with international treaties, most European nations from the early to mid 20th century barred pharmaceutical and medical device patents under the rationale of *ordre public*.[96] For example, France allowed pharmaceuticals to be patented only in 1960, followed by Ireland (1964), Germany (1968), Japan (1976), Switzerland (1977), Italy (1978), Sweden (1978), and Spain (1992). Meanwhile Brazil and India, among others in the same frame of time, passed laws to exclude or curtail drug formulae from exclusionary patents (as well as the processes to manufacture them in Brazil's case).[97] From time to time the notion that a private

[96] Report of UNICEF, UNDP, World Bank and WHO Special Program for Research & Training in Tropical Diseases, *Drug Discovery and Drug Development*, March 2004, accessed December 6, 2018, https://www.who.int/tdr/grants/workplans/en/drug.pdf 3 (outlining model changes in the economics of drug development.

[97] India's Patent Act of 1970, replacing the Colonial Patents Act of 1911, granted patents on chemical processes but did not permit patents on drugs. Act No. 39 of 1970, Ch. 2 § 5. This act designated as "not patentable… any process for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings and any process for the similar treatment of animals to render them free of disease or to increase their economic value or that of their products." Patent Act of 1970 accessed December 6, 2018, http://ipindia.nic.in/writereaddata/Portal/ev/sections/ps3.ht.

party could use power to secure a monopoly over a life-saving medication or medical device has been blessed or anathemized, even though chemical and biological compounds and devices of every other sort were incontestably deemed fit for protection.

The 1994 Uruguay Round on Trades and Tariffs generated the founding documents of the World Trade Organization, including Appendix no. 4, on "Trade Related Aspects of Intellectual Property," now referred to as the TRIPS treaty. TRIPS made recognition of patent rights for medicines a required element of the international trade and tariff treaty that displaced domestic restrictions on patenting. The international dispute and sanctioning process under the WTO Disputes Settlement Understanding claimed jurisdiction over infringement issues and authorized trade sanctions for failure to observe treaty obligations to extend patents to treaty-covered subject matter.[98] Regional trade agreements have claimed concurrent jurisdiction and similarly displaced nation-based policies on patentability.[99]

In 2000, under cover of TRIPS international standards, producers of patented and branded antiretroviral drugs resisted distribution and price reduction measures to make their products available in Africa. Fatalities from untreated HIV/AIDs in the subsequent decade exceeded those from collective violence and civil war by a factor of 14, according to the World Health

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Brazil's Patent Act of 1996 (Art. 68)(Law No. 9279, May 14, 1996) and its Generic Drug Act (Law 9787, February 10, 1999,) combined to accelerate the government's capacity to scotch patent exclusivity on pharmaceuticals when the holders failed to exploit the patented drug by manufacture or by importation into Brazil. See Otto Banho Licks, " Generics and Biosimilars in Brazil: Elements of the Industrial Policy of the Brazilian Government," *Thomson Reuters Practical Law* (November 1, 2011), accessed December 6, 2018, https://uk.practicallaw.thomsonreuters.com/3-518-3314?transitionType=Default&contextData=(sc.Default)&firstPage=true&comp=pluk&bhcp=1.

[98] World Trade Organization, Uruguay Round Agreement "Understanding on Rules and Procedures Governing the Settlement of Disputes, accessed December 6, 2018, https://www.wto.org/english/docs_e/legal_e/28-dsu_e.htm.

[99] North American Free Trade Agreement, Article 1709.4, directing recognition of drug patents and including other provision that require strong patent rights and create a nondomestic dispute settlement process. The Central American Free Trade Agreement (CAFTA-DR) has likewise internationalized the terms of patentability. Texts at https://ustr.gov/trade-agreements/free-trade-agreements, accessed December 6, 2018.

Organization.[100] While the TRIPS treaty maintained some flexibility for states to impose compulsory licensing for domestic pharmaceutical emergencies, states that did not have the capacity to manufacture the drugs suffered provisions that barred one nation from exercising a compulsory licensing power to export medicine for the relief of another nation's emergency. A special WTO assembly established temporary provisional powers for cross-national collaboration and third-party licensing for the emergency.[101] Concessions from manufacturers and the contributions of private philanthropies eased the crisis. But the progress that was achieved has resulted from ad hoc accommodations and relaxations of the private patent rights of drug companies and was not reachable under the regular order of the treaty. The contrast between mortality from HIV disease and from collective violence demonstrates that restraints created by the patent system, measured by the numbers on mortality, imposed hardships more widespread than war.

A less urgent example of power over subject matter is the 20-year controversy over the patentability of business processes. Appellate decisions in the U.S. Court of Appeals for the Federal Circuit triggered an extension of the traditional industrial technical arts to include computer-generated products of the information economy. This policy resulted in approval of patents for tax planning strategies, medical treatment protocols, and business methods. Litigation flourished, with infringement defendants observing that the application of programming language to practices that were expressible in traditional language should not

[100] World Health Organization and Joint UN Program on HIV/AIDS *Report on Cause Specific Mortality-Estimated 2000-2012* (2015), accessed Sept.3, 2016, http://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html) (Improved distribution of anti retro viral medicines following the WTO's Doha Declaration in 2000 and its implementation memoranda in 2004, have lessened the acceleration of the epidemic, although AIDs morbidity in contrast to civil war fatalities remained greater by a magnitude as late as 2012.

[101] World Trade Organization, *DOHA Declaration* (November 1, 2001), accessed December 6, 2018, https://www.wto.org/english/tratop_e/dda_e/dohaexplained_e.htm.

pass the threshold of novelty. The U.S. Supreme Court eventually agreed and held that a computerized implementation of an abstract idea did not support patent eligibility.[102] The facts of the case that prompted the Supreme Court to limit rules on computerized process patents are difficult to distinguish from earlier lower court decisions approving patentability. A full discussion of the area is beyond the scope here, except to note that the disagreement over computerized process patents illustrates the changeability of subject-matter-related rules.

2. Setting Criteria of Patent Worthiness

Following a legislative framework, the patent office must decide what devices and processes are worthy of a patent as truly *novel* advances of the art. But novelty is not enough. As the Supreme Court advised, "It is as important to the public that competition should not be repressed by worthless patents, as that the patentee of a really valuable invention should be protected in his monopoly."[103] An applicant may submit an invention that is novel, but its creative or inventive step is deemed too obvious to be worth a reward. Accordingly, trivial or unimaginative applications need to be rejected. The code provides standards for granting monopolies, but the interpretation and application of the standards is the common trigger of litigation. The legitimacy of such rejections requires administrative regularity, which, in turn, requires published and well-grounded criteria. Under present rules of practice, granting a patent requires a conceptual showing of an idea's novelty (or difference over prior art), as well as its non-obviousness before being deemed patent-worthy.[104] Changes in the interpretive rules

[102] Alice Corp. v. CLS Bank International, 573 U.S. __, 134 S. Ct. 2347 (2014).

[103] General Motors v. Devex Corp, 461 U.S. 648, 658(1983).

[104] Non-obviousness is a case-by-case judgment made by patent examiners that the proposed invention is beyond the known skills of ordinary practitioners in the art and addresses a previously unrealized capability or practice. Claims of novelty can be defeated when the submitted idea is already "patented, described in a

or practice will cause the patent system to bestow its exclusive reward on different target groups of inventors and firms. If an application's claims are interpreted broadly, then the initial applicant may gain great control over whether others will work on improvements or make devices that depend on the initial patent. If claims are interpreted narrowly, then the secondary improvements that depend on the first patent are less vulnerable to infringement claims and get more room for recognition of their originality.[105] It would be well within the constitutional authority of Congress to amend statutory requirements for patent worthiness to consider factors like ripeness for commercialization. Current rules are not moving in that direction, however.

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printed publication or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention." 35 U.S.C 102 (a)(1).

[105] The factors to be considered for interpreting the scope of a patent are germane, but not essential to our argument. So it is pertinent to describe them in this supplemental note.

Two basic components comprise the claim specification within a patent application. First, the "enablement" in which an applicant provides a narrative description of the invention that aims *to enable* persons ordinarily skilled in the relevant technical art to grasp the fundamentals regarding how the particular new device can be built or a new process executed. Second, the applicant drafts a series of *claims*, often accompanied by drawings or process schematics, that show objective elements of the enablement that are novel and non-obvious when compared to prior art—that is, the matters to be treated as exclusive property. How these two elements are interpreted circumscribes the patent scope (i.e., its zone of exclusivity). Questions of interpretative discretion necessarily infiltrate these two elements. For example, for the enablement element, what constitutes enough instruction to allow a person of ordinary skill in the technical art to practice the specified art? How is "ordinary skill" to be established within each art, and when is the enablement too abstract for implementation? Policy issues affect the mode of interpretation, too. Should the requirement of enablement demonstrate that trades could absorb the technology presented or even, going further, make a prima facie showing of commercial viability, as a condition of granting the monopoly? The more exacting the requirements for an enablement disclosure, the narrower the extent of protection guaranteed by the patent.

The claims element of the patent application is similarly packed with interpretive burdens for the patent office and the public. A claim must be reduced to specific language, but an interpretive question commonly arises. Is a possible infringer circumventing claims with an artful presentation of the same concepts in different words—an elegant variation that is functionally equivalent? Likewise a competing inventor may present her own invention that arguably slips into the literal words of a prior claim but introduces appurtenant claims that make the invention distinctive and novel despite its match with the literal words of a previous patent. If an acceptable claim is drafted in broadly descriptive terms, the scope of the exclusionary protection is likewise broader. The customs and policies that govern these interpretive burdens can have a broad effect on how inventors and their sponsoring firms decide to invest or stay on the sidelines. The flexibility built into interpretive spaces invites a range of theories on the best scope of patents for diffusing and absorbing technology. Changes in the interpretive rules will cause the patent system to bestow its exclusive reward on different target groups of inventors and firms.

3. Setting the Term and the Requirements for Maintenance

The state determines the duration and schedules of fees to maintain the patent during its term. In the United States a patent does not terminate if its holder fails to develop devices or license them, although international treaties allow nations to impose a domestic patent termination on those grounds. The duration of the patent will affect strategies for investment in research as well as choices regarding whether to rely on trade secrets rather than patents. The extensive research on optimal duration need not be discussed here, except to iterate that current patent law proceeds *as if* incentives for advancing every type of technical art are optimized by the same duration. Schedules of fees to be paid for maintenance of the patent are set by nations; these may be more or less based on the intensity of the patentees' efforts to work an idea or license it, although the United States does not adopt procedures that prejudice patentees that do not work the inventions that they sought to protect.

4. Structuring Remedies for Infringement

The state sets the terms for remedies for patent infringement (injunctions, simple damages, treble damages for willful infringement, and the like). The national courts may, for example, determine that the patent holder's status as a nonuser (a non-practicing entity or NPE) may limit the right to seek the restraints of an injunction or limit claims if the patentee argues harm to its prospective market position. A patent does not inoculate the patentee from the operation of antitrust and unfair trade practice laws. The effect of available remedies on empowering private action or encouraging technology sharing is taken up in chapters three and four, below.

5. Imposing Non-Voluntary or Compulsory Licensing

The state may limit the holder's power of exclusive control with a preemptive compulsory license (or taking) on behalf of the government's own agency or a contractor doing work for the agency, subject to compensation determined by a court. Similarly, laws passed ancillary to a patent code can structure patent grants in specified areas of technology with terms for a non-voluntary "license of right" that conditions the patent on the holder's advance commitment to sublicense applicants at reasonable fees. Disputes over a reasonable fee may be resolved by binding arbitration rather than courts, if the law prescribes. The mechanisms to curb the holder's voluntary control of licensing is essential to the reforms proposed and are developed in the latter chapters of this essay.

6. Coordinating the Overlapping Domains of Patenting and Trade Secrecy

Patents are only one of two distinct regimes that control the distribution of knowledge of technical arts. Trade secrecy is the other. Legislatures and courts set the frame of enforcement for agency-granted patents, but trade secrecy is ordered privately. The claims of trade secrecy are founded in privately enforceable contractual commitments for confidential treatment of virtually anything, including, unpatented parts of an otherwise patentable invention, technical know-how like instructions on how to use or repair a complex tool, the lists of materials used in manufacturing, or rosters of customers and suppliers. Violators of confidentiality are liable for damages. The ingredient formulas for Coco Cola and Campari and Google's algorithm for page rank weighting, are notoriously claimed as trade secrets. Also, any discovery that is patentable may be ripe for treatment under trade secrecy, particularly when the inventor wants to avoid the publication of the claims and specifications and believes that the secret can be maintained indefinitely. Under

trade secrecy inventions may be transferred, subject to a promise not disclose designs, materials, or manufacturing processes. Trade secrets may often be more important to the essential differentiation of a product from its competition than patents. An inventor or enterprise concerned with protecting access to knowledge resources may decide that trade secrecy is more strategically advantageous than patents. Inventors and enterprises may also draw on both regimes to exploit the same discovery, dividing discrete elements of an invention between the two modes of protection. Mechanical characteristics might be patented, for example, while tools and methods of assembly might be maintained as trade secrets. The availability of trade secret remedies affects the scope and extent of reliance on the patent system.

Trade secrets also have profound drawbacks and are vulnerable to externalities that can extinguish them in an instant. If third parties bring the confidential material into commercial use, common law and codified trade secret law will refuse to enforce a trade secret agreement. If a trade secret holder carelessly gives benefit of a trade secret to a party that is not contractually bound, those who were previously bound will no longer be obliged under law to maintain secrecy. Accordingly, enterprises that rely on trade secrets do so selectively and carefully. Enforcement of trade secrecy is difficult, and when the practice is observed it is often based on comity and good faith among parties that want to maintain a continuing venturing relationship.[106]

[106] The legal process to protect trade secrets has until recently been a matter of state law, with 48 states adopting a Uniform Trade Secrets Act, bringing a high degree of consistency from state to state in standards of enforceability. In 2016 Congress enacted the Defend Trade Secrets Act of 2016**.** (DTSA). The new law recognizes private causes of action for trade secret misappropriation that can be brought in federal courts. With trade secret misappropriation, now defined as a federal question for treatment in the U.S. district courts, plaintiffs' may opt to file federally, where actions for trade secrecy beach and patent infringement may be heard together.

Private contractual ordering of confidentiality relationships has its own transaction costs, but trade secrecy may, depending on the invention, more effectively conceal essential know-how than patents. While some infringing products and processes are exposed when they hit market shelves or websites, the use of many innovations cannot be observed. In that case, after innovators expose technical specifications in the patent office's public files, imitators may evade surveillance or make detection very costly. Trade secrets are not burdened with the costs of patent prosecution (i.e., processes at the patent office to obtain a patent), maintenance fees, and enforcement actions associated with a patent.

Although strict proof is unavailable, some historical evidence supports a case that privately ordered trade secrecy among inventors and technologists—outside the patent system—has been more relied upon in innovation and in investment recovery than the patent system. Petra Moser studied world technology fairs of the 19th century and maintains that the majority of innovations were created and unwrapped for the world outside of the patent systems—notably more than 80 percent of exhibits at the 1851 London Crystal Palace.[107] Such early data is matched a century and a quarter later by a survey of corporate R&D managers and executives gathered by evolutionary economists Richard Nelson, Sidney Winter, and their colleagues. Their 1983 poll of 634 American research and development laboratories, as well as their 1994 poll of executives from 1478

The law governing trade secrets developed individually over decades among the states.
The Uniform Law Commission published the UTSA in 1979, which has been widely adopted with minor state-based amendments to simplify operations for businesses with multistate segments and customers. See UTSA, accessed March 10, 2019, https://www.uniformlaws.org/committees/community-home?CommunityKey=3a2538fb-e030-4e2d-a9e2-90373dc05792.

[107] Petra Moser, "Patents and Innovation: Evidence from Economic History," *Journal of Economic Perspectives* 27, no.1 (2013): 29. Moser reports that fewer than 5 percent of Britain's chemical exhibits, 10 percent of scientific instruments, and 8 percent of food processing devices were patented, compared with 20 percent of manufacturing machinery

American manufacturing firms, reported a consensus that trade secrecy strategies were more relied upon than patenting to protect investments in new processes and only marginally less effective for products.[108]

E. A Patent System for Whom?

1. Individual Ends and Public Facilities

The Introduction observed the 2018 judicial debate regarding how to characterize the origins of patents.[109] The Supreme Court considered whether patents give formal confirmation to an individual property right already earned by an inventor, or alternatively grant a public franchise for exclusive privileges from which the public might derive a benefit? At some moments the law esteems the first view, at other times its opposite. Under the property view, the law addresses the preservation of a holder's asset against *takings* and forfeitures of an inventor's spent capital or labor. Under the franchise view, the law addresses *givings* and thereby requires policy justifications for assigning opportunities for accumulating private wealth and denying to others those same opportunities. The franchise view sees the patent system and its bureaucratic offices as a public facility that, for the civic good, allots to a private person or entity a portion of the

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[108] Richard R. Nelson, Sidney G. Winter et al., "Appropriating the Returns from Industrial Research and Development" *Brookings Papers on Economic Activity* 1987 No. 3: 793-799. The overall results were varied among areas of technology.. Pharmaceutical and chemical enterprises consistently rated the patent mechanism as effective, in contrast to manufacturing firms.[108] The difference likely relates to the ease and power of chemical analysis for exact replication of a discovery, when compared with the engineering disciplines. The preponderance of current R&D expenditures and volume of patent applications, however, occurred in areas of manufacturing and its related engineering specialties despite this relatively lower regard for effectiveness. Although survey data questioned the effectiveness of patents relative to trades secrecy, manufacturing remained responsible for the majority of U.S. patents that are ultimately examined and issued according to the Council of Economic Advisors, "*Economic Report of the President 2016*," U.S. Government Publishing Office (February 22, 2016): Ch. 5 223-224, accessed November 23, 2108, https://obamawhitehouse.archives.gov/blog/2016/02/22/2016-economic-report-president.

[109] See Introduction, B.2., above, discussing Oil States Energy Services, LLC v. Greene's Energy Group LLC, 584 U.S. ___ (2018) (No. 16-712) (April 24, 2018).

previously unrestricted commons of knowledge. Put another way, the franchise view invites us to think of patent grants the same way we think of profitable government certificates for mineral or oil extractions on public lands.

One *could* argue that the property model and the franchise model are barely distinguishable in analytical terms. After all, both of them support some form of privatized allocation or anti-commons. To illustrate by way of Hohfeldian correlates, both cases provide that X will have a right to keep Y from using some designated intangible property and a power to maintain an exclusive privilege to use it. Reciprocally, Y will have a duty to avoid using it and have "no right" to prevent X's exclusive control. These formal similarities, however, must not obscure an important distinction regarding the burdens of civic accountability for rule makers and public administrators. If the purpose of the patent is merely to protect inventors from *takings* of what belongs to them inherently, then policy need not be concerned about whether the inventor is cooperating with the interests of researchers and consumers. The inventor's patent in that case is his dominion or, metaphorically, an asset in his kingdom of personal ends. If, by contrast, the purpose of the patent is to provide a judicious assignment or *giving* of franchise privileges within the otherwise unallocated public domain, then policymakers must consider how they are administering a public facility for society's general benefit. Under the both views patent holders are authorized custodians of an anti-commons over which the rules of administration allow them to block and constrain non-holders. But under the latter (franchise) view, the responsible agencies get policy space to set conditions for the granting, modifying, or terminating of a publicly franchised patent. The anti-commons can be corrected to serve a public welfare goal. For example, policies may deny exclusive

franchises to pharmaceuticals and medical devices. For another, policy could, hypothetically, limit the term of patent monopolies for a certain specialized technical art (e.g., sustainable energy) to stimulate holders to invest speedily in their own inventions on a "use it or lose it" basis. Under the franchise view, policymakers may choose to perfect the patent system as a tool to stimulate cooperative research and enterprise. To do so, they might shape rules to allow non-holders to petition the relevant agency to prevent the underutilization of knowledge when a private exclusionary patent claim collides with public needs. The property view of patents stands against such interventions.

Both the property model and the franchise model harvest private privileges for the winner of the patent. But the franchise model puts an additional burden of justification on the rules of noncooperation that dominate the patent code. From the point of view of this discussion, the franchise model hints of varied possibilities, but leaves unfinished business. Its weakness is that it falls short of a systematic institutional appraisal of whether the existing non-cooperative patent rules, discussed earlier in this chapter, should yield to a more comprehensive cooperative set of rules to supersede *both* the property and franchise models over which the Supreme Court recently puzzled.

2. Competing Institutional Formations: Private Society and Social Union

John Rawls identified a dialogic tension between two convictions that can direct the workings of public facilities and agencies. Under one of them public agencies *regulate* the collisions among private claims for private ends. Such agencies are for Rawls the pillars of a "private society," and they stand in contrast to offices and procedures that advance the shared ends of people within common institutions. He calls the contrasting conviction to pursue shared ends an "idea of social union."

As described in his *Theory of Justice,* persons or associations in a private society are competing *or* independent, "but *not* in any case complementary."[110] In such a private society public goods or facilities may be maintained by the state for everyone, but are like highways "where each person has his own destination."[111] The facilities and actions of the patent office, to draw from our own examples, are an accessible public good—that is, they are available for any applicant. But, as this essay has argued, they are designed chiefly and ultimately for the exclusionary purposes of a favored grantee.

In Rawlsian terms, persons in private society do not unify their relations with a cohesive conviction regarding those basic arrangements that are good or just for all. Instead, private arrangements persist if a sufficient number of people "maintain the scheme" out of fear that "any practicable changes would reduce the stock of means whereby they pursue their personal ends."[112] Institutions maintain stability using legal sanctions that can be applied when persons oppose each other. The idea of social union, by contrast, depends on the belief that common institutions and activities are good in themselves.[113] "Founded upon the

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[110] *Theory of Justice*, (Cambridge, MA: Harvard University Press, 1971) §79, 521.

[111] Ibid.

[112] *Theory of Justice*, 521- 522. Rawls finds the notion of private society in Plato's *Republic* §§ 369-372 (describing the model city-state as a mix of smoothly and naturally coordinated crafts, wage earners, and merchant and civic figures that can support both ordinary workers and people with luxurious appetites) and in Hegel's *Philosophy of Right*, §§ 182-187, which also describes society as a composition of private ends.

Hegel, in the cited section, observes the felicitousness of "selfish ends" to secure a substructure of civil society:

> In the course of actual attainment of selfish ends—an attainment conditioned in this way by universality—there is formed a system of complete interdependence. Wherein the livelihood, happiness and legal status of one man is interwoven with the livelihood happiness and rights of all. On this system, individual happiness &c, depend, and only in this connecting system are they actualized and secured. This system may be prima facie regarded as the external state, the state based on need, the state as the Understanding envisages it. G.F.W. Hegel, *Philosophy of Right*, trans T.M, Knox (London:Clarendon,1952 §183, p 123.

[113] Ibid.

needs and potentialities of its members," a social union provides that, "each person can participate in the total sum of the realized natural assets of the others… [and] enjoy one another's excellences and individuality elicited by free institutions."[114] This concept of social union is a position of moral respect for accommodation, *not strategic maximization*, among widely pluralized plans of citizens who adjust their claims within their shared political institutions. This position requires agreements among people who may disagree on many other fundamental matters.

Rawls believed that a just society will hold the *distribution* of native endowments as a common resource. Accordingly, policy should recognize the complementarities and interdependencies of native ability. Society cannot, however, own anyone's native ability or compel a person's uses of her special talents. A just society will protect those personal liberties. When the talents are exercised, however, a countervailing proviso directs certain limits on the extent to which the advantages of these talents may accrue: "Those who have been favored by nature, whoever they are, may gain from their good fortune, only on terms that improve the situation of those who lose out."[115] Rawls analogized the distribution of native endowments to the "mutually beneficial complementarities" of the trade-offs of comparative advantage in a modern liberal economy.[116] A policy that regards the distribution of native endowments as a common resource is both a rebuke to those perpetuities of fortuitous privileges that a private society sustains and also a recognition of the equal dignity of the persons within a social union. For Rawls a "willingness to exploit

[114] *Theory of Justice*, 523.

[115] Ibid.

[116] John Rawls, *Justice as Fairness* (Cambridge MA, Harvard-Belknap 2001), 75.

the contingencies of natural fortune and happenstance for our own advantage" denies the standing of others as equals.[117] Because society is a composition of both abilities and dependencies, disabilities belong to society just as talents do, and they, too, are part of the total stock of common native endowments, as Rawls conceives them. To summarize the main point, Rawls's scheme challenges justifications for rights that defend powers to accumulate goods that may result from an accidental assignment of gifts, talents, or inherited positions.

The moral argument for the idea of social union may be clarified by a hypothetical thought exercise where the differences derived from privileges are neutralized. If people were forced to face the future without knowledge of whether their gifts, talents, and positions could be reduced to the conditions of society's least advantaged, they would no longer find moral legitimacy in privileges derived from accident or contingency.[118] It would be rationally compelling to agree to policies that protect the least advantaged. It is from such a hypothetical exercise that Rawls derives his famed difference principle. Against the eat-what-you-kill convictions of private society, Rawls declares that the "difference principle represents, in effect, *an agreement* to regard the distribution of natural talents as a common asset and to share in the benefits of this distribution whatever it turns out to be."[119] If the rules of "the basic structure of society" (Rawls's phrase) embrace this

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[117] Ibid. 76.

[118] Rawls characterized this exercise as a hypothetical device of representation identified as a "veil of ignorance."

[119] *Theory of Justice*, 101. Under the difference principle, inequalities are deemed acceptable—that is they may be rationally chosen—if they increase welfare at the minimum.[119] So, for example, special compensations for inventors (or for that matter anyone who exercises a skill) would not be foreclosed, but they must be settled in a context that honors a societal demand not to neglect the benefit for all persons within the common distribution. In the context of our argument, exclusionary patent rules, by contrast, comprise an authorization by the state to neglect the disabilities and other inequalities they may impose once a private

principle, the moral status of accidental historical entitlements that may dominate distributive outcomes is perforce abridged.[120] A just distribution does not require equal distribution of goods, but must include incomes and opportunities sufficient to support expectations for a complete life for every member of society.

Rawls's notion of social union provides a platform for criticism of the anti-commons effects of exclusionary patent rules—whether they emerge from a model of rights based on property protection or from public franchises. Both models are inadequate under the "social union" standard. To this it must be added that social union does not determine specific end states; it is a dialogic notion for the observing the "social nature of mankind," which "is best seen by contrast with the conception of private society."[121] Accordingly, for example, we do not expect Rawlsian principles of justice to deliver specific rules of action for reform of the patent system. Nor do they de-legitimate *every* existing private end. Nevertheless, the justifications for rules that exactingly defend private rights in intangible property are required to risk censure from alternatives that prioritize commonly shared ends. Rawls's framework enjoins us to question those "rules that privilege noncooperation" that are described in section I.C above, and to reflect on the necessity of those rules insofar as they limit the sharing of the natural endowments with which to explore knowledge.

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strategic possessory position over an idea is secured. Rawls's objective is neither to guarantee private accumulation nor to disrupt all the entitlements that individuals may earn in market commerce—basic rights to hold and use property or enjoy the rewards of workmanship are legitimate expectations. He does, as noted, impose limiting conditions on the mode of accumulation of private holdings.

[120] *Justice as Fairness,* 16. Rawls observes that this protection is an essential feature of his theory of justice that distinguishes it from the views of Locke, Nozick, and Buchanan, who believe that the basic structure of society should secure benefits bestowed by the contingencies of history or native endowment in ways that are excluded by his theory's regard for principles of distribution that improve the situation of the least advantaged. The basic structure of society for Rawls is determined hypothetically and non-historically: it comprises what parties would stipulate to, stripped of their contingent advantages.

[121] *Theory of Justice,* 522.

With the conceptual mapping of the opposed notions of private society and social union in mind, let us, in the next chapter for the sake of argument, respectfully review the normative arguments that can be made on behalf of the patent system's exclusionary rules and its purported necessities to protect ideas as private property. Let's allow exclusionary rules to make their best case. If those results make a weak case for strictly private ends within the domain of knowledge, then our undertaking to develop practical alternative rules will be all the more robust. At that point, we can seek the existing practical points of leverage that would bring rules of cooperative sharing of inventions into prominence (or at least into parity) when faced with arguments for strict exclusionary rights.

Chapter II: Lack of Decisive Justifications – Neither Utilitarian or Non-Consequential

> *Man is inevitably destined to a partial cultivation, since he only enfeebles his energies by directing them to a multiplicity of objects. But man has it in his power to avoid this one-sidedness, by attempting to unite the distinct and generally separately exercised faculties of his nature.*
>
> von Humboldt[122]

A. The Predicaments of Justification

The patent system can surely express both von Humboldt's regret over the fragmentation of human potentialities and his aspiration for their coordination. The purpose of the patent as expressed in the Constitution is to promote discoveries and the benefits of learning for all, but the evolved rules promote non-cooperation and private strategic maximizing. It is not easy to justify an institution with exclusionary rules, which despite their original purpose, frustrate research, impose stifling costs of transaction, and distribute rewards arbitrarily. If coherent political and ethical reasons fail to legitimate the institution, then we will be left to conclude that it is so embedded in the habits of commercial life that people put it beyond question. To redeem the system with reasons rather than habits we must show that it is either a) utilitarian: able to generate enough observable welfare to legitimate society's commitment to it, or b) non-consequential or deontologically grounded: expressing the commitment that, independent of calculated welfare, an inventor deserves its exclusionary privileges. But the non-cooperative rules of the current patent code receive poor support from either mode of justification.

To arrive at the conclusion that utilitarian justifications are inapt and confused, we look at the strategies of famous inventors as well as contemporary political-legal theories that have

[122] Quoted in John Rawls, *Theory of Justice*, (Cambridge, MA: Harvard University Press, 1971) §79, 524.

tried to rationalize the patent system. The outlooks are irreconcilable; they do not even complement each other regarding what desirable consequences the patent system should target. Deontological (or non-consequential) perspectives are also diverse and disharmonious. Adherents of natural rights theories of property and liberty hold positions that are hostile to patents as a form of property rights, even where they uphold copyrights and strong rights in real and personal property.

B. Inventors in Practice— Three Strategies for Invention Utility

The contrasting patent strategies of three well-known American inventors—Benjamin Franklin, Elon Musk, and Steve Jobs— present stylized, opposing prototypes of how inventors may use possessory rights in the practice of their technical art.

1. Franklin: Observing the Disutilities First

Franklin's *Autobiography* recounts his outright rejection of a patent for his wood stove that was offered under the rights-granting power of Pennsylvania's colonial governor in 1742. Franklin argued, as a matter of justice, for his unprotected publishing of specifications for his "New-Invented Pennsylvania Fireplace." The device was life-style altering because it allowed both the "great saving of wood" and the labor to supply it. The colonial governor offered Franklin the privilege of "sole vending" for a term of years. Franklin stated his moral objection to the offer using his customary italics for underscoring maxims to guide proper action:

> I declined it from a principle which has ever weighed with me on such occasions, viz., *That, as we enjoy great advantages from the inventions of others, we should be glad of an opportunity to serve others by any invention of ours; and this we should do freely and generously*.[123] (Emphasis original)

[123] Benjamin Franklin, *The Autobiography and Other Writings* (New York: Signet, 1961), 128.

While today's patent holders assail infringers as free riders, Franklin, by contrast, recognized how an accretion of the inventive thoughts of others united within him. Franklin's account observes without apparent bitterness that a London ironmonger, who obtained a patent for Franklin's invention after he declined that privilege, managed to profit from what Franklin argued was a less effective modification of the original 1742 design. He also lamented that his unrestricted specification failed to accelerate improvements to his design. Franklin's British imitator's patented design changes, however, decreased the stove's efficiency and fortified its defects with exclusive rights against modified versions. Franklin added that his stove "is not the only instance of patents taken out for my inventions by others, tho' not always with the same success, which I never contested, as having no desire of profiting by patents myself and hating disputes." [124] Notably, Thomas Jefferson, whose regard for the usefulness of the patent system for the public was ambiguous, refused, like Franklin, to take out patents on his own inventions. [125]

Franklin observes both the disutility that the patent system may create and its capacity to withhold what his neighbors need for the betterment of their lives. For contrast, we fast-forward to examine the choice criteria of this century and its two most famous inventors, Jobs and Musk. Their strategic uses of the patent system differ in tactics, but both embrace the possessory rights that Franklin rejected.

2. Jobs: Extending Every Marketplace Advantage Over Goods and Labor

The actions of the late Apple CEO Steve Jobs, by contrast, exploited the patent system not to spur inventions, but to dominate the pool of talent supporting the entire industry of

[124] Franklin, *The Autobiography*, 128.

[125] Floyd L. Vaughn, *The United States Patent System* (Norman: University of Oklahoma, 1956), 6.

portable wireless devices. Jobs believed in leveraging his property rights in patents to build a corporate fortress. In 2007 he threatened his counterpart at Palm, a manufacturer of a competing device, with a sequence of patent lawsuits if Palm did not join Apple in a trade-restraining, bilateral pledge that each would avoid hiring employees from the other. Palm balked, even though Apple had already bundled similar cross-pledges among Google, Adobe, Pixar, Intel, Intuit, and Lucasfilm, which together captured substantial pooled talent in video display technologies. The Justice Department's Antitrust Division eventually intervened to scuttle the collusive arrangements, but without ordering compensation to those employees whose opportunities had been affected. Subsequently, a class of 64,000 affected employees filed their own private suit.[126] They asked for $3 billion in damages, which could have tripled under antitrust law. In September 2015, Apple and other colluding parties settled with the employee class for $435 million. Court documents detailed how the clout behind Jobs's scheme was the weaponization of Apple's patents. The bare possibility of injunctions against Palm would have hurt Palm's market capitalization. Jobs's own written communications to Palm stressed that Apple could better bear the cost of litigation. Palm's CEO refused to join the other firms, and he replied that Palm's portfolio of patents would afflict equivalent troubles on Apple. Only the Justice Department forced the swords to be lowered. [127]

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[113] U.S. District Court, Northern District of California, Re: High-Tech Employee Antitrust Litigation, 11-cv-2-509.

[127] Tech journalists developed the backstory of the patents over which Jobs and Palm CEO Ed Colligan could joust. None involved powerful or disruptive innovation within the patent-saturated cell phone world, but instead involved differentiated gestures and sequences for touch screen interfaces—nonessential, non-pioneering refinements, but because they were embedded in production they were enough to threaten business. If Apple and Palm had joined in patent litigation, each side would have argued that the other's refinements lacked patentable novelty and were too weak to enforce. Niley Patel 2014, "Apple vs. Palm: the In-Depth Analysis," *Engadget* (January 28, 2009): accessed December 10, 2018, http://www.engadget.com/2009/01/28/apple-vs-palm-the-in-depth-analysis/ .

It is unremarkable that a tycoon inventor like Jobs would threaten to use lawsuits. Fulton, Edison, and Marconi engaged in sharp legal tactics, too. But Jobs's field of play differed from theirs. His maneuver was *not* to capture design rights for his portable devices, but to use the patents as leverage over the mobility and brains of key employees in the industry—to dominate the creative talent that might *in the future* make a new product as good as or better than his. Patents, for Steve Jobs, did not simply turn knowledge into property; they instrumentalized people by disabling the choices of engineers and scientists in seeking employment. Controlling the sources of future creativity would have made him a kingpin of a buyer's cartel in technical talent, would have allowed him to control the introduction of new competition, and would have sustained high consumer prices for cartel products.

A decade before Jobs's collusive maneuvers, industry leaders warned of other obstructive, weaponizing tactics to be bootstrapped from the patent code. An executive from Cisco Systems, the technology conglomerate in networking and telecommunications hardware, explained what his company had to defend against. In a 2002 submission to the U.S. Federal Trade Commission, Robert Barr gave a concise catalog of abusive tactics being leveraged out of the patent code:

> So obtaining patents has become for many people and companies an end in itself....They try to patent things that other people or companies will unintentionally infringe and then they wait for those companies to successfully bring products to the marketplace. They place mines in the minefield. The people and companies...who file these patents and extract license fees from successful businesses play the patent system like a lottery...The long delays in the patent office work to their benefit by keeping the eventual coverage of their patents indefinite while others produce products. They benefit from the high cost of litigation by demanding license fees that are less than the cost of litigation, hoping that people will pay even if they don't infringe, or, if they do infringe, it will be too costly to change the product. This provides opportunities for contingency fee

> litigators, for licensing companies and consulting firms who claim to help people 'mine' their patent portfolios for patents that even they didn't know they had. It's hard to see how this contributes to the progress of science and the useful arts."[128]

Barr, in these remarks, rejected the very notion that patents motivate invention. "Competition has been the motivator; bringing new products to the market in a timely manner is critical. Everything that we've done to create new products would have been done even if we could not obtain patents on the innovations and inventions in those products. I should know this. No one's asked me, 'Can we patent this?' before deciding whether to invest time and resources into product development."[129] Barr's from-the-boardroom perspective may not exclude the motivational value of patents in *all* cases, but he gives credence, within the frame of his industry, to the ineffectiveness of patent rules for achieving their Constitutional purposes.

3. Musk: Open Licensing to Consolidate Dominance

In 2014 Elon Musk, an innovator in electric cars, sustainable energy, and aerospace guidance and propulsion, announced that Tesla Motors pledged never to initiate lawsuits against anyone who, in good faith, used its backlog of patented automotive technologies. "If we clear a path to creation of compelling electric vehicles," he said, "but then lay intellectual property landmines behind us to inhibit others, we are acting in a manner contrary to that goal."[130] Musk, envisioned a "race to invention" mechanism and saw his firm's best interest in using his patent backlog to form strategic alliances and build a supply

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[128] Statement of Robert Barr, Vice President and Worldwide Patent Counsel, Cisco Systems, Inc., "Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy" (Hearings Before the Federal Trade Commission, February 28, 2002): 679, accessed December 16, 2018, https://www.ftc.gov/sites/default/files/documents/public_events/competition-ip-law-policy-knowledge-based-economy-hearings/020228ftc.pdf.

[129] Ibid., 673.

chain. He saw that he might stimulate firms to engage in the research for new inventions, at their expense not his, and integrate horizontally with Tesla's leadership position in the industry. The ultimate success of the Tesla enterprise is today in doubt, but Musk's strategic play has been a credible limited-exclusivity strategy.

Musk situated his policy in a particular enterprise: Tesla. He did not reject patent exclusivity in his aerospace and energy ventures.[131] In this case, however, he observed that annual new vehicle production of traditional vehicles was approximately 100 million, on top of a global fleet of two billion. It was pointless, he theorized, to identify Tesla's true competition as a small trickle of non-Tesla electric cars. Every resource devoted to countering gasoline-powered carmakers would advance the technology platform generally and could also assist Tesla, as a first mover, to attract the world's most talented engineers, whether under his employ or that of another firm. An open sourcing policy for his patents, he observed, would strengthen Tesla's platform and its talent pool.[132] Once Musk posited that he was the prime mover in his technology, he saw the possibility of accumulating valuable refinements and products that were dependent on his patents. Rights to dependent patents of others would come to him, seeking fees that he could favorably negotiate, because his license was the ticket to the dominant application. In short, Musk was trying to trade away some monopoly power over core technology for the low-investment,

[131] Musk's strategic attitude on patents has been mutable. His Solar City Corp. assembled a wide portfolio of patents on materials and assembly techniques of solar cells and arrays without pledging to waive enforcement. See Steve Brachmann, "Elon Musk: Patent Hypocrisy on Display in Growing Solar City Patent Portfolio," *IPWatchdog,* August 11. 2015, accessed February 12, 2016, http://www.ipwatchdog.com/2015/08/11/elon-musk-patent-hypocrisy-on-display-in-growing-solarcity-patent-portfolio/id=60153/.

[132] Elon Musk, "All Our Patents Belong to You," Tesla Motors Website, June 12, 2014, accessed December 17, 2018, https://www.tesla.com/blog/all-our-patent-are-belong-you. The "no-lawsuit" pledge also appeared in an annual 10K report to the Securities and Exchange Commission because of its potential impact on assets.

monopsony position of being the lead player and prime source for profitable deployment of supply chain licenses in the electric car field. His strategy of migrating patents into a quasi-public domain would stimulate research and diffusion of learning better than an effort to reserve the monopoly and vertically integrate a closed supply chain. His rich backlog of patents in a disruptive technology (i.e., electric vehicles) might be useless against the dominant carbon-dependent technology unless he surrendered exclusivity.

Notably, neither Franklin, nor Jobs, nor Musk embraced patenting because monopoly privileges were critical to recovering investment. They either rebuked the privilege (in Franklin's case) or used it for other strategic ends (Musk and Jobs). Franklin saw the strict enforcement of a patent on his stove as a potentially predatory action. Franklin also embraced the notion that planting ideas in a public domain (although he did not use that term) was superior to patents for their diffusion and for the improvement of his own work. Elon Musk advanced a modulated strategy and reasoned that patents support initial enterprise goals, but would hamper optimization of research resources for disruptive (i.e., pioneering) technology. Steve Jobs aggressively maximized his patent rights to disable competitors, even to the extent of limiting the mobility of employees to migrate their skills and talents within his industry, using patent claims that had no other purpose than vexing his competition. All three of the inventors examined here illustrate that the ostensible origins and intent of the patent can be most unreliable explicators of its practical function.

C. Incompatible Theories on the Utility of Patents — Whose Utilities?

Three theoretical strategies for the scoping of patents challenge each other to be the best model for generating useful social returns from patenting. Yes, the proponents of these strategies concede that patents can burden the public with the deadweight losses from

monopoly. True, also, they accept that their policies may not always prevent the dissipation of research resources that may equal or outweigh the private gains of the patent winner. Nevertheless, each strategy described below proposes its own policy to maximize patent utility despite imperfections. The outcomes are antagonistic to each other, however. And for that reason they expose the difficulties of forming a consensus regarding the strategic advantages of patenting.

We contrast the policy theories of Kingston, Kitch, and Merges and Nelson. Kingston's *innovation warrant,*[133] rewards advances suitably mature for being commercially captured. Kitch's *prospector* model[134] rewards inventions according to their promise to mature into pioneering technology and accords them an exclusive control over the development of both base applications *and improvements.* Merges's and Nelson's *race to improve* model*,*[135] favors the improvements, as much or more than the pioneering invention, to accelerate the absorption of new technology.

1. Patent Only a Proven Innovation: No Reward for Ideas Alone

The traditional rationale of exchanging a monopoly for a public disclosure of an invention, Kingston argues, undervalues commitments to operational advances and excessively credits unapplied technical concepts.[136] Kingston's innovation warrant is an instrument that links the exclusive entitlement to a mature commercial application. Under

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[133] William Kingston, *Direct Protection of Innovation* (Boston: Kluwer, 1987), 1 -124.

[134] Edmund W. Kitch, "The Nature and Function of the Patent System," *Journal of Law and Economics* 20, no. 2 (1977): 265-290.

[135] Robert Merges and Richard Nelson, "On the Complex Economics of Patent Scope," *Columbia Law Review* 90, No. 4 (May 1990): 839-916.

[136] Kingston, *Direct Protection*, 2.

this concept exclusivity attaches to near-street-ready devices and methods. The specification submitted with an application is evaluated for its enablement of deliverables associated with an idea, but not just for the novelty of an idea. An innovating object has to exist or be on the threshold of operation before protection is granted.[137] Examination of the application may require third-party input and test data with regard to feasibility. The term of the patent monopoly can be adjusted by administrative judgments based on risks undertaken by the applicant. The maintenance of the warrant's privileges can be conditioned on demonstrations of progress in commercialization from time to time.

Not every interpretive problem associated with patent scope is defused under these criteria, but the hold-up or blocking power of a fundamentally conceptual patent will be neutralized. The availability of the monopoly associated with a successful innovation warrant will not necessarily deter others from working on improved applications or handcuff the research planning of non-holders, but it may be a constraint because the warrant holder can ration licenses for the base innovation associated with the improvement. Inventors, to be sure, will remain interested in the protection of their nascent, inchoate ideas from competitive poaching. Accordingly, the cost burdens of maintaining trade secrets for ideas that are not ripe for practice could increase, but under the existing system heavy reliance on pre-patent trade secrecy is already onerous. To best harvest rewards, inventors will need to make shrewd forecasts of good commercial partners and engage in joint development agreements with committed investors at an early point. The innovation warrant's patentability criteria reflect the capacity to draw investment for commercialization. These criteria, which do not reward conceptual inventions, could arguably discourage private venture capital from supporting preliminary research, but this

[137] Kingston, *Direct Protection*, 87.

problem already affects all programs for technological advance that cannot mobilize early results.

2. Reward Pioneering Ideas to Coordinate and Conserve Resources

The prospector theory of Edmund Kitch, by contrast, is built on conceptual foresight, not achieved innovations. "By a prospect," Kitch says, "I mean a particular opportunity to develop a known technological possibility."[138] A patent system that rewards exclusive rights for technological possibilities is argued to be society's most efficient coordinating mechanism and its best theoretical justification. Ordinarily, prospects may be pursued by any number of firms, and the amount of resources and the level of progress attained by each of them will be obscure to the others—a recipe for inefficiency. To illustrate: if patents were eliminated and agencies gave fixed cash rewards for inventions, an uncoordinated group of prize seekers could expend more in the pursuit than the value of the prize. From the perspective of social costs, a reward would be dissipated before any successful party could collect the benefit. Similarly, under the current system an unorganized collective research community faces the very same coordination problem, except that the dissipation of a rent-reward is simply not fixed ex ante.[139] The aspiration of prospector theory is to achieve an efficient allocation of social resources (and less dissipation) by clearing the way for a property holder who can be rewarded for successful exploitation of an opportunity clear of competing players. Patents can be theorized as a kind of prospector's grubstake that may (or may not) lead to a societal payoff. Kitch's theory draws an analogy to stakeholds for mineral rights: his model could

[138] Kitch, "Nature and Function," 266.

[139] See Mark F. Grady and Jay I. Alexander, "Patent Law and Rent Dissipation," *Virginia Law Review* 78, no. (1992): 305-350.

impose on patentees the burden put on traditional mineral stakeholders to show effort (if not results) in exploiting their stakeholds to maintain their positions. Likewise, title to land under the Homestead Act of 1862 carried the obligation to work the property as a condition of being able to invoke the laws of trespass to exclude others.[140] Some may argue that a 20-year patent based on a textual presentation of feasibility is an acceptable proxy for homesteading, but non-holders who are able to improve an immature patent that turns out to lack substantial implementation may see this stakehold structure as an unjust reward and be discouraged from applying their gifts to a prospector's unripe enterprise.

Kitch's justification operates in harmony with a neoclassical outlook that private property relations optimize demand and output. Traditional justifications for patents rely on a dual reward-incentive mechanism: investment recovery incentivizes the inventor, and the knowledge gains resulting from the removal of trade secrecy incentivize society to defend the inventor's monopoly. A solitary regulating patent can enlarge the power to vertically integrate research and supply chain resources toward a successful commercial goal. Under this model, the conceptual pioneer can consolidate a property right to achieve turnkey, in-house results. Under Kitch's prospector theory a patent's market value represents the power to coordinate future development and standardize products, and therefore may promote improved social returns by cutting the time between invention and commercialization.[141] The prospector's power will tend to steer redundant research resources away from her enterprise—arguably a social return in the form of efficient hidden-hand direction of talent. The patent owner's property right, which gives her control

[140] See John F Hart, "Colonial Land-use Law and Significance for Modern Takings Doctrine," *Harvard Law Review*106, no. 6 (1996): 1252, 1259-63 (1996).

[141] Kitch, "Nature and Function," 265.

of the development of the technological possibility, also gives possible competitors notice of her exclusive stakehold and helps free her from the costs and administrative burdens of maintaining trade secrecy, not only over the basic patent but over its internally generated improvements, too.

To give full strength to the prospector strategy, the patent specification and claims must be interpreted broadly to give the holder a long chain to swing that can knock down possible infringers and remind others to keep a distance from protected terrain. But this creates challenges for expression and interpretation of a specification. Patent office determinations of patent worthiness at the outset may be difficult because disclosures of the enablement of the invention at an immature stage may be too lightweight to test whether persons skilled in the technical art could use the disclosure to bring the prospect to the hypothetically conceived level of practice. Nor is there clear merit for the belief that, once granted, a "prospect" patent holder will act competently and efficiently as an organizer of licenses and supply chains solely because she achieved an inside track as a conceptualizer of technical information. If the lead prospector is in control, she can pursue multiple exploratory sublicenses, but the more of these that are offered, the less attractive they become to the offerees. Arguably such weaknesses can exist under current rules, but prospector theory does little to cure them.

Other factors also suggest that the prospector theory, and any other effort to mitigate rent dissipation, though tidy in theory, can be lopsided in practice. First, the marketplace and research progress may still lead to hotly contested, multiparty, and uncoordinated races to become the winning applicant for a patent prospect. Second, in the world of research there may be little room to assume that a single solution deserves to be ascendant and that

other solutions are redundant. The notion that researchers and patent officers have such clairvoyance is glib.

3. Reward Improvers Over Pioneers to Stimulate a Race to Invent

Merges's and Nelson's race to improve inverts the prospector model. Their theory aligns with the concern of the New Institutional Economics to examine how diverse transactional activities drive corporate decisions. It departs from Kitch's emphasis on the effects of property relations on demand and output, a domain of neoclassical economics. Their focus remains on stimulating pioneering or disruptive advances, but they make what at first may appear to be a counterintuitive case for limiting the scope of protection for pioneers. Namely, system rules should emphasize incentives for second generation or follow-on inventors whose opportunities for reward should not be prejudiced by the exclusionary power of concept originators. Their model responds to the diverse bargaining settings occurring among pioneer inventors and the developers of subsequent improvements and applications.[142] Innovation requires a plurality of transaction types ranging from straight licensing of intellectual property, to joint development of components, to strategic alliances for marketing and production, to corporate acquisitions. The rules of patent protection should promote transactional ease for the ongoing formation of relational contracts, not just protect initial proprietary claims. The pioneer's bargaining strength should not dominate the inventors of those off-shooting improvements that can accelerate commercialization. Rivalry in the commercial development stage accelerates the number of useful inventions and enhances the collective learning curve, resulting in a diffusion of competence in technical art. Merges and

[142] For discussions of bargaining scenario see Robert Merges, "Intellectual Property Rights and the New Institutional Economics," *Vanderbilt Law Review* 53, no. 6 (2000):1856-1877;also Jerry R. Green and Suzanne Scotchmer, "On the Division of Labor in Sequential Innovation," *Rand Journal of Economics* 26, no.1(1995): 20-33.

Nelson bring to bear case studies and other empirical data against the prospector theory's arguments that central coordination of a broad technological prospect maximizes efficient use of research resources. Accordingly, their race to improve commends rules for scoping patent protections that narrow the power of pioneers to assert infringement. The pioneer might be allowed to draw some revenues from advances made by improvers but would have less power to check their activity and to integrate single-source power over improvers. Accordingly, the interpretative focus of the enablement and claims sections in patent specifications should narrow the claims exclusivity and infringements. Shorter patent terms and requirements for active working of intentions would also stimulate the race to invent.

If patents are to be justifiable because they are a mechanism for maximizing an efficient social returns system, then theorists should be able to agree on what types of rules best support the welfare to be realized. They do not. Instead, they collectively present a mash of plausibilities. They do not agree on what types of opportunities the patent system should encourage to best justify its monopolistic and exclusionary effects. Moreover, the excursion into these three models exposes the troublesome challenge of imposing a single style of exclusionary protection across every type of technical art. The disparities in these exclusionary models advise us that there may be no single optimum model for spawning new productive research; each industry and art may have its own best conditions for advancement. The disparities expose the inadequate common understanding about how patents should operate to establish rules for an agreed-upon utilitarian calculation of what will be beneficial.

D. Non-Consequentialist Doubts Over Exclusive Rights

1. Does Labor Validate Deservingness?

It could be rash to straightaway reject the current patent system even if we conclude that patents cannot optimize the diffusion of technology or provide reliable social returns under a utilitarian calculation of benefit. Justifications for the system could lie somewhere independent of such consequences. That possibility must be examined before we recommend scrapping the system or requiring a design overhaul.

A non-consequential (or deontological) justification is one that invokes a principle that all reasonable members of society should be willing to accept as a command. It is unlike a policy justification based on a calculation of benefits or utilities. Rather it ascribes rights (and corollary duties) to persons because they are citizens (or otherwise in some included class) of the society. The authority of such rights is not validated by custom, economic outcomes, inheritance, force, or the favor of the sovereign, although practical rules and cultural norms spring from them. Non-consequential justifications are likely to be expressed as religious doctrines, natural law, or inferences from a rational inquiry about essential human nature. Whatever its source, a deontological or non-consequential account is ascendant over positive laws or administrative routines, which must be harmonized with the account to be legitimate. It voices a temperament and spirit regarding what is owed to others universally.

The patent is unique among property interests. Once its holder is empowered, a patent can confine the exercise of imagination and creativity in the non-holding community. In modern parlance the patent "colonizes" the mind of the community as well as the physical resources that execute a technical art. In short, patents are liberty constraining—both for

the exercise of mind and the use of material resources. The institution of the patent forces us to weigh a trade-off: the deservingness of its holder (i.e., our duties to her) against the sacrifices of liberty imposed on the non-holder.

Kenneth Arrow gave a label to a traditional ethical temperament within market society that links individual possessory rights and ratifies individual moral deservingness. He called it "the productivity principle," which implores a maxim of natural justice for acquisition of property: *an individual is entitled to what he creates.* Accordingly, one's labor stakes a claim to personal exclusionary entitlement. Arrow was only an observer, not a sponsor of this principle, which he said is "widely and unreflectively held," and also "less than self-evident."[143] Nevertheless, he allowed that its roots are deep. This principle can become for many the irreducible ground of all well-developed institutions, particularly for those who see an individual's capacity to freely develop market relations for property acquisition, wealth accumulation, and transfer as an essential expression of self-worth. It is, to reprise the terminology of Rawls from the last chapter, a private society where parties tender their cooperation *conditionally* to serve private advantages—rejecting an undertaking to cooperate in the forming of shared ends.

Without endorsing C.B. McPherson's historical explanation of how a culture of possessive individualism materialized during the 17th century, one can appreciate his observation of the prime mechanism of interactions in a private society: cooperation by aggregating bilateral transactions, each freely negotiated:

[143] "Some Ordinalist-Utilitarian Notes on Rawls's Theory of Justice," *The Journal of Philosophy* 70 no. 9, (May 1973): 247-248. Arrow's coinage of the productivity principle is his description of a counterpoint against Rawls's difference principle.

> The individual in market society *is* human as proprietor of his own person. However much he may wish it to be otherwise, his humanity does depend on his freedom from any but self-interested contractual relations with others. His society does consist of a series of market relations.[144]

Market transactions wear the attire of cooperation. Cooperation can be tendered either in the form of an agreed-upon exchange or by a contractual release of possessory privileges, including possibly acts of un-coerced charitable will. These acts purport to represent man's essential nature and to confine cooperation within privatizing practices.

Patent law, too, came to be stamped with the seal of man's *essential* nature. For example, the preamble of the French Patent Statute of 1791 defends the fundamental justice of patents and insists:

> The national assembly, considering that every new idea whereof the manifestation or development may become useful to society belongs originally to him who conceived it, … it would be to attack the rights of man in their very essence not to regard a discovery in industry (in useful arts and manufactures) as the property of its author. [145]

But the French statute also provided immediately thereafter that "Whoever is the first to bring into France, a foreign discovery shall enjoy the same advantages as if he were the inventor thereof." [146] This made the "very essence" of these natural rights outstandingly French.

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[144] *The Political Theory of Possessive Individualism* (Oxford: OUP, 1962), 275.

[145] Translations from Report from the Select Committee on the Law Relative to Patents for Inventions Great Britain. Parliament by the House of Commons, Select Committee on the Law Relative to Patents for Inventions (1829): 222-224, accessed July 30, 2018, https://books.google.com/books?id=x75AAAAAcAAJ&pg=PA223&lpg=PA223&dq=text+French+Patent+Law+of+May+25,+1791+text&source=bl&ots=Y_Zvu4XKJW&sig=-a-ahhgFqHsR6WTZoauvRLZA17A&hl=en&sa=X&ved=2ahUKEwifhJqD_MfcAhXCmOAKHfYOBe8Q6AEwEHoECAcQAQ#v=onepage&q=text%20French%20Patent%20Law%20of%20May%2025%2C%201791%20text&f=false.

[146] Ibid.

Notwithstanding this French tradition, in the domain of patents, the productivity principle, as an essential right within the marketplace, has two plainly contrary applications—one, statist-liberal, and the other, libertarian. The principle is plastic; it can support the patent system, and it can defeat it. The statist-liberal view champions the productivity principle when it recognizes the risk that an unregulated marketplace may not adequately protect property. It aligns inventors with patent regulation under a state bureaucracy to optimize returns with a monopoly and attaches the invention to contractual terms for its grant (e.g., publication of the specification). By contrast, the Libertarian view champions the same principle on behalf of contractual liberty by opposing patent rights as a liberty-breaching invasion by the state that causes fully independent inventors to lose their rights despite their creative labor being just as creditworthy as a successful patentee's. The loss may occur just as the French statute encouraged, when a poaching foreign national may bring an inventor's work to a new country and collect the rewards. It may occur, as well, among purely domestic players where the opportunistic first-filer wins the monopoly despite the essential preceding work of other free persons. Sections 3 and 4 of this chapter, below, treat how the sponsors and detractors of patents deploy the productivity principle's notion that labor confirms entitlement to property to arrive at their opposite conclusions.

2. Artifacts of an Ethical Divide in International Law

A contest between the productivity principle for private acquisition vs. the principle of cooperative ends materializes within the terms of the international conventions that address patents. For example, Article 15 (b) and (c) of the International Convention on Economic Social and Cultural Rights (ICESCR) ascribes an individual right of everyone to enjoy the

benefit of technological advances alongside preservation of the moral and material rights of an inventor or author. ICESCR Article 15 provides:

> The State Parties to the present Covenant recognize *the right of everyone*:
>
> (a) To take part in cultural life;
> (b) *To enjoy the benefits of scientific progress and its applications*;
> (c) To benefit from the protection of the *moral and material interests* from any scientific, literary or artistic production *of which he is an author*.[147]
> (Emphasis added)

These terms are virtually identical to ones that appear in the U.N. Declaration of Human Rights (Article 27), but ICESCR has the status of a formal international convention among 169 state parties, albeit one that the United States has shunned. The principles are only precatory; they fall far short of a set of durable institutional rules under which a person can assert claims. ICESCR, as a treaty, affirms an ethical framework and lacks controls over domestic legislation. Its preamble calls for the "progressive realization" of its principles.[148]

Article 15(c)'s concept of protection for inventors is notable for what it does not say. Inventors and authors are not assigned strict rights to exclusivity and monopoly from their patents and copyrights, but only that they have some *protectable* material and moral interests. These could comprise much less than the maximal powers of exclusivity or nonuse; perhaps something as thin as public, accurate attribution of their work when others use it might satisfy their interest under this vague standard. Article 15(c) also leaves room for interpretation regarding the protections that commonly devolve by transfer to licensees or investors, whose compensation from terms of exclusivity may far exceed the rewards going to creators. Notably, Article 15(c) refers only to individual "authors," not their legal

[147] ICESCR (1976) https://www.ohchr.org/en/professionalinterest/pages/cescr.aspx.

[148] A signing state will "Take steps... to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized in the present Covenant by all appropriate means, including particularly the adoption of legislative measures." ICESCR Article 2.

successors (e.g., corporate investors), who do not directly touch the creative process. ICESCR does not expressly urge a guarantee of the full rights of transfer that the concept of ownership customarily entails. To what parties, therefore, would Article 15(c) apply? The text uses the pronoun "he" to refer to inventors and authors, which could exclude legal collective entities. Moreover, the official commentary of the U.N.'s Committee on Economic, Social and Cultural Rights suggest that Article 15(c) does not give legal assignees of patents and copyrights nor non-natural persons the protection of "human rights" as it does for those natural persons who generate new works.[149] The ambiguous drafting leaves both inventors and legal successors in limbo under its terms. Inventors are commonly agents of corporate entities, and the treatment of claims of sponsors of creative work is an important matter of institutional policy that must be faced at the outset of any reform effort. ICESCR remains at the fringe of practical institutional design. Amartya Sen, in his essay "The Right Not To Be Hungry," argues that we need a special category of rights, what he calls "meta-rights," that advance economic aims by specifying the

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[149] United Nations Committee on Economic, Social and Cultural Rights, 35th Session, Geneva (2005), General comment No. 17 on covenant Article 15 1(c)., E/C.12/GC/17, accessed February 19, 2019 at https://www.refworld.org/docid/441543594.html. The committee advised:

> The Committee considers that only the "author," namely the creator, whether man or woman, individual or groups of individuals, of scientific, literary or artistic productions, such as, inter alia, writers and artists, can be the beneficiary of the protection of article 15, paragraph 1 (c). This follows from the words "everyone," "he" and "author," which indicate that the drafters of that article seemed to have believed authors of scientific, literary or artistic productions to be natural persons, without at that time realizing that they could also be groups of individuals. Under the existing international treaty protection regimes, legal entities are included among the holders of intellectual property rights. However, as noted above, their entitlements, because of their different nature, are not protected at the level of human rights.
>
> The protection under article 15, paragraph 1 (c), need not necessarily reflect the level and means of protection found in present copyright, patent and other intellectual property regimes, as long as the protection available is suited to secure for authors the moral and material interests resulting from their productions.

responsibilities of institutions to work towards defined ends and by identifying the agents with duties to achieve those ends. Meta-rights do not enumerate actions to be taken, but they direct an agenda. [150] In this light ICESCR Article 15 has merit as a meta-right.

ICESCR was signed in 1978, but never ratified by the United States. Instead the official United States position at the time of ICESCR's ratification was a zealous rights-based defense of self-promoting entrepreneurship for patent holders. U.S. Ambassador W.E. Schuyler, at a 1980 diplomatic conference on patents in Geneva, argued:

> A patent right is a right to exclude others from using an invention. A right to use one's own invention is an individual right. The right to use one's patent is a separate property right…. What abuse could possibly be so terrible that it warrants depriving an individual of his right to use his own property? *[The United States] will not be a party to any treaty which deprives an individual of his right to own his own inventions*.[151] (Emphasis added)

Schuyler is as resolute as the ICESCR is ambiguous. Both sides are carrying the flag of human rights, but ICESCR, despite its lack of institutional horsepower, observes the necessity of a compromise between individual ownership and social returns from innovation. The contrast highlights that United States policy in defense of exclusive property rights and full control over transfer of inventions has a frail claim to heritage within liberal society's most widely sponsored framework of individual human rights.

3. Natural Rights Protests Against Entitlements for Intangibles

Rawls derived rules to construct social unity based on mutually recognized interests among people who might have widely different and pluralized views about moral justifications. The contrasting notion of private society marches behind the flag of various

[150] In *Contemporary Philosophy 2,* G. Floistad (ed.), (The Hague: Martinus Nijhoff,1982), 343-360.

[151] World Intellectual Property Organization revised provisional summary minutes (p. 91) PR/SM/5 1982 quoted in Susan Sell, *Power and Ideas* (Albany: State University of New York Press, 1998), 124.

conceptions of natural property rights. When it comes to patents, however, natural rights thinking flinches at the privileges of exclusivity, despite its general devotion to private holdings. Proponents of natural rights bring three complaints, each of which assert claims of justice, *against* patenting: 1) misappropriation of a prized common heritage; 2) encouragement of morally unjust surplus accumulation that protects monopoly or wastes human or physical resources; and 3) authorization of institutional invasions of the liberties of persons to privately order their lives through contracts. The writings of its best champions also advise that the patent system lacks justifications both in political practice, as well as principles of natural law.

a. Locke's Campaign Against Waste.

John Locke's narrative on justice in the acquisition of property maintains iconic cultural significance. Although one will not find a direct exposition of patent rights in Locke's work, powerful objections can be inferred. Natural rights thinking, following the arguments of Locke's *Two Treatises of Government,* commits to the view that the acquisition of private property is a natural right that precedes civil society and is not its product. The commitment, however, is closely connected to the idea that property does not merely comprise goods but also dwells in the "lives and liberties" of self and others.[152] Locke's extension of property beyond commodity and corporeal form requires that possession be alloyed with propriety and duty. He advances his views on the just acquisition of property along side righteous condemnation of claims of possession that abide nonuse of either human or material assets.

[152] John Locke, *Two Treatises of Government*, ed. Peter Laslett (Cambridge: Cambridge University Press, 1988): II, ch. IX, ¶ 123, 350.

Locke's observations of the acquisition of property hold little support for retention of monopoly control of an idea. Just acquisitions have religious moorings for Locke. Property originates in grace, as God's gift to people in common and without private dominion.[153] His *Two Treatises of Government* aims to explain how, consistent with God's will, persons may justly come to allocate this gift without a social compact or any other legal accessories of a civil society.[154] The account boils down to this: in nature, justice may inhere in the acquisition of property by merging honest industry with the gifts of nature, but any opportunity to acquire shall be offset by contempt for wastage, as stated most famously in his "proviso" that an acquiring party has a duty to leave *enough and as good left in common for others.* Waste and nonuse of what has been acquired is anathemized.

In his occasional writing as well as his formal work, Locke censures surplus accumulation. For example, in *Thoughts Concerning Education,* on the moral training of youth, written after the *Two Treatises*, he says, "The desire of having in our possession and under our dominion more than we have need, being the root of all evil, should be early and carefully weeded out."[155] There and throughout the formal *Treatises* Locke allows exclusive possessory rights for what persons need "for the support and comfort of their being,"[156] but not for *all* the claims, incidents and privileges that the modern marketplace

[153] Locke, *Two Treatises,* II ch. V, ¶¶25, 26, 286.

[154] Ibid.

[155] John Locke, *Some Thoughts Concerning Education* (1693), eds. Grant and Tarcov (Indianapolis; Hackett; 1996), 81.

[156] Locke, *Two Treatises,* II ch. V., ¶26 286.

may provide.[157] Most notably, in distinction from the labor-based individual possessory rights, Locke recognizes that accumulation must yield to the countervailing natural right to surplusage that belongs to those in extreme need.

> As much as anyone can make use of to any advantage of life before it spoils, so much by his labor he may fix a property in; whatever is beyond this, is *more than his share, and belongs to others.* [158] (Emphasis supplied)

Today's patent-hoarding marketeers of pharmaceuticals would fare poorly under Locke's proposed sanctions. "No man," he says in the first of the *Treatises of Government*, "could ever have a just power over the life of another, by right of property in land or possessions."[159] Workmanship and honest industry do confer a title, but *never* without qualifications. A duty of charity to one in extreme need, Locke argues in the *First Treatise*, may reduce "title to so much of another's plenty as will keep him from extreme want."[160] At this extreme Locke appears to want to be taken literally. The re-appropriation from a private stock of plenty actuates at the threshold of life-and-death emergencies.[161] Locke's

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[157] Locke attaches the word "property" to " lives, liberties, and estates"—a composition of corporeal and incorporeal objectives comprising all that a citizen may control in the reach of his own person.

[158] Locke, *Two Treatises,* II, ch. V, ¶31, 290.

[159] Locke, *Two Treatises,* I, ch. IV, ¶42, 170.

[160] Ibid.

[161] The contrast here with Hobbes's more secular liberalism is illuminating. Hobbes objects to surplus accumulation because of its tendency to generate conflict. It offends not because it threatens lives created by God, but rather peace. Like Locke, Hobbes imputes, as one of his fundamental laws of nature, a duty to repudiate excessive surplus accumulation.

> The fourth precept of nature is, *that every man render himself useful unto others*….So man, for the harshness of his disposition in retaining superfluities for himself, and detaining of necessaries from others, and being incorrigible by reason of the stubbornness of his affections, is commonly said to be useless and troublesome onto others. Now, because each one not by right only, but even by natural necessity, is supposed with all his main might to intend procurement of those things which are necessary to his own preservation; if any man will contend on the other side for superfluities, by his default there will arise war; because that on him alone there lay no necessity of contending; he therefore acts against the fundamental law of nature….

Thomas Hobbes, *Man and Citizen*, ed. Gert (Indianapolis: Hackett, 1991), *De Cive,* §3, ¶9, 141.

duties of charity do not commend a welfarist policy that anticipates the needs of the disadvantaged or the protection of their opportunities or life prospects—just their lives. Nevertheless, the duty to support the poor devolves to the public. To support the duties of charity, lean though they may be, property may be taxed. In his *Essay on the Poor Laws,* Locke, speaking as a founding commissioner of England's Second Board of Trade,[162] urged both tax collection to maintain the poor within municipal corporations and holding such taxes to their lowest possible level by assigning the poor to menial work.[163] Locke's objections to many forms of taxation did not extend to government avoidance of managing the survival of the poor, as a duty enforceable against the private holdings of the prosperous.

The *Second Treatise* advises that waste (and "possession without due use") is punishable under the same laws of nature that justify possessory rights.

> He that so employed his pains about any of the spontaneous products of nature, as any way to alter them, from the state which nature put them in, by placing his labor on them, did thereby acquire a propriety in them. But if they perished, in his possession, without their due use… he offended against the common law of nature,

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To the same effect, see *Leviathan,* ed. Curley (Indianapolis: Hackett, 1994) Ch. xv, ¶17 (conditions of peace), 95. ("The observers of this law may be called Sociables; the contrary, stubborn, insociable, forward, intractable.").

[162] Locke's role on the Board puts the body of his work, as it pertains to questions of liberty and property, in perspective. Peter Laslett observes Locke's seminal role in the imperial aspirations of his country:

> The Board of Trade of 1696, however, was a relatively stable and satisfactory institution, and a permanent one, lasting as it did for three generations. These were the generations when American political society grew to maturity. And here we meet with a striking paradox. For the doctrine of self-government and the doctrine of trust, the informing principles of the second British Empire and now of the English-speaking and English-educated world, were first codified by John Locke, a founder-member of the body which became a historical symbol of the determination to deny these doctrines in the case of America and everywhere else.

Peter Laslett, "John Locke The Great Recoinage, and the Origins of the Board of Trade: 1695-1698," *The William and Mary Quarterly* 14, no. 3 (July 1957): 370-402.

[163] "An Essay on the Poor Laws," in *Locke's Political Essays*, ed. Mark Goldie (Cambridge: Cambridge University Press, 1997), 182-197.

> and was liable to be punished; he invaded his neighbors share, for he had no right, farther than his use called for any of them. [164]

Locke's contempt for waste also mobilized the practical justification to support new acquisition by colonial governments in North America. The Lockean proviso, joining property to the laborer "at least where there is enough and as good left in common for others" conveniently aligns with the aggressive appropriation of the unused commons for later distribution to productive enterprises.[165] Hence, the Lockean proviso rationalized the curtailment of aboriginal rights and acquisition of aboriginal lands—a matter of possible relevance to Locke's commercial interests in the Carolina colony.[166] The personal rewards for productivity among colonizers were reciprocally the foundations of a sovereign's justified dominion over abundant, ostensibly unproductive, native property.[167] What harm would come to natives, when there was *so much* land—land that, for its aboriginal holders, must have been a superfluity? Stopping waste could thereby become a defense for appropriation, too. For such dispossession no consent was needed; a universal natural right ratified a Godly purpose in colonial takings. The extension of agricultural productivity in North America properly ordained mankind's duties of custodianship of the resources provided by God, which would be otherwise fruitless. For Locke, a just acquisition of

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[164] Locke, *Two Treatises,* II, ch. V, ¶ 37, 295.

[165] Locke, *Two Treatises,* II, ch. V, ¶ 28, 288.

[166] Locke served as executive secretary and landgrave of the Carolinas and co-drafter of the Fundamental Constitutions of Carolina, which accorded slaves an unqualified right to be members of the Christian church that they select, without otherwise derogating the right of every freeman to have "absolute power and authority over his negro slaves." The privilege of church membership was extended because "Charity obliges us to wish well the souls of all men." *Locke's Political Essays,*179.

[167] James Tully, *An Approach to Political Philosophy: Locke in Context* (Cambridge: Cambridge University Press, 1993) 137 ff.

property must be bound to its sustained productivity, which would be an improvement of nature that would allow the partition of the commons into private holdings.[168]

To move from his stylized state of nature to emerging commercial society, Locke still needed to account for the latter's pervasive inequalities and accumulations of surplus. To fail to do this would consent to iniquities. The media of coin and bills of exchange allowed Locke to fashion theoretical arguments that reconciled just acquisitions, inequality, and his canon against waste. Entrusting value to gold, silver, or another tangible medium allows exchange without risking the spoliation of nature under truck and barter; the shrewd accumulation of gold and silver allows what Locke calls "just property" to enrich its holder beyond his needs. Locke explains,

> If he would give his nuts for a piece of metal, pleased with its color; or exchange his sheep for shells, or wool for a sparkling pebble or a diamond, and keep those by him all his life, he invaded not the right of others; he might heap up as much of these durable things as he pleased; the *exceeding of the bounds of his just property* not lying in the largeness of his possession but the perishing of anything uselessly in it.[169]

Expansive possessions may be just if they do not spoil what may be used by others.

Permissible inequalities and "just property" are not easily made compatible with property rights over intangibles. Exclusionary rules that prohibit the diffusion of knowledge, encourage the nonuse of an invention, or block improvements of an invention are far outside the Lockean modes of justification—scarcely ratified by them. Although Locke's natural right principles of just property are incompatible with strong exclusionary patent rights, they are arguably friendly to other mechanisms to support inventions, such as direct rewards to inventors.

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[168] Locke, *Two Treatises*, II ch. V, ¶40, 296.

[169] Locke, *Two Treatises*, II ch. V, ¶46, 300 (Locke's emphasis).

But a further topic remains to be raised: the counter-currents in Locke's works regarding the very existence of *any* self-evident, natural rights.[170] Peter Laslett called Locke, "The least consistent of all the great philosophers" and characterized the thinness of Locke's natural law foundations for property rights within his political writings:

> Natural law, in his system in *Two Treatises*, was at one and the same time a command of God, a rule of reason, and a law in the very nature of things as they are by which they work and we work, too.[171]

But the inconsistency is deeper still when his other major work is compared. The *Two Treatises of Government*, although in preparation for several years prior, appeared in 1690, the same year as his epistemological treatise, *Essay Concerning Human Understanding.* One set of writings impeaches the other. Written while Locke was wearing the hats of a natural philosopher and physician, the *Essay* advises people of intelligence to reject reliance on innate ideas—both metaphysical and moral. The *Essay* announces its mission to controvert notions "commonly taken for granted" that "there are certain *principles, both speculative and practical*, universally agreed upon by all mankind… which the souls of men receive in their first beings and which they bring into the world with them as necessarily and really as they do any of their inherent faculties."[172] Book I in Locke's *Essay* is headed "Neither Principles Nor Ideas Are Innate… No Innate Practical Principles," and argues that natural and moral philosophy cannot discover universal principles.

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[170] The argument here follows and hopefully amplifies a discussion by Morton White in his essay on "Original Sin, Natural Law and Politics," in *Social Thought in America: The Revolt Against Formalism* (New York: Oxford University Press 1976), 266 ff.

[171] Laslett, "Introduction," *Locke, Two Treatises of Government* (Cambridge, UK: Cambridge University Press, 1988), 82.

[172] John Locke, *Essay Concerning Human Understanding.* (New York; Dover, 1959,) v. I, bk. 1, Ch. 1, ¶2, 38-39.

> Where then are those innate principles of justice, piety, gratitude, equity, chastity? ... If we look abroad to take a view of men as they are, we shall find that they have remorse, in one place, for doing or omitting that which others, in another place think they merit by…There is scarce that principle of morality to be named, or rule of virtue to be thought on […] which is not, somewhere or other, slighted and condemned by the general fashion of whole societies of men governed by practical opinions and goals living quite opposite to others.[173]

The thrust of his argument here is not merely that moral principles cannot be innate, but further, that that they cannot be self-evident (i.e., they cannot carry evidence of their rightness within their own terms). Even when a "self-evident" principle is to be invoked to describe moral understandings, per an anti-rationalist presupposition of the *Essay*, its validation is only by experience over which no universal moral principles can rise. Hence, "There cannot be any one moral rule proposed where a man may not justly demand a reason: which would be perfectly ridiculous and absurd if they were innate; or so much as self-evident, which every innate principle must needs be, and not need any proof to ascertain its truth nor want any reason to gain it approbation."[174]

Yet, turning back to the political advocacy of the contemporaneous *Treatises of Government*, Locke relied on self-evident, universal principles as a moral core—for example, regarding both self-ownership and the correctness of servitude, as constant natural principles. Accordingly, under the laws of nature,

> *There being nothing more evident*, than that creatures of the same species and rank promiscuously born to all the same advantages of nature and the use of the same faculties should be equal amongst another without subordination or subjection, unless the Lord and Master of them all, should by any manifest declaration of his will set one above another and confer on him by an evident and clear appointment an undoubted right to dominion and sovereignty.[175]

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[173] Locke, *Essay,* v.1 bk., I, ch. II, ¶10, 74.

[174] Locke, *Essay,* v.1 bk., I, ch. II, ¶ 4, 68.)(Passage highlighted in White, *Social Thought*, 269).

[175] Locke *Two Treatises*, II, ch. II, ¶.4 , 269.

Even more strikingly at odds with his rejection in the *Essay* of innate and self-evident practical ideas is his positing in the *Treatises* of a universal regard for promise-keeping of a type that makes markets possible everywhere.

> The promises and bargains for truck, etc., between two men in the desert island… or between a Swiss and an Indian in the woods of America are binding to them, though they are perfectly in the state of nature in reference to one another. For truth and keeping the faith belongs to men, as men, not as members of society.[176]

The flips and rotations between the *Treatises* and the *Essay,* his two most formally assembled books, lead to an inference that Locke himself could not securely explain whether possessory rights originated by political convention or by attachment to natural law. He no doubt felt eager to justify that some possessory rights would not offend the will of God and that such rights are not without limits. Beyond that, it is hard to say.

Does Locke's *Essay*, freed from the charge of the *Two Treatises* to imagine progress from a pre-political state of nature, provide guidance on what his views would be on the encouragement of inventions?[177] Here, too, is ambiguity. Locke, in his own vocabulary, articulates the concept of disruptive technological change. The printing press, the compass, and the correct administration of quinine (kinkina), he argues, "may be of greater benefit to mankind, than the monuments of exemplary charity, that have at so great charge been raised by the founders of hospitals and almshouses."[178] But he remains lukewarm to the ambitions for technological progress. The capacity to probe nature and generate inventions "is the lot and private talent of the particular men." Locke avers cautiously that he does not

[176] Locke, *Two Treatises*, II, ch. II ¶14, 277.

[177] Locke, *Essay,* Book IV, ch..12 , ¶ 12, 352.

[178] Ibid.

"disesteem" their study of nature, but he commends more a pious impulse that "morality is the proper science and business of mankind in general." Better it is that men's inquiries aim to a sort of knowledge "most suited to our natural capacities and carries in it our greatest interest…i.e., the condition of their eternal estate."[179]

The exclusive appropriation of ideas would surely impoverish the commons and implicate the proviso's injunctions against waste. Locke's treatment of labor-based acquisition of possessory rights supports only a conditional or prima facie claim to the products of one's own workmanship, and ultimately restrictively qualifies possessory rights *to every* artifact of mankind's creation, tangible or intangible. His work undermines the advocates of strong patent rights. Locke's thoughts from the *Essay*, coupled with his own expressions of limits on possessory rights in the *Two Treatises,* should reprove those who take comfort that a natural rights tradition sponsors the allocating of knowledge resources with exclusionary privileges.

The justice of a patent, however, did not need to be anointed as a natural right to have persuasive force with the American founders. They believed that a patent system might validate itself as a useful commercial instrument rather than one built on the pretenses of universal justifications. That impulse seemed to move both Jefferson and Madison, who notwithstanding their expressed dedication to universal natural rights rejected them to support patents. In fact, they detailed their natural rights-based demurrals against them, cast doubts on their justice, and expressed their tolerance of them with caution and some embarrassment.

[179] Locke, *Essay,* Book IV, ch..12 , ¶ 11, 350-351.

b. Inventions Are Not Like Other Property: Objections of Jefferson, et al.

The patent clause of the U.S. Constitution is power conferring—Congress maintains the sole power in the Republic to fashion a system of patent claims with exclusive rights for inventors.[180] The constitutional power bars state-based patents, but does not obligate Congress to implement any system whatsoever. Nor does the Constitution prescribe the duration of patents, the criteria of patentability, or the categories of inventions that may be protected. The patent and copyright clause, as characterized by Madison in Federalist 43, is one of the "miscellaneous" powers in Article I for avoiding vexing issues stemming from non-uniformity among states. [181] Textually, the patent clause emits not a whiff of natural rights justifications—no inventor's rights are ascribed, and, to the contrary, conditional and mutable discretion of legislators is confirmed. Madison's Federalist 43 provides a scanty justification of the clause. Madison argued, elliptically and perhaps without candor that "the utility of the [patent] power will scarcely be questioned." Notably, it is utility, not right, that he relies on. And contrary to Federalist 43's confidence, he and Jefferson had been vexed with serious questions over the suitability of *any* patent power during the Constitution's drafting. The greatest virtue of the patent clause was its reservation of power to foreclose in this domain conflicts of laws among the states. When it came time to persuade the ratifiers, however, Madison, the advocate, cited a legal heritage for the clause. He observed that the protection of copyright has been adjudged in Great Britain as a "right of common law," [182] and, accordingly, a right to useful inventions would be a proper

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[180] Article I § 8 ¶8 "to promote the progress of science and useful arts by securing, for a limited time, to authors and inventors the exclusive right to their respective writings and discoveries."

[181] Federalist 43 in *The Federalist Papers*, ed. Rossiter (New York: New American Library, 1999), 239.

[182] Federalist 43, 240. Madison's description of the derivation of copyright under Great Britain's law was arguably loose. England's highest court was still hotly divided in the late 18th century on the question of

extension of that convention in the new republic. This line of argument, however, exposes, even if esoterically, Madison's skepticism over the pertinence of natural rights. Common law rights are supported by custom and usage and are mutable. Natural law or conceptions of enduring natural justice may inhere in some rules of common law, but common law rules derive from living controversies, and they evolve. To cap the point that the derivation of his position is not solely from natural right, Madison says, "The public good fully coincides in both cases [copyright and patent] with the claims of individuals."[183] What is notably omitted in his discussion is any correlation of patents for useful inventions with rights of private property derived from creative labor. The advancement of property rights famously receives substantial attention from Madison during the ratification debates, most discernibly in Federalist 10, but not in this domain. In his earlier correspondence with Jefferson, Madison seemed to assume that the granting of patents should be a conditional privilege, with the public maintaining its right to intervene and withdraw the patent for an amount liquidated in its initial grant. The patentee would never be subject to a total forfeiture, but the public would never be subservient to a monopoly, either. On the contrary, to Jefferson in October 1788, Madison argued,

> With regard to monopolies they are justly classed among the greatest nusances [sic] in Government. But is it clear that as encouragements to literary works and ingenious discoveries, they are not too valuable to be wholly renounced? Would it not suffice to reserve in all cases a right to the Public to abolish the privilege at a price to be specified in the grant of it? Is there not also infinitely less danger of this

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whether the exclusive copyright could be asserted under common law. For example *Millar v. Taylor,* reported in 4 Burr. 2303 (1769), found for *perpetual* common law copyright, but the result was upset under *Donaldson v. Beckett,* 4 Burr. 240 (1774*)* where the House of Lords found such rights subject to statutory limits—not common law. The history is set out, among other places, by the U.S. Supreme Court in *Wheaton v. Peters* 33 U.S 591 (1834).

[183] Ibid.

> abuse in our Governments, than in most others? Monopolies are sacrifices of the many to the few. [184]

Madison's best-defined thinking on the relation of property rights to monopoly interests is set out in a 1792 post-ratification article that gives little support for private rights in intangibles. He defines "property" as "that dominion which one man claims and exercises *over the external things* of the world, in exclusion of every other individual."(Emphasis supplied).[185] A concern regarding restrictions on patents might be inferable from his urging that the government abjure restrictive monopolies that limit the application of personal gifts and talents and thereby limit a person's exercise of the means to acquire property.

> That is not a just government, nor is property secure under it, where arbitrary restrictions, exemptions, and monopolies deny to part of its citizens that *free use of their faculties*, and free choice of their occupations, which not only constitute their property in the general sense of the word; but are the means of acquiring property strictly so called. (Emphasis supplied) [186]

Observe Madison's attention to the two "senses" of the term "property," following the 17th century usage conventions of Locke and others.[187] The "general sense" comprises control over one's own activity (conscience, opinions, religion, as well as goods), and the "strict"

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[184] *The Founders' Constitution*, v. 1, ch.14, doc. 47, accessed January 19, 2019, http://press-pubs.uchicago.edu/founders/documents/v1ch14s47.html.

The passage reflects a transactional-exchange view of patents. Trade secrets are abandoned in exchange for monopolies, subject to the grantor's right of monopoly termination for a fee. The rights are transactional, contract based, and not derived from claims of natural justice.

[185] *National Gazette* (1792) in *James Madison: Writings*, ed. Jack Rakove (New York: Library of America , 1999) 515-517.

[186] Ibid. 516.

[187] "Though the Earth, and all inferior creatures be common to all men, yet every man has a *property* in his own *person.* This no body has any right to but himself. The *labour* of his body, and the *work* of his hands, we may say are properly his." Locke, *Two Treatises*, II, V, ¶ 27, 287.

sense refers to possession of land and personal property. This passage expresses the concern that the reward of monopoly shrinks the person's capacities. Impairment of the faculties "indirectly violates their property." [188] Although the formulations are abstract, they rebuff notions of universal natural right for monopoly in intangible technical art.

There is further important evidence in the discussions between Jefferson and Madison that the patent clause developed out of a predicament of a purely political sort, not out of the desire to uphold a form of natural right. Jefferson, who was in Paris during the drafting and ratification of the Constitution, on word of its approval by nine states, called it a "good canvas" whose strokes need only some "retouching" in a bill of rights. Seeing that the unelaborated power of creating monopolies had not been excluded in the newly ratified patent clause of Article I, Section 8, Jefferson wanted to secure a well-specified restraint on such a federal power. From Paris in July 1788 he took a hard line and said to Madison that the "incitements to ingenuity… even of limited monopolies were too doubtful to overcome the importance of a general suppression of such monopolies, altogether."[189] The mischief that resided in an unmodified patent clause was apparently the possibility left open of long or perpetual monopoly, a close and dreaded cousin of prerogative, which in the new country could become an apparatus for the ambitions of a high-handed political class.

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[188] Madison, *National Gazette*, 517. Protection of creative faculties is further enjoined in this passage from the same work:

> If there be a government then which prides itself in maintaining the inviolability of property; which provides that none shall be taken *directly* even for public use without indemnification to the owner, and yet *directly* violates the property which individuals have in their opinions, their religion, their persons, and their faculties; nay more, which *indirectly* violates their property, in their actual possessions, in the labor that acquires their daily subsistence, and in the hallowed remnant of time which ought to relieve their fatigues and soothe their cares, the influence will have been anticipated, that such a government is not a pattern for the United States. (Emphasis in original).

[189] To James Madison from Thomas Jefferson, 31 July 1788, *Founders Archive of the U.S, National Archives*, accessed August 8, 2018, https://founders.archives.gov/?q=%20Madison%2C%20July%2031%2C%201788&s=1111311111&sa=&r=48&sr= .

Strict control of monopolies, in general, was more important at this time than fashioning exclusive property rights out of intangibles. When the following year Madison shared an early draft of the bill of rights, Jefferson yielded a little. Jefferson's edits to an embryonic draft added a to-be-determined fixed limit to patent rights that read, "Monopolies may be allowed to persons for their own production in literature and their own invention in the arts for a term not exceeding (___) years but for no longer term and no other purpose."[190] His proposal exposed a conceptual conflict between the way Jefferson and Madison saw a bill of rights. Jefferson included five elements in his draft that aimed to create institutional fences against the abuses he feared from a political class. Rather than merely enumerate inviolable individual rights, Jefferson wanted to operationalize a bill of rights to restrain particular forms of partisan political power; patent monopoly was a political power to be checked, not a derivative of individual natural right. All of Jefferson's proposals toward this end failed to find their way into Madison's more mature drafts that were presented to the First Congress. The reciting of these details regarding the emerging bill of rights, however, establishes that, at those pivotal moments, Jefferson worried that patents could be a threat to essential rights, not an instrument of their preservation. [191] In fact, as a general view, far from worrying that natural right must preserve property, Jefferson, at times,

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[190] To James Madison from Thomas Jefferson, 28 August 1789, *Founders Archive of the U.S, National Archive*, accessed August 8, 2018, https://founders.archives.gov/?q=%20Madison%2C%20August%2028%2C1789&s=1111311111&sa=&r=2&sr= .

[191] In a story redolent of Franklin's treatment of his stove, Jefferson ignored commercial patenting possibilities for his own important development of the "moldboard plow of least resistance." From 1794 he circulated conceptual and mathematical models of his device through United States and across the ocean to invite others to perfect it, and in 1804 received an award from a French agricultural society for pioneering an important agricultural application. His dedication to collaborative, noncommercial means of diffusing useful learning in this matter is recounted in I. Bernard Cohen, *Science and the Founding Fathers: Science in the Political Thought of Jefferson, Franklin, Adams and Madison* (New York: Norton, 1997), 293-295.

observed that laws of property, if too strictly maintained, violated natural rights unless redistributive measures secured the safety of the unemployed poor.

> [A] means of silently lessening the inequality of property is to exempt all from taxation below a certain point, and to tax the higher portions of property in geometrical progression as they rise. Whenever there are in any country uncultivated lands and unemployed poor, it is clear that the laws of property have been so far extended as to violate natural right. The earth is given as a common stock for man to labor and to live on. If for the encouragement of industry we allow it to be appropriated, we must take care that other employment be provided to those excluded from the appropriation. If we do not, the fundamental right to labor the earth returns to the unemployed. [192]

After the enactment of the first patent act in 1790 and the ratification of the 10 core amendments of the Bill of Rights in 1792, Jefferson warmed a bit to the patent system. As Secretary of State he took on personal responsibility for examining and granting the first United States patents, and he allowed that the work, at the outset, had been gratifying.[193] Years later, he became vexed over the burden of patent examinations, struggled with how to organize a patent office, and reflected that a pre-grant patent examination system (as opposed to a registration system that would resolve patent controversies, post-grant, based on arising cases) might *not* be optimal. These ruminations are treated elsewhere, but it is useful to look at Jefferson's closing retrospections on patent rights dating from 1813, in his letter to Isaac McPherson, where perceived abuses under the patent act led him to speculate

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[192] *Thomas Jefferson: Writings* ed. Merrill D. Peterson (New York Library of America , 1984), 841-842.

[193] Letter to Benjamin Vaughan June 27, 1790

> An act of Congress authorizing the issuing of patents for new discovery has given the spring to invention beyond my conception. Being an instrument in granting the patents, I am acquainted with their discoveries. Many of them are trifling, but there are some of great consequence which have been proved by practice and others which if they stand the same proof will produce great effect.

Accessed August 8, 2018, https://www.encyclopediavirginia.org/Letter_from_Thomas_Jefferson_to_Benjamin_Vaughan_June_27_1790.

about the underlying morality of the system. The abuses so moved Jefferson that he questioned society's recognition of intangible private property in general.

Jefferson observed that on the expiration of an initial patent for a mechanical device, a patentee could also seek a grant for exclusivity on certain uses of the original mechanical device when newly attached to some traditionally available devices. Jefferson and his correspondent worried that the assertion of novelty in a second grant (although not the first) was unjustifiable and constituted an ex post facto law insofar as it appropriated exclusivity in uses of the traditional appurtenances that were previously unrestricted.[194] This apparent excess prompted Jefferson to opine that for any form of property "stable ownership is the gift of social law." Focusing then on intangibles, he added that "It would be curious, then if an idea, the fugitive fermentation of an individual brain, could, of natural right, be claimed in exclusive and stable property."[195] Accordingly. "The exclusive right to invention [is] given not of natural rights but for the benefit of society."[196] He proceeded with an even stronger proposition that could point to patents as an offense to nature,

> He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me. That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them like fire, expansible over all space... incapable of confinement or exclusive appropriation. Inventions then cannot, in nature, be a subject of property.[197]

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[194] *Thomas Jefferson: Writings* 1286-1294.

[195] Ibid. 1291.

[196] Ibid. 1291. Jefferson's point is observed by the Supreme Court in the contemporary textbook case of *Graham v. John Deere*, 383 U.S. 1, 9 (1966). The court cites Jefferson's rejection of natural rights in inventions in the context of discussing the standard of non-obviousness—the notion that patents should be withheld from obvious or incidental improvements. Patents result from executive decisions regarding their importance. "Only inventions and discoveries which furthered human knowledge, and were new and useful, justified the special inducement of a limited private monopoly," said the Court in its summation of Jefferson's beliefs.

[197] Ibid.

He does not, however, urge abandonment of the system. Patents are redeemable, as public rights, *if* the outcomes from exclusive rights "may produce utility, but this may or may not be done, according to the will and convenience of the society, without claim or complaint from anyone."[198] In other words, the grant of a patent should proceed from sensible policy, not natural rights. Jefferson added his general assessment that, but for England and the United States, "other nations have thought that these monopolies produce more embarrassment than advantage to society… and the nations that refuse monopolies of invention are as fruitful as England in new and useful devices."[199] As socially constructed claims, Jefferson's ideal patent would be granted *and withdrawn* under standards of politically identified social need.[200]

4. Rebukes from Libertarians: No Justice in Patenting

Three thinkers, who identify themselves as libertarians, explored the injustice of the patent system from a firmly micro-strategic perspective of its harm to an individual's

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[198] Ibid. 1292.

[199] Ibid. 1292. Regarding contemporaneous views on the exploitation of foreign practice see Hamilton's Report on the Subject of Manufactures to the U.S. House of Representatives, supporting the view that the founders did not associate the protection of authors and inventors with the protection of natural right. Hamilton argued that constitutional powers for the protection of authors and inventors should extend to introducers, specifically, foreign persons who brought useful inventions, especially machines, into the United States. The rights of the laboring inventor clearly stopped at the border and perforce were not natural rights. His position accords with French patent legislation that excluded foreign inventors from the benefits of property in inventions that were otherwise deemed an element of the essential "rights of man." Hamilton's letter advises that the protection for inventors should extend only upon showings of proven utility. Rewards are warranted for inventions "of the surest efficacy. It seems impracticable to apportion, by general rules, specific compensations for discoveries of unknown and disproportionate utility." *Founders Archive of the U.S, National Archive,* accessed September 9, 2018, https://founders.archives.gov/documents/Hamilton/01-10-02-0001-0007#ARHN-01-10-02-0001-0007-fn-0209,

[200] For a view that most interpretations of the Jefferson-MacPherson correspondence overstate Jefferson's antipathy to natural rights in intangible property, see Adam Mossoff, "Who Cares What Thomas Jefferson Thought about Patents-Reevaluating the Patent Privilege in Historical Context," *Cornell Law Review*, 92 (2007): 953.

rightful powers. Murray Rothbard, Robert Nozick, and Ayn Rand dismissed the relevance of societal returns, however measured: the patent system worried them as a threat to essential personal liberty, as each defined it. Paradoxically their antipathy to a patent system stems from deep beliefs that an individual's ideas indeed *are* her private property. They reject the notion of social contract, generally, as well as the particular idea that a patent is a legitimate social exchange in which an inventor's disclosures to the patent office are rewarded with monopoly protection by the state. They agree that the foremost goal of institutional rules is the minimization of the regulation of property and the maximization of the capacity of persons to order their affairs by private ordering and contracts. Reluctance to esteem these objectives results in either misappropriation of justly earned property, moral laxity, or weakened resistance to authoritarianism. Their commitment to the fullest liberty for the individual discards collective redistributive policies, even if they may increase the material means of citizens to expand freedom of movement or widen their choice of occupations.[201] Each of them voices a decisive objection to controls that regulate inventive activity—even while they allow that patents can stimulate economic activity.

For two libertarians, the problem of concurrent and independent inventors is the most vexing one to be addressed (see I.C.2, supra). How shall the concurrent and independent inventor, who is blocked from harvesting the fruit of her creativity, be treated? For Rothbard, exclusive patents and the prejudice they inflict on those inventors are irremediably unjust. Nozick fashions a condition to cure Rothbard's objections, but for

[201] Contrast this with Rawls's linkage of liberty with the collective obligation to assure sufficiency of primary goods needed for a complete life as a fully participating member of society. See e.g., *Justice as Fairness*, 58-59; *Theory of Justice*, §13, 92-93. Rejections of utilitarian justifications can be said to align libertarians, in one narrow sense, with Rawls, whose ethical temperament is otherwise inapposite.

reasons to be explained, fails to see that it is a poison pill that kills the asset values that inventors would rely on to recover their investments. By contrast, Rand thinks a race to the patent office that penalizes losers is a superb expression of the human personality. Let losers lose; competition perfects humanity.

a. Rand: The System Represses Healthy Enterprise Combat

Rand's discussion of property is both polemical and elliptical, but not without popular endorsements. Chairman Alan Greenspan of the Federal Reserve Bank and Speaker Paul Ryan in the U.S. House of Representatives saluted her views on deregulation of property. For Rand, a sickness materializes in modern liberal society from the conflict between capitalism and altruism, the latter being the residue of mysticism. Unalloyed competition, unbounded acquisition, and, literally, selfishness in the frame of competitive capitalism are the best realizations of man's nature; capitalism, in other words, should not prioritize claims on behalf of the common good.[202] The common good is an "indefinable and undefined concept," she maintains, "There is no such entity as the tribe *or the public*; the tribe (or the public or society) is only a number of individual men." "A disembodied aggregate of relationships," cannot make moral demands or seek justice. [203]

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[202] "What Is Capitalism" in *Capitalism: the Unknown Ideal* (New York: New American Library,1967), 20.

[203] Ibid. Robert Nozick set out a similarly quotable remark in his query and response against the notion of common good in *Anarchy, State, and Utopia*: "Why not… hold that some persons have to bear some social cost and benefit other persons more, for the sake of overall social good? But there is no *social entity* with the good that undergoes some sacrifice for good." (New York: Basic Books, 1974) 30-31.

Recall a similar formulation of Margaret Thatcher from 1982 "And, you know, there's no such thing as society. There are individual men and women and there are families. And no government can do anything except through people, and people must look after themselves first." Thatcher's supporters claim she was arguing on behalf of the emancipation of individuals and identifying their responsibilities to society as persons, not in justification of selfishness. Thatcher did not expressly align her views with Rand. Gaffar Hussein, "There's No Such Thing as Society," *The Commentator*, April 17, 2013. Accessed August 14, 2018, http://www.thecommentator.com/article/3276/no_such_thing_as_society.

Her short essay on patent and copyright shows her hardnosed mode of melding ethics and law. Rand argues that the opportunity to be the winner and not be a loser in the race for exclusive rights incarnates a spiritual flourishing:

> As an objection to the patent laws, some people cite the fact that two inventors may work independently for years on the same invention, but one will beat the other to the patent office by an hour or a day and will acquire an exclusive monopoly while the loser's work will then be totally wasted. This type of objection is based on the error of equating the potential with the actual. The fact that a man might have been the first does not alter the fact that he *wasn't*. Since the issue is one of commercial rights, the loser in a case of that kind has to accept the fact that in seeking to trade with others he must face the possibility of a competitor winning the race, which is true of all types of competition.[204]

Rand's most particular complaint is that government's unjustly retained powers of regulation to annul a patent in an antitrust action or compel licensing in an agency's taking on behalf of the public are corrupt.[205] Accordingly, the solution to the problem of concurrent and independent inventors is to re-conceptualize it as a virtue: it is a problem only for the loser. Rand acknowledges that someone (someday) must determine the fair and advantageous duration of patents or rationalize a basis for limiting perpetuities that might kill competition. These are mere details that must not distract anyone from an

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[204] Rand, "Patents and Copyrights," in *Capitalism: the Unknown Ideal*, 133.

[205] Ibid. The zeal with which epigones of Rand are offended by the regulation of patents is illustrated by the editorial of the Atlas Society ("The Cipro Looters") in the December 2001 edition of their *Navigator* magazine. In fall 2001 five people were killed and 17 infected from a malicious dispersal of anthrax. In anticipation of possible anthrax attacks, Canada imposed a compulsory license on the patented drug Cipro, to guarantee that manufacturers other than the patentee could support emergency demand. The U.S. Secretary of Health and Human Services threatened to do the same. This, it was argued, constituted a "looting" of Bayer, the drug's patentee, they argued. The compulsory license " became an epidemic in its own right." The editorial asserted that ample antibiotics were available to deal with the crisis, but discounted those considerations. The most threatening epidemic was diminished property rights. The editorial argued, "If an inventor has no right to exploit his invention, it is hard to see what bases anyone has for a property right…. The deaths of anthrax victims were tragic. But tragic too was a naked revelation of the media, politicians, and large segments of the public as looters-in-spirit." Both governments contemplated compensation to the patent holder, and the license was to be nonexclusive, leaving the patent intact for all other nonemergency uses. Compensation was no protection of liberty interests under this version of libertarianism. "The Cipro Looters," *Navigator*, December r2001, accessed October 10, 2018, https://atlassociety.org/commentary/commentary-blog/4157-the-cipro-looters?highlight=WyJjaXBybyIsImNpcHJvJ3MiXQ== .

appreciation of the hierarchy of liberty interests. Hence, if freed from regulation, the patent system can be benign, despite any flaws, so long as it organizes an arena for competitive excellence. Any problem of justice or deservingness becomes moot once the finish line is crossed.

b. Rothbard: Patents Invade the Liberty to Contract

The virtue that Rand observes becomes a fatal defect for Murray Rothbard. Patenting is a monopoly invasion of property rights and individual liberty. A free market (i.e., one that is free from invasive state power) cannot support patents as administered under national codes but could, Rothbard tentatively argues, support an alternative system of perpetual copyrights tailored to inventors. Rothbard uses some traditionally observed distinctions between patents and copyrights to fashion a transformative argument for re-conceptualizing the patent system.

Copyrights, in both the common law tradition and contemporary statutory forms, are, by Rothbard's analysis, in family with private contractual rights that distinguish them from the publicly generated rights undergirding the patent system.[206] A creator in the domain of copyright, upon committing a work to a material expressive form (e.g., poem, musical arrangement, or painting), imposes a restrictive condition on all persons who may read, hear or observe the work *not to duplicate* that form without an agreement. Copyright, so his argument goes, potentiates enforceable private contracts between the creator and a universe of possible user-copiers. A contract forms whenever a use of the copyrighted item occurs. The essential terms in a nutshell are: no duplication unless the condition is waived

[206] See 17 U.S.C. §§ 408, 411. Copyrights attach without registration before a registrar agency, under common law and statutory systems. They are unenforceable, however, until they are registered, and registration and enforcement may occur retroactively, even after the action of an unauthorized copyist.

by the owner of the right or money is paid to her. Violation of those contractual conditions gives rise to an action for copyright infringement.[207] Under the action, the originator files what is *in effect* a breach of contract suit against the copier, who may defend by either providing evidence that the copy is a different expression from the putative original or that the original had never been encountered and arose entirely from her independent efforts. In the event that a person succeeds in showing the independent generation of the material (e.g., song or song arrangement), then the defense succeeds and no remedy is available. Unlike a patent, whose grant supports monopoly prohibitions against prior, concurrent, or subsequent inventors making, using, or selling articles that express his idea, the copyright is nonexclusive as to any independently created expressions of the copyrighted matter. Copyright is anchored in the physical matter expressed, not "any idea, procedure, process, system, method of operation, concept, principle, or discovery."[208]

Reasonable people may debate when a copied item is identifiable or distinct from an original. Such matters create vexing disputes and confuse fact finders in trials, to be sure. Nevertheless, the object of a copyright is defined in the fixed, expressed corpus. Patents, by contrast, are free floating and susceptible to being attached numerous objects . The meaning of patent specifications and drawings is found in interpretation and determined, subsequent to the grant, based on actions of users, inventors, and the claims they may make against each other. The scope of a claim specification and its drawings may be determined only as they come to be challenged. For example, as noted earlier, the express and literal words of a patent claim may be interpretively extended by administrative and judicial

[207] Murray Rothbard, *Man, Economy, and State with Power and Market* (Auburn, ALA: Ludwig Von Mises Institute, 2009), 745-754.

[208] 17 U.S.C. §102.

determinations when competing manufacturers or claimants are deemed to use an inventive insight of the patent despite arguments that their work may be described in different words or drawings.[209] Patents are infected, therefore, by recurrent constructions and refinements of the scope of the monopoly. The liberty of independent inventors is subjected to the insecurity of unknown claims against them. For Rothbard this distinction is of the highest significance and must not be trivialized. His critique is a doubled-edged rebuke against patent system failures to support a private contract model. The government, first, deprives independent creators of their rights to engage in stable, private bilateral transactions for the use of their creative labor. The exclusion of their creative product from the market is an invasion of the state against their liberty because the prevailing patent holder is a stranger to the enterprise of the independent inventor, whose commercial liberty should remain unconstrained. Second, government interpretative authority over the scope of patents means that competing inventors, who seek to make private agreements with potential licensees, are stymied by uncertainty over whether their inventions will be deemed infringing equivalents to previous patents and may have their agreements scuttled after being freely entered into.[210] Ultimately, for Rothbard, preventing liberty infringement is far more important than protecting an originator's investment position.

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[209] This empowerment of patent authorities in the interpretation of competing claims falls under the *doctrine of equivalents*, which allows for the literal words of a patent claim to be interpreted to support practical and functional uses of the patent specification so that originating claims are not diminished by small technical variations inserted by competitors. Hence there is the term "nonliteral infringer," denoting a person whose invention falls outside the literal words of a claims specification, but is substantively reliant on the originally specified idea. Notably the problem of interpreting the literal words of claims may also work to the disadvantage of the originating inventor. Courts recognize a *reverse doctrine of equivalents* that may be invoked when an invention conforms to the literal claims of an existing patent, but includes appurtenant devices or processes that are so substantial and useful that a finding of infringement on the original claims is deemed inequitable. These two doctrines are the subject of exhaustive discussion by courts and scholars.

[210] *Man, Economy, and State*, 752.

Rothbard speculates about the manner in which an acceptable patent system, following principles of the copyright system, could come to be. Perhaps a claim of patent could be stamped on an article with a notice of the claim, and use of the article would activate the implied contract with obligation to pay for its use or seek a waiver.[211] Hence, a patent might be viable to the extent that it could be treated like a copyrighted expression. The notion falls apart quickly, and Rothbard is not naïve about the difficulty of such a copyright-patent mixture. Claims and specifications cannot be affixed to a specific article. For Rothbard's speculative experiment for implied contracts for inventions to succeed, clear and distinct notice to the public of the protectable subject matter is essential. But technical art and the ideas associated with it are usually concealed when incorporated into products and processes. Rothbard accordingly withholds support for trying to graft a copyright regime onto industrial and technical arts, because "by the nature of things, some products (e.g., books, paintings) are easier to prove to be unique products of individual minds than others (e.g., mousetraps)."[212] Rothbard's sober conclusion, in his words, is: "On the free market, there would be no such thing as patents."[213]

c. Nozick: A Cure as Bad as the Disease

Robert Nozick's *Anarchy, State and Utopia* suggests, contra Rothbard, the possibility of a just patent system. He devises a bypass to Rothbard's concerns over the liberty-infringing elements of patents that purport to protect independent and concurrent inventors

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[211] *Man, Economy, and State,* 747.

[212] *Ethics of Liberty* (New York: New York University Press, 1998), 124.

[213] *Man, Economy, and State*, 748.

against the claims of patent holders.[214] Nozick's protective cure, however, would so diminish a patent's asset value that no one would bear the transaction costs to obtain it. As a result, if Nozick's prescription applied, Rothbard's conclusion would still hold: "on the free market, there would be no such thing as patents."

Nozick's goal as a political theorist is to demonstrate the merits of the private society that Rawls abjures. He describes his work as a "fundamental potential explanation" of the feasibility of a just and legitimate minimal state that can emerge from a depoliticized natural state by processes that could but do not necessarily occur; he would show—logically, not politically—how a state could arise from anarchy, as represented by Locke's state of nature, without consolidation by a sovereign will or reliance on "fundamental coercive power."[215] Nozick cautions at the outset that he will not try to account for institutional transitions from an existing liberal market society to his ideal.[216] Nozick does not see his minimal state emerging as a result of individuals contracting socially with the state or among each other to form a state. Rather, in the putative pre-political state, individuals initiate ad hoc transactions on an agency-client basis for protection against others who would not act morally.

These contracts may be, at first, spread among various competing agencies that under the pressure of transactional efficiency devolve, as by an "invisible hand," into a dominant protective agency.[217] As the dominant agency acquires authorization to use force on

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[214] Nozick does not expressly distinguish his views from Rothbard's, nor discuss any other issues pertaining to the patent system patents. The framing, however, squarely confronts Rothbard with whom there was much disagreement on the viability of Nozick's minimal state.

[215] *Anarchy, State, and Utopia* (New York: Basic Books, 1974), xi. 9.

[216] Ibid. 6-8.

[217] Ibid.,18-22.

behalf of its clients, it, in effect, becomes a minimal protective state. Nozick argues, controversially, that its dominance could be achievable without violating any one's natural rights. By these operations his minimal state could emerge with moral legitimacy, because it is built on an accretion of personal transactions for economic goods and not acquiescence to a sovereign. Its institutional structures would forswear controls over the accumulation and distribution of wealth, and aim only to protect transactional integrity against fraud, theft, and breach of contract.[218] Nozick asks readers to assume that various evolving original agencies will act non-aggressively "in good faith and within Locke's [benign] law of nature." [219] But does this not presume the conditions of good order that Nozick wants to secure? Certainly, this cup of good faith truly runneth over because Nozick also proposes that *competing* protective agencies, which may have to interact without benefit of natural geographical borders, would agree on behalf of clients to form appeals courts with jurisdictional rules and the ability to resolve conflicts by interpreting or forming rules of law. [220] The ground rules of Nozick's explorations have prompted other libertarians, like Rothbard, to call the work an immaculate conception of politics.[221] Must one suppose then

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[218] A basic aim of political justice is to protect historical entitlements. Contrast this with Rawls's derivation of just principles that resists the privileges of historical accidents, discussed II.C.1. above.

[219] *Anarchy, State, and Utopia*, 17. Nozick glosses Locke's observations of the state of nature's noxious "inconveniences" (rash assertions of rights to punish, vigilantism, and score-settling) that compel movement from nature to civil society. Protective associations are simply assumed to be less aggressive than their clients.

[220] Ibid., 16.

[221] Murray Rothbard, "Robert Nozick and the Immaculate Conception of the State," *Ethics of Liberty*, 231-253. Among many criticisms, Rothbard scoffs at Nozick's assumption that private agencies will successfully consolidate a clientele with requirements that the clients forfeit rights of private retaliation at pain of refusing to protect them against counter retaliation. This scenario is psychologically improbable and more likely to prompt interagency racketeering among agencies that compete in the protective association market.

that Nozick conceives of a social contract arising among competing protective agencies, but not among people?

Nozick's legitimated minimal state is his expression of an ethical temperament based on the "separateness of persons," whose liberty is secure from intrusion by state demands for their sacrifice on behalf of a common good or the collective needs of others.[222] The work's main relevance to this discussion is his treatment of patents in the context of Locke's proviso on the preservation of the commons. He accepts a stylized Lockean model of initial property acquisition to derive the grounds of just distributions: his undertaking, redolent of Locke's, requires him to show how un-owned objects may first attach to personal possessory rights, where means for assigning titles are lacking. But contrary to Locke, Nozick's rights' possessors should never yield significant liberties by joining a social contract—a distinction Nozick explicitly draws.[223] Nozick, moreover, rejects Locke's vision that that every possession necessarily emerges from the commons subject to terms of use, such as non-waste.[224] No such rules encumber Nozick's account of initial acquisitions, which except in the most extreme conditions, would see a commitment to the preservation of the commons as dilutive of individual rights in a private society. Nozick rejects the duties that are fundamental to Locke and styles a notion of personal inviolability: to wit, when the state becomes the custodian of public welfare, it *unqualifiedly* violates everyone's liberties. In rebuke of all notions of social union he says,

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[222] *Anarchy, State, and Utopia*, 31-33.

[223] Ibid. 131-132.

[224] *Two Treatises*, II, ch. V, ¶¶26-27.

"There is no social entity with a good that undergoes some sacrifice for its own good. [225] For Nozick, once property is justly acquired, in accordance with his theory of entitlement, that property may not be taxed without consent of the holder, including when the conditions of holding are sustained inequalities of opportunity. The only just transaction is a voluntary one. [226]

Locke famously allowed (as noted earlier) that acquisitions of personal property or wealth could justly diminish the commons, *but only if* other persons were left "as much and as good."[227] This proviso not only sets limits on just acquisitions, but it also creates a personal duty toward the integrity of the commons that is punishable if breached. For Locke the limit of surplus accumulation is reached when the opportunity to benefit from the exploitation of nature is restricted by private surplus accumulation. While a duty to preserve the commons is not within Nozick's conceptual vocabulary, he does accept the narrow *possibility* that in his minimal state an unjust aggregation of otherwise just

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[225] The kernel of Nozick's moral philosophy is that

> [T]here is no social entity with a good that undergoes some sacrifice for its own good. There are only individual people, different individual people with their own individual lives. Using one of these people for the benefit of others uses him and benefits the others. Nothing more. What happens is that something is done to him for the sake of others. Talk of an overall social good covers this up. (Intentionally?) To use a person in this way does not sufficiently respect and take account of the fact that he is a separate person, that this is the only life he has. *He* does not get some over-balancing good from his sacrifice, and no one is entitled to force this upon him—least of all a state or government that claims his allegiance (as other individuals do not) and that therefore must scrupulously be *neutral* between its citizens.

Anarchy, State, and Utopia, 32.

[226] Nozick argues, "The major objection to speaking of everyone's having a right *to* various things such as equality of opportunity, life, and so on, and enforcing this right, is that these 'rights' require a substructure of things and materials and actions; and *other* people may have rights and entitlements over these. No one has a right to something whose realization requires certain uses of things and activities that other people have rights and entitlements over. If his goal requires the use of means which others have rights over, he must enlist their voluntary cooperation."
Anarchy, State, and Utopia, :238.

[227] *Two Treatises of Government,* II, Ch. V, ¶27, 288.

acquisitions can occur "where someone appropriates the total supply of something necessary for life." For the possibility that a great calamity involving necessities of life may sometimes need to be avoided "any adequate theory of justice in acquisition will contain a proviso… similar to the ones we have attributed to Locke."[228] Such a proviso appears to operate only in emergency conditions.

Nevertheless, for reasons that he does not elaborate, Nozick examines the patent system, without context in acutely life and death matters, to illustrate how society could rely on a stylized Lockean proviso to justly reallocate privileges or resources. If a person obtains an object that would not have existed without her efforts, no injustice can *ordinarily* result from the surplus wealth accumulated by its creator, according to Nozick. Accordingly, patents are generally not objectionable and cannot be an affront to a commons nor be the basis of any other opposing claims, he argues. But, observing how patents can foreclose the rights of the concurrent or independent inventor, Nozick proposes a corrective reallocation rule. Hence, "independent inventors… should not be excluded from utilizing their own invention as they wish (including selling it to others)."[229] Because it is the patent itself that creates a condition of scarcity for independent inventors, Nozick's selection of patents rights as a proviso trigger for the minimal state's intervention against surplus accumulation is a curious excursion. After all, the problem of scarcity could be removed

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[228] *Anarchy, State, and Utopia*, 178, 180.

[229] *Anarchy, State, and Utopia*, 182. In full expression Nozick's argues that

> The theme of someone worsening another's situation by depriving him of something he otherwise would possess may also illuminate the example of patents. An inventor's patent does not deprive others of an object [,]which would not exist if not for the inventor. Yet patents would have this effect on others who independently invent the object. Therefore, these independent inventors, upon whom the burden of proving independent discovery may rest, should not be excluded from utilizing their own invention as they wish (including selling it to others).

by the elimination of patents, as Rothbard recommended. Then, all players would be free to work the market competitively, based on selling consumers on the most efficient means to apply the invention. Unlike Rothbard, who finds the independent inventor problem a ground for vacating the patent system, Nozick believes that multiple licensing rights on the same invention can redeem the justice of patents.

Nozick's solution of multiple ownership of the same patent is untethered to its transactional consequences, where Rothbard's position is not. First, if, following Nozick, multiple patent rights are recognized and made available for licensing by multiple parties, then a patent's status as transferable personal property is damaged. Once multiple patents exist, each patent becomes a poison pill against the other because a license issued for the use of one patent defeats the license issued by another holder. Who would pay for the license-transfer of a patent if a duplicative license could, without objection, be sold to a competitor by another transferor? Nozick reconciles the patent system to his version of the proviso, but he defeats the possibility of practical transfer of the titled property. Nozick has perfected a tragedy of the anti-commons, in which the divisibility (or distribution) of an asset defeats the capacity of anyone to usefully appropriate it.[230] If Nozick has sustained a hypothetically logical position on behalf of justice for the concurrent, non-holding inventor, it is only by spoliation of the commercial institution he is willing to preserve. Rothbard deliberately called for the termination of the patent system, while Nozick would terminate inadvertently.

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[230] See Michael Heller, "The Tragedy of the Anti-Commons: A Concise Introduction and Lexicon," *The Modern Law Review* 76, no.1 (January 2013): 6-35. The commercial life implied by the terms of Nozick's minimal state is generally not examined. Anticommons effects of Nozick's unregulated diffusion of private interests is a problem that not only affects the early interactions of Nozick's protective associations, as Rothbard observed, but will disable responses to externalities related to environmental harm and the rationing of medicine and health services.

Hence, three distinct incongruent positions march under the banner of individual liberty. Rand endorses an aggressive patent system, but condemns government controls, such as antitrust, that would restrain its authorization for monopolies. Rothbard condemns the patent system as an irremediable government invasion of liberty against private ordering: its derogation of liberty for independent inventors is beyond justification. Nozick suggests that the patent system can be de-monopolized and redeemed if non-holding, independent inventors can get a grant equal to the first patentee. To do this, however, he cancels a patent's worth as transferable personal property.

E. Breakaways from Exclusivity

This chapter has explored the difficulties in identifying benefits and measuring social returns from the exclusionary rules of the patent system. The privileges of exclusivity for patent holders generate disabilities for non-holders. Arguments supporting exclusivity based on natural rights cannot overcome the issues of waste and liberty infringement. The previous discussion has by no means defeated the possibility, however, of cooperative and inclusive rules that protect inventors in an entirely different way. A detailed look at some existing institutions that impose rules of sharing on patent holders could point toward a systematic restructuring the rights of holders and non-holders apart from non-cooperative, private society.

Chapter III. Countercurrents Against Exclusivity: Enforceable Sharing

> "Ostrom's Law: A resource arrangement that works in practice can also work in theory." [231]

Patents define but one of three knowledge regimes: an unallocated public domain, private trade secret agreements, and, finally, patents approved by one or more government agencies. The exploitation of a new invention may involve all three. There is no reliable method for advance predictions of where the elements of an innovation may settle among the three precincts. Patents most directly remove a discovery from the public domain, which results in a direct rationing of knowledge. But by limiting the tools of exploration, patents also *indirectly* constrict the exploration of the public domain without directly enclosing it or taking from it. Optimal exploitation of the public domain is impaired by the uncertainties imposed by a patent regime. The public domain prevails only so long as there is abstention from a patenting agency's assignment of power over how an idea may be used.[232]

Congress has opened up breaches in the wall of exclusivity that dominates the patent codes. To be sure there is nothing analogous to the "copyleft" movement that tries to separate scholarship from the controls of copyright. Nevertheless, the patent system includes a loose accretion of legal exceptions and mechanisms that resist exclusivity. Think of them as mutations that could become the dominant traits. Intangible intellectual property is inexhaustible and reusable; unlike a physically resourced commons (fisheries,

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[231] Lee Ann Fennell, "Ostrom's Law: Property Rights in the Commons," *International Journal of the Commons*, 5, no.1(2011): 9.

[232] The notion of the commons defined as a government's abstention is suggested by Charlotte Hess and Elinor Ostrom, " Ideas Artifacts, and Facilities: Information as a Common-Pool Resource," *Law and Contemporary Problems* 66, nos.1/2 (2003): 117-145.

water basins, or grazing pastures) it can have no *naturally* fixed boundaries. Technical art is inherently appropriable by anyone, but politically constructed rules intervene to secure inappropriability. The patent is at once a claim made by an inventor and also an agency's policy for controlling the uses of knowledge. Agency rules divide the world into privileged knowledge holders and disabled non-holders. But the powers of a patent system, as they were explored in Section I.D (A Taxonomy of the State Powers Used Over Discoveries), are highly flexible. Just as public law under a patent code may impose the restrictive rights over ideas and constrain the use of the public domain, it can, as will be illustrated, interpose with ad hoc public rights of open access and sharing.

The first section of this chapter (A, below) identifies required sharing of an invention within regulated systems, where Congress recognizes a public stakehold that would be disserved by exclusionary rules. In this condition the patentee may lose *some* control of its licensing power, but not forfeit all revenue streams from the patent, which are provided by a variety of compensatory schemes. Forms of open, non-restricted licenses reallocate the privilege to make, use, or sell in a government-regulated domain where technologies require approval by the government agency. Such regulatory approvals are made conditional on the patent owner's promise to license petitioners at reasonable royalties to be settled by an agency panel or privately, by binding arbitration, if necessary—in other words, they can provide government-sponsored, shared property regimes with a privately ordered closing of transactions between holders and users. A second breach of exclusivity norms (Section B, below) involves ad hoc action by a federal agency to take (or have its government contractor take) control of a patented art for limited government purposes, subject to a license fee. Regulations treat this activity as a government taking: the

sovereign act in which a government agency directs its civil servants or contractor agents to use a patented product or process but preserves the owner's rights for compensation in a federal court (See I.D.5, supra, on compulsory licensing.) A third breach of exclusivity (Section C, below) occurs where a court invalidates a patent on account of some form of commercial abuse defined by the antitrust statutes or refuses to defend a wrongdoing holder's exclusive rights as a matter of equitable discretion. And finally a fourth type of breach of exclusivity (Section D, below) has been emerging in judicial policies for efficient infringement, in which the courts for reasons of economic and social efficiency reject holders' petitions for injunctions against infringers, but allow them to recover damages. Under this policy non-holders can make an efficient choice between paying damages (or court imposed fees) and avoiding infringing activity within the technical art.

A. Sharing within Regulated Systems: Special Non-Restrictive Licensing

1. Characteristics of Non-Restrictive Licensing Regimes

Suppose a patented compound must be subjected to government testing before its release to the market (e.g., a potentially harmful pesticide) or a patented device must be mated to complex subsystems in a dangerous facility and continuously tested (e.g., a nuclear power plant). The viability of such inventions relies on public resources that make the public an equitable stakeholder in an innovation that can advance only in a regulated setting. Such situations lead to modifications of the exclusive and private rights of the patent holder to make, use, and sell its patented discoveries and require sharing of her holding with the public.

The United States patent code is salted with specialized subregimes that require patent sharing under mandatory licensing rules where public agencies have a regulatory role in a

given technical art. These subregimes share one or more characteristics that distinguish them from agency actions to *take* a private patent for agency use in a non-regulated art:

> First, and foremost, the regimes may assert a general ongoing authority over a domain of technology that operates before an inventor undertakes to invent or apply for a patent. The requirements for sharing are not regarded as constitutional takings of property because the government maintains its dominant interest under regulations of general applicability.
>
> Second, licensing under these subregimes may be initiated by petition to the agency by private individuals and corporations. Citizen petitioners are not guaranteed standing to win a license, but at minimum, they may be heard and have the opportunity to win agency sponsorship for a license.
>
> Third, while in patent takings compensation is determined by the Court of Federal Claims *in trials*, using a standard for compensation based on commercial value or lost revenue, in the subregimes compensation may be established by an agency review with various standards of compensation whose outcome is presumed reasonable and will be sustained *on appeal* so long as it has a rational basis. While the first standard for compensation treats the patent owner as an owner of private property who has suffered a loss, the second standard recognizes the government as a co-occupant of the technology domain and may discount compensation based on the patent owner's cost or risk to develop the invention.
>
> Fourth, as an alternative to an administrative or judicial determination of compensation, some subregimes may direct the patent holder to resolve license disputes privately through negotiation, to be followed by binding arbitration. Hence, the subregimes' regulations may, in some instances, implement a public policy with privately managed remedies.

2. Atomic Energy (Non-Military Uses) (42 USC 2181 et seq.)

Under the Atomic Energy Act of 1954 a regulatory commission holds preemptive power over inventions in nuclear materials technology.[233] The act empowers the commission to revoke prior rights with respect to any invention or discovery to the extent that such an invention or discovery is *solely* for use in operations with

[233] The Energy Reorganization Act of 1974 created the Nuclear Regulatory Commission, which has authority over the uses of nuclear materials.

nuclear materials.[234] New discoveries in this technical domain must be reported to the Nuclear Regulatory Commission by the inventors and additionally by the patent office prior to the granting of any patents.[235] The distribution of rights for prior and future patents, useful in the production or management of nuclear materials and conceived in the course of regulated activity becomes subject to NRC regulations.[236] Any patent is subject to the NRC's declarations of public interest whereby

> The Commission may, after giving the patent owner an opportunity for a hearing, declare … (1) the invention or discovery covered by the patent is of primary importance in the production or utilization of special nuclear material or atomic energy; and (2) the licensing of such invention or discovery under this section is of primary importance to effectuate the policies and purposes of this chapter.[237]

After such a declaration "any person may apply to the Commission for a nonexclusive patent license to use the invention or discovery covered by such patent, and the Commission shall grant such patent license to the extent that it finds that the use of the invention or discovery is of primary importance to the conduct of an activity … under the [Act]."[238] Licenses granted are immune from attack by infringement injunctions.[239] Patent owners and authorized licensees are encouraged to privately determine royalties,[240] but failing a private ordering, compensation is determined, not by a court, but administratively,

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[234] 42 U.S.C. 2281 provides "Any rights conferred by any patent heretofore granted for any invention or discovery are revoked to the extent that such invention or discovery is so used, and just compensation shall be made therefor."

[235] 42 U.S.C. 2182.

[236] Ibid.

[237] 42 U.S.C. 2183.

[238] 42 U.S.C. 2183 (b)(2).

[239] 42 U.S.C. 2184.

[240] 42 U.S.C. 2183 (g).

by the Commission's Patent Compensation Board.[241] Recovery of lost profit is not the standard for computing reasonable compensation, and the board may also consider the cost of invention development in determining a fair royalty.[242] Judicial review is available,[243] but Commission findings enjoy strong presumptions of validity so long as the agency's record of decisions does not expose an abuse of discretion or a failure to observe appropriate on-the -record hearing procedures.[244] Contrary to normal conditions under the patent code, the subregime for nuclear materials, as well as the inventions that assist in their production and use, prohibits the transfer of licenses.[245] In this subregime the Commission controls all uses of devices relying on the patent.

3. Clean Air Technology (42 USC 7608)

The Clean Air Act Amendments of 1970 confronted the problem that investments to reduce emissions might not produce benefits that are observable for consumers and might fail to motivate industry to incur the expenses of environmentally sound practice.[246] There is no market for clean air, and in competitive businesses the use of clean air technology is an expense that may not be recoverable in the pricing of finished goods. The problem moved Congress and the president to impose limits on polluting emissions. They recognized, further, that the system of environmental controls created a danger that certain

[241] 42 U.S.C. 2187.

[242] Ibid.

[243] 42 U.S.C. 2239.

[244] 28 U.S.C. 2342 and 7 U.S.C. 706 (Enumerating more specifically where a court may reject agency action).

[245] 42 U.S. 2234 (Inalienability of Licenses).

[246] For a discussion of this policy mechanism see Guido Calabresi, "Transaction Costs, Resource Allocation and Liability Rules–A Comment," *Journal of Law and Economics* 11 (1968):67.

companies that were well-positioned to acquire patents and develop or purchase trade secrets might rapidly accumulate market power to make the cost of hardware for compliance so expensive as to create resistance to investment. Accordingly, anti-monopoly legislation sought to give space for market entry by capable firms that might lack all the pieces of a useful technology but could aggregate good hardware with patent barriers lowered. The Act devised mandatory licensing procedures to allow the EPA Administrator (on his own or after a request from a citizen petitioner) to ask the Attorney General to move the United States District Court to order the licensing of a patented invention.[247] To get to the courthouse, petitioners present data and findings that the license sought meets a technical need for clean-air compliance, that other devices are not satisfactory, and that the patent holder is positioned, potentially, to monopolistically restrain competition. The role of the Attorney General in this process is to evaluate the competitive disadvantage to the public, not the technical need, before the Court order is sought. The statute leaves it to the District Court to establish standards and methods for reasonable compensation of a patent

[247] The law (42 U.S.C. 7608) provides:

Whenever the Attorney General determines, upon application of the Administrator—

(1) that—

(A) in the implementation of the requirements of … this title, a right under any United States letters patent, which is being used or intended for public or commercial use and not otherwise reasonably available, is necessary to enable any person required to comply with such limitation to so comply, and

(B) there are no reasonable alternative methods to accomplish such purpose, and

(2) that the unavailability of such right may result in a substantial lessening of competition or tendency to create a monopoly in any line of commerce in any section of the country,

the Attorney General may so certify to a district court of the United States, which may issue an order requiring the person who owns such patent to license it on such reasonable terms and conditions as the court, after hearing, may determine. Such certification may be made to the district court for the district in which the person owning the patent resides, does business, or is found.

owner.[248] Under the potential pressure of this process, patent owners may be moved to conclude private negotiations for a license rather than litigate.

4. Public Dedication of Black Lung Inventions (30 USC 937*)*

For the purpose of combating black lung disease, Congress created a patent regime based on public dedication—prohibiting contractors and grantees from taking any proprietary interest in inventions arising from federal research funds.[249] In effect Congress made this zone of technology unpatentable, similar in some respects to the rules that made pharmaceuticals and medical devices unpatentable at mid-20th century in many nations. In this case, public dedication of disease preventing technologies was a condition of receiving government funds. The statute rewarded a patentee with public credit and goodwill, but the privilege to restrict use was barred.[250] Implicit in the public dedication scheme was the notion that compensation for research and development costs would be an adequate incentive for investment. The inventor, once supported by grants or contracts, had a possible economic advantage of being the first mover, whose head start could discourage competition effectively in a closely defined market, but no power to exclude competition.

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[248] 42 U.S.C. 7608(2). Some methodologies of royalty determinations are treated later in this dissertation at IV.E.4 and Chapter IV, Appendix.

[249] Various types of respirators and airstream helmets were being proposed for prevention of the disease.

[250] 30 U.S.C. 937 provides:

(b) Research activities:

The Secretary of Health and Human Services shall initiate research within the National Institute for Occupational Safety and Health, and is authorized to make research grants to public and private agencies and organizations and individuals for the purpose of devising simple and effective tests to measure, detect, and treat respiratory and pulmonary impairments in active and inactive coal miners. Any grant made pursuant to this subsection shall be conditioned upon all information, uses, products, processes, patents, and other developments resulting from such research being available to the general public.

As shown below, public dedication is not a customary condition of government-sponsored research.

5. Bayh-Dole Sponsored Research for Government Contractors (35 USC 200)

To promote the interests of innovators working under agency contracts, Congress in 1980 passed a major amendment to the Patent and Trademark Act, dubbed "Bayh-Dole" after its two Senate sponsors. It provides legal clarity for title to inventions made with government agency funds for contractors that are universities, small businesses, or non-profit research institutions. When invoking Bayh-Dole, the government, as funder and sponsor, sets aside its otherwise unchallengeable right to preclude vesting of patent rights with its contractors or grantees. With their Bayh-Dole patent rights in hand, the funded organizations can play in the private market as commercial venturers and build proprietary sources of revenue for operations and new research. The consideration that a contractor must return to government for these privileges is usually minimal. The fund recipient must disclose a new invention to its appropriate government contracting or grant officer, make a formal election to retain title to a patent, apply promptly for the patent or forfeit control of the patent to the government, and recognize the government's irrevocable, paid-up license to practice the patent on behalf of its own agencies.[251] All Bayh-Dole licensors and licensees must promise that the invention will be made substantially in the United States.[252] The law contains an important proviso, called "march-in rights," that is designed to discourage nonuse of the patent. It requires the patentee *to consider* responsible

[251] 35 U.S.C. 202c(4).

[252] 35 U.S.C. 203 (a)(1) and 35 U.S.C. 204. These latter provisions, for U.S. manufacturing requirements, are arguably in violation of the requirements of WTO general agreements and the TRIPS appendix because they create discriminatory trade advantages for a class of United States institutions. Brazil and other states have threated to challenge Bayh-Dole in the WTO disputes settlement process, but no mature action has arisen.

applications from third parties for licenses, including exclusive licenses, in an applicant's particular field of use.[253] The holder does not lose the privilege to reject the applicant. Failure to grant such a license, however, can result in an agency's "march-in" to issue a compulsory license, if the granting agency decides that the patent holder has not taken (or is not able to take) effective steps to achieve a practical application of the invention. Compulsory licenses are also available to alleviate a public health or safety need that is related to the protected technical art but that is not being reasonably addressed by the contractor.[254] Relief under this proviso would be akin to a license compelled as a result of nonuse or non-manufacture within the United States.[255] March-in rights as a formal mechanism could be a powerful policy tool, but as of August 2016 no federal agency has ever granted march-in rights. Supporters of the liberal use of a strengthened regime of march-in rights observe that they might be used to counter high drug prices where Bayh-Dole patents arise from drug development work at universities or the National Institutes of Health. Opponents of the liberal use of march-in rights warn of chilling the environment for venture collaborations if contractors and grantees fear that "march-ins" could unsettle their public-private arrangements.[256] The existence of the march-in mechanism has importance, notwithstanding its latency, because it moves in the direction of cognizable public claims on patents. Other collaborative mechanisms can be relied upon by agencies

[253] 35 U.S.C. 203 (a) ("March -in Rights").

[254] 35 U.S.C. 203(a)(2).

[255] If a contractor were to challenge an adverse agency action that ordered march-in rights against its interest, it would appeal to the United States Court of Federal Claims, where monetary relief in addition to reversal of the order might be available depending on the circumstances of the determination.

[256] See Report of the Congressional Research Service (RL 44597) "March-In Rights Under the Bayh-Dole Act," August 2016, accessed November 19, 2018. https://fas.org/sgp/crs/misc/R44597.pdf .

that do use contract or grant vehicles with march-in provisions. Federal agencies have authority to enter into joint development agreements with private companies for collaborative use of government research facilities and laboratories. These allow for private patents with fully paid up nonexclusive licenses to U.S. agencies. Agreements under these authorities are called "CRADAs" (Cooperative Research and Development Agreements), authorized under the Stephenson-Wydler Act, 15 U.S.C. 3710(a)(3). CRADAs can be awarded non-competitively, unlike regular procurements of goods and services, and they do not provide for nonparties to petition for patent licenses, unlike Bayh-Dole. Accordingly, CRADAs are not treated in detail in this discussion.

6. Food Supply/Plant Varieties (7 USC 2404)(Experimental Research)

Plant varieties are governed by two distinct rule sets. The patent office under the Plant Patent Act administers protection of asexual varieties from grafting and budding,[257] while the Department of Agriculture administers exclusionary rights to sexually produced seed varieties under the Plant Variety Protection Act (PVPA).[258] Of particular interest in this discussion is the latter's special statutory terms that provide automatic licensing for experimental research. "The use and reproduction of a protected variety for plant breeding or other bona fide research shall not constitute an infringement of the [other] protections provided" under PVPA. "[259] Compulsory licensing for non-experimental use is also

[257] 35 U.S.C. 161-164.

[258] 7 U.S.C. 2321.

[259] 7 U.S.C. 2544 (PVPA). By contrast see the rules for utility patents, discussed , I.C.6. (Prohibiting Experimental, Non-Commercial Research). PVPA provisions cited here have an international correlate. The International Treaty on Plant Genetic Resources for Food (ITPRG) provides for the pooling of genetic varieties of 64 species of plants that constitute, through food or feed, 90% of the worlds calorie throughput. Exchange of these genetic materials for experimental research purposes is guaranteed among the treaty signers. ITPRG goes further however. Commercial exploitation of genetic material is subject to negotiation

provided. Where the department has certified a plant variety, the certificate holder ordinarily has a right to seek damages for infringement in the federal courts as determined by a judge or in a jury trial. [260] Exceptionally, however,

> [T]he Secretary may declare a protected variety open to use on a basis of equitable remuneration to the owner, not less than a reasonable royalty, when the Secretary determines that such declaration is necessary in order to insure an adequate supply of fiber, food, or feed in this country and that the owner is unwilling or unable to supply the public needs for the variety at a price which may reasonably be deemed fair.[261]

For compulsory licensing, the statute directs that fair remuneration will be determined by the agency, but subject to limited review at the appellate level in the U.S. Court of Appeals for the Federal Circuit. Unlike most patents that have an interpretive cloudiness as to their scope, plant varieties can be precisely identified, and protection is extended to an exact and unique variety.

7. Pesticides (7 USC 136-136y) (Public Rights and Private Ordering)

The Supreme Court has held that Congress has the power to authorize an agency administering a complex regulatory scheme to allocate costs and benefits among voluntary participants in a program.[262] Such schemes can alloy private property rights with government-imposed limitations on the remedies for violations of those rights. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is such a scheme. It provides for the compelled sharing of trade secrets (not patents) and the private ordering of compensation.

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of a sharing contract in which the using party must settle payment from commercial proceeds. See ITRPG, accessed January 19, 2019, http://www.fao.org/plant-treaty/en/.

[260] 7 U.S.C. 2464, 2565.

[261] 7 U.S.C. 2404 . The statute contemplates fair remuneration will be determined by the agency, but subject to appeal at the appellate level in the Federal Circuit. 7 U.S.C. 2461.

[262] Thomas v. Union Carbide, 473 U.S. 568, 589 (1985).

The scheme is pertinent to this discussion because a) its mechanics are adaptable to patents; and b) trade secrets, like patents, constitute protectable property interests under federal laws.[263]

Newly discovered chemicals, special uses for known chemicals, and new processes for the manufacture of known chemicals are the basis for patents. Accordingly, pesticide manufacturers in the regular course may use these discoveries to apply for patent protection from infringement for 20 years. The process of obtaining a license from the Environmental Protection Agency for the use of pesticides, however, requires much more. The registration and certification of a new pesticide to allow its sale involves a battery of submittals regarding proof of safety. Once a patent expires, the law allows other parties to seek registration as new producers of the same formula. Under amendments to FIFRA Congress has established data-sharing provisions to streamline pesticide registration for follow-on sources (called "me-too" registrants in the trade), to increase competition and avoid the duplicative costs of generating redundant data that re-demonstrates that the formula meets a safety threshold. However, Federal law recognizes that such data can be a trade secret for which originators have enforceable interests. Unauthorized disclosure of trade secret data can violate criminal laws that can penalize government officials who disclose secrets that are entrusted to an agency. [264] Statutes and regulations can authorize distribution of such

[263] 18 U.S.C. 1905 "The Trade Secrets Act" prohibits a Government employee from "publish[ing], divulge[ing], disclose[ing] or make[ing] known" confidential information received in his official capacity. It applies not only to the malfeasance of a rogue government employee, but also to formal official agency actions that are approved by department heads. Chrysler Corp. v. Brown, 441 U.S. 281, 298–301(1979).

[264] Ibid.

data for the use of others, but such data distribution must be treated as a taking that the government must compensate.[265]

FIFRA recognized that public rights would disturb the private interest in trade secrets within this regulated domain. Hence, as a condition of approval and registration of a pesticide, submitters of data are required to recognize that the secrecy of their data may be breached, and agree that such breaches will be compensated.[266] Under regulations, following submittal, EPA gives registrants a term of exclusive control of data (10 years) after which EPA may provide the data to new registrants to incorporate in their applications for registration, anticipating that the new applicant and earlier submitter can reach terms that compensate for the generation of the submitter's data. If the applicant and the data submitter fail to agree, a party may invoke binding arbitration under the American Arbitration Association's standard commercial rules that are published in the *Code of Federal Regulations* so that they have legal force under FIFRA's scheme.[267] The scheme contains sanctions. If a new applicant does not comply with the requirement to negotiate and arbitrate if necessary, the new application is canceled. If the original submitter does not cooperate, EPA's administrator may use the data to advance the new application without any compensation to its originator.[268]

When the scheme was devised, industry parties filed suit against these regulations, arguing that Article III of the Constitution required resolution of compensation by the federal system's life-tenured judges, not binding arbitration. While the court had shown

[265] Ruckelshaus v. Monsanto, 467 U.S. 986, 1018 (1984).

[266] Thomas v. Union Carbide Agricultural Products, 473 US 568.

[267] 29 CFR Part 1440.

[268] 7 U.S.C. 136(a)(c)(1) (F)(iii).

sympathy to such arguments where private contracts and state-created rights were in dispute,[269]with regard to matters arising under complex federal regulations, and specifically FIFRA, the Supreme Court ruled that binding arbitration was acceptable. If EPA were not to implement this structured compensation scheme in its entirety, then claims for compensation could be heard at the United States Court of Federal Claims, as they are with some of the other forms of compulsory licensing discussed in this chapter.[270] The implications and possibilities for adaptation of this remedial scheme for the patent system generally are discussed later.

8. Experimental Uses in Pharmaceuticals

With limited exceptions, performing experiments on products and processes for research and development infringes a patent. Accordingly, the patent owner retains the best opportunities to improve a patent and hold competitive advantages beyond the initial patent term. In the early 19th-century American common law recognized an experimental use exemption to infringement liability. Early decisions reasoned that "philosophical experiments" for the edification of the user of the device or practical testing to see if a machine could meet the claims of its seller should not be infringements.[271] Over time cases became increasingly rigorous to assure that these limited exceptions could not be exploited for commercial advantages. So, for example, if a drug maker began development of a generic version of a patented compound in anticipation of approval for a generic equivalent when the patent expired, its arguments against infringement liability would fail. The courts

[269] Northern Pipeline Construction Co. v. Marathon Pipe Line Co., 458 U.S. 50 (1982)

[270] Thomas v. Union Carbide Agricultural Products, 473 US 568, 585.

[271] Whittemore v. Cutter, 29 F. Cas. 1120,1121 (Justice Story).

refused to recognize the notion of non-infringing experimentation, nor be moved by the argument that an urgent public policy favored access to generic drugs.[272] Non-profit entities also came to be disfavored in their attempts to use experimental exceptions.[273] Under case law, the old experimental use exception lacked reliability without support of statutes. At least in the limited domain of pharmaceuticals, Congress found the anti-experimentation doctrines too strict: it responded with case law with some statutory space for pharmaceutical developmental uses.

An experimental use regimen, commonly known as Hatch-Waxman for its sponsors, now provides a safe harbor against infringement for developers of generic drugs and for second sources for medical devices.[274] Hence, in this domain a firm may engineer competing versions and prepare necessary accompanying data while a patent continues to protect the market for the commercially available versions of the formula. The act includes reciprocal benefits for the originating pioneer patentees while generic makers are experimenting and preparing for their market entry. Patent holders are allowed to petition for a patent term extension when regulatory reviews for a pioneering product were lengthy. An informal case-by-case rulemaking process determines the worthiness of an extension for a period not to exceed five years.[275]

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[272] Roche v. Bolar, 733 F.2d 858 (Fed. Cir. 1984).

[273] Madey v. Duke University, 307 F.3rd 1351 (Fed. Cir. 2002). See Note 89, supra, for how the limits are defined by the courts.

[274] The Drug Price Competition and Patent Term Restoration Act, P.L. No 98-417 (1984), codified at 35 U.S.C. 271(e)(1) "It shall not be an act of infringement to make, use, offer to sell, for sale within the United States or import into the United States a patented invention… solely for use that is reasonably related to the development and submission of information under a federal law which regulates the manufacture, use, or sale of drugs or veterinary biological products."

[275] 35 U.S.C. 156. The Act restores a portion of the patent term during which the patentee is unable to sell or market a product while awaiting government approval (for example, during Food and Drug Administration

What may be most notable about this special experimental use system is its illustration of the flexibilities within the patent code to construct rules based on particular detriments to pioneer inventors while lessening the disabilities of second-source suppliers where the public importance of new sources is strong. While it may be debated whether the Hatch-Waxman scheme adequately stimulates market entry for generic drugs, its mechanisms for adjusting property interests in patented articles have been stable and well operationalized.

9. Past United States Considerations of General Non-Restrictive Licensing

Outside of the special regimes United States law rejects a general right of open licensing that the international framework has at times encouraged, but the rejection has not been without debate. Deliberation in the U.S. Congress in the pre-WTO TRIPS era saw consideration of two types of measures for the general promotion of patent sharing: one voluntary and one not. Although no single measure was ever taken up by both of the chambers, the judiciary subcommittees on patents, trademarks, and copyrights of both chambers held extended hearings to take the temperature of corporations and the research community on mandatory shared licensing.

In 1926 Congress gave consideration to bills to require non-voluntary licensing to combat patent blocking and to take down the stronghold of privilege of nonuse, which was fortified by the Supreme Court's 1908 foundational defense of exclusivity in *Continental Paper Bag,* discussed and cited earlier.[276] These bills were structured around a show-cause mechanism and fell within the zone of authorized optional national legislation under the

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review), subject to an evaluation of the patentee's diligence in moving the product toward regulatory approval.

[276] I.D.1, 50.

Paris Convention on Industrial Property. According to one proposal advanced in the Senate, patent holders who, five years after issuance, failed to license or exploit a patent could be required to show cause why licensing should not be compelled or patents should not be revoked.[277] More aggressive burden shifting to patent owners was advanced in a 1938 bill that hybridized exclusivity with a shared property regime that provided for exclusive licensing for a period of three years, after which any person could file for a license to be granted by the Commissioner of Patents upon showing financial responsibility to manufacture the invention, providing statements showing that a compulsory license would advance the public interest, and offering reasonable terms, conditions, and royalties, regarding which the commissioner could hold a hearing for settlement of licensing terms, that was subject to administrative appeals.[278] The bill gained little traction; its mechanics, which were referred to as "across-the-board licensing," were attacked for providing only a skimpy period of exclusivity that would encourage secrecy and the hiding of inventions.[279]

Members of the Senate in 1942 advanced bills for the prevention of abuse and nonuse, on the template of optional procedures under Section 5A of the Paris Convention. This provision created a public right for any person to petition seeking a justification for a holder's nonuse, as well as hearings to challenge rejection of fair offers to pay licensing fees. The commissioner would have been authorized to impose licensing and compensation terms to the patentee.[280] Beyond hearings, the Senate did not act.

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[277] Discussed in *Compulsory Licensing of Patents—a Legislative History,* 8. (S. 3474 (69th Cong), March 9, 1926 (Sen. King)).

[278] Ibid. , 9-11, (H.R. 9259 (75th Cong) January 31, 1938 (Rep. McFarlane)).

[279] Ibid.

[280] Ibid., 9-14. S. 2491 (77th Cong), April 28, 1942, (O'Mahoney-Bone-LaFollette).

Finally, the House Judiciary Committee in 1945 advanced a system-wide structure of shared licensing under a voluntary registration system. It allowed a patentee to register an invention as available for licensing with an option to specify terms and conditions for such licenses. But once so volunteered, the determination of licensing terms was to be in the hands of the Commissioner of Patents. The bill provided:

> In the event the offerer of a license under a patent upon the register refuses or fails to grant a license to a person seeking the same, the applicant for license may apply to the Commissioner of Patents and the Commissioner is empowered after notice and opportunity for hearing, to fix reasonable terms and conditions thereof to the extent they are not stated in the offer and the parties have been unable to agree thereon, and thereafter to order a license, the terms and conditions of which shall be binding upon the parties.[281]

The objective of the bill was to help inventors who were not familiar with markets and potential applications of their ideas and to assist manufacturers in knowing the state of relevant art.[282] At hearings the Department of Justice favored the proposal, subject to the Commissioner's findings being subject to appeal at the then active U.S. Court of Customs and Patent Appeals.[283] The proposal received qualified approval from the American Bar Association section on patent, trademark, and copyright as well as from the New York Patent Law Association. After successful report from the committee, a slightly amended version of the original bill passed the House of Representatives from the House consent calendar without debate or prospect to advance to the other chamber. This action was not a threat to the prominence of voluntary, non-compelled licensing, but it reflects the

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[281] Study of the Subcommittee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, United States Senate. *Compulsory Licensing of Patents—a Legislative History* (Washington D.C: U.S. Government Printing Office, 1958),27-31. (summarizing deliberations on H.R. 2630 (79th Cong.) March 15, 1945 and H.R. 3757 (79th Cong). July 11, 1945.

[282] Ibid. 29. Statement of Congressman Fritz Lanham, February 18, 1946, 92 Congressional Record 1432.

[283] Ibid. 27. Testimony of John Stedman for the Department of Justice.

confidence at that time from agencies and Congress that a government mechanism to administer shared patents was feasible—particularly if its administrative practices were designed for efficiency and subject to a speedy and narrow "rational basis" standard of judicial review, commonly used for administrative action.

B. Ad Hoc Compulsory Licenses: Patent Takings

The non-restricted licensing mechanisms described in subsections 1 through 8 of the last section are specific to fixed regulatory schemes. Compelled licensing by an agency, however, may also be ad hoc and stem from a particular emergent requirement of an agency. Typically, an agency action to take control of a patent does not provide for public dedication or a transformation of the patent into a public or collective good that can be liberally appropriated. It is, rather, a cutback of a patentee's privileges akin to an exercise of an easement or right of access taken by eminent domain over part of a holding of real property. Accordingly, outside of government transactions and uses, the holder can exercise its private privileges and remedies for infringement without hindrance from an agency. The patent owner remains substantially, if not entirely, free to play the marketplace and voluntarily engage in or restrict its transactional space.

The rules and remedies behind the power of an agency to compel licensing are a joinder of principles of public franchise and private property rights. Chapter I observed how legal policy has brought intangible property under the same constitutional umbrella as rights in land. When the law observes that patents carry the same privileges of ownership that are associated with land and other personal property, it implies a right of compensation for

subjecting the holder to a non-voluntary use.[284] Before 1910 a patent owner in the United States had no assurance that she would receive compensation for a patent that was used by or for the government. Despite implied constitutional entitlement for compensation for taken property, the doctrine of sovereign immunity from lawsuits closed the courthouse to claims against the sovereign by members of the public, except where there had been a legislative waiver that authorized a court's jurisdiction. To that time, suits against the government could proceed where there was an express or implied contract between the citizen and the United States. In claims not arising from contracts, an aggrieved citizen needed to obtain an appropriation by special legislation to compensate for a patent taking. In the event that special legislation was blocked, a patent claimant could conceivably have a right without a remedy. Congress passed a waiver of immunity for patent takings claims, removing the need for special case-by-case legislation, and creating a standing judicial forum to hear a patent holder's claim for compensation for the government's appropriation of a patent or a license. It made the forum, process, and monetary remedies for agency takings of intangible property the same as those for federal takings of land.[285]

[284] See the discussion of *Continental Paper Bag*,_I.C.1 supra. See also 35 U.S. Code § 261 - Ownership; assignment ("patents shall have the attributes of personal property."). The code follows the holding of an old case, *James v. Campbell*, 104 U.S. 356, 358 (1882) ([A patent] "confers an exclusive property in the patented invention, which cannot be appropriated or used by the government itself, without just compensation, any more than it can appropriate or use without compensation land.") The authority of the holding in *James* has been lately reasserted by the Supreme Court in *Horne v. Department of Agriculture, (no. 14-375),* 135 S.Ct. 2419 (2015). Horne itself was not a patent matter, but treated takings of personal property (raisins seized under the Department's California Raisin Marketing Order). In this recent conclusion that the government had unconstitutionally taken personal property without compensation, the Court reached back to James, the19th-century patent case, for authority that the strength of protection of personal property under the Constitution should continue to be no less than that of land. These cases coupled with the Oil States case discussed in the introduction to this study exemplify the mixed and ambiguous characterizations applied to patents *qua* property in United States courts.

[285] 28 U.S.C. 1491 (amending the 1887 Tucker Act that had provided limited waivers of sovereign immunity in cases of direct contracts with agencies).

Congress soon extended the waiver of sovereign immunity under 1918 amendments to the judicial code with a "by or for" provision that allowed patent owners to sue in the United States Court of Claims when a patent was exploited directly *by* government agency employees or *for* an agency through an agency's contract to a private firm. Where work had been done "by or for" the government, the 1918 enactment provided that the sole compensation for a patent owner would be the amounts secured in the United States Court of Claims. [286] Government contractors would, therefore, no longer be suable by the holder for infringement because the new statute created virtual, non-voluntary licenses on their behalf. [287] When a government contractor infringed, the holder's grievance would be with the United States in its special claims forum.

The new statute began to shape agency action in both emergency and non-emergency scenarios. Its uses were illustrated in government-industrial relations in the military aircraft industry during World War I and after. Congress appropriated $15 million for aircraft purchases in 1916, but patent-blocking disputes among 15 aircraft producers stalled

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286 §1498. Patent and copyright cases (as amended, 1998):

(a) Whenever an invention described in and covered by a patent of the United States is used or manufactured by or for the United States without license of the owner thereof or lawful right to use or manufacture the same, the owner's remedy shall be by action against the United States in the United States Court of Federal Claims for the recovery of his reasonable and entire compensation for such use and manufacture….

For the purposes of this section, the use or manufacture of an invention described in and covered by a patent of the United States by a contractor, a subcontractor, or any person, firm, or corporation for the Government and with the authorization or consent of the Government, shall be construed as use or manufacture for the United States….

A Government employee shall have the right to bring suit against the Government under this section except where he was in a position to order, influence, or induce use of the invention by the Government. This section shall not confer a right of action on any patentee or any assignee of such patentee with respect to any invention discovered or invented by a person while in the employment or service of the United States, where the invention was related to the official functions of the employee, in cases in which such functions included research and development, or in the making of which Government time, materials or facilities were used.

287 A government agency can seek an indemnification from one of its contractors for the compensation it pays a holder when it believes that the infringement on its behalf was undertaken without its authorization and consent.

production of aircraft that could integrate up-to-date technologies for the military. When two of the leading producers, Wright-Martin and Curtis, continued to make cross-demands for high royalties in a game of competitive chicken, Congress authorized and appropriated additional money for the government's compulsory acquisition of their patents. Pressed to act under the cloud of imminent government control over their military production, the manufacturers worked with the National Advisory Committee on Aeronautics,[288] the precursor of NASA, and proposed the sharing of patents for aircraft structures (instruments and engines not being the sticking point) among all firms that joined the pool. These manufacturers agreed to fixed license fees until the pertinent patents expired in 1933.[289] To accelerate the flow of patented technology for the entire industry, Congress made a further intervention to authorize an industry-wide patent pool to keep patent disputes from interfering with the national war mission. Manufacturers within the pool could freely cross-license selected technologies, acting through a private patent holding company, the Manufacturers Aircraft Association, thereby holding each other harmless. Under this arrangement entities

[288] As reported by the Official History of the National Aeronautics and Space administration:

> The National Advisory Committee for Aeronautics (NACA) came into being in response to the success of others. Even though the Wright brothers had been the first to make a powered airplane flight in 1903, by the beginning of World War I in 1914, the United States lagged behind Europe in airplane technology. In order to catch up, Congress founded NACA on 3 March 1915, as an independent government agency reporting directly to the President. While not originally intended to administer its own laboratories, NACA's expanding role led to the creation of its first research and testing facility in 1920, the Langley Aeronautical Laboratory. NACA's personnel expanded as well. The new laboratory employed a staff of 11 technicians and 4 professionals and, by 1925, the staff had grown to over 100 employees.

Accessed October 21, 2018, https://history.nasa.gov/naca/overview.html .

[289] Each member producer paid a $1000 initiation fee to join the pool and thereafter paid $200 for each airplane built, with $135 going to Wright-Martin , $40 to Curtis and $25 toward administration of an aircraft association pool. Floyd L. Vaughan, *The United States Patent System* (Norman OK: University of Oklahoma Press, 1965) 64. For a top-level discussion of the heritage of patent pooling in the United States and the capacity of privately ordered pools among inventor-combatants to bust a thicket of patent blocking, see Adam Mossoff, "The Sewing Machine Patent Wars," *Slate* (December 3, 2013), accessed January 20, 2019, https://slate.com/technology/2013/12/sewing-machine-patent-wars-of-the-1850s-what-they-tell-us-about-the-patent-system.html.

outside the pool would have to sue in the Court of Claims for any infringements related to military aircraft production. Accordingly, there was no need for time-consuming negotiation with non-pool independents. Transactions that were "within pool" were privately ordered under a government umbrella, while those "without pool" would be resolved as transactions "by or for" the government under procedures of recent laws. Outliers, like Ford Motor Company, which chose not to participate in the pool, were forced to surrender voluntary control of their patents and rely on the Court of Claims for payment—a slow, expensive, and competitively disadvantageous process for most of the other participants in a dynamic sector. [290]

In a more recent emergency scenario, the Secretary of Health and Human Services and members of Congress threatened to put the drug patent for the antibiotic Cipro under compulsory license for the emergency manufacture of mass dosages against anthrax when the government perceived threats of contamination of the United States mail in 2001. Faced with the threat, the patent holder agreed informally to mobilize accelerated production at lower than ordinary prices.[291] In Canada, the government took formal aggressive action to

[290] Vaughan, *The United States Patent System*. 65. The "inside-out" redistributions of power in the episode leading to the creation of the aircraft patent pool can be traced as adjustments of traditional Hohfeldian correlations. The customary *Privilege* of private voluntary licensing is converted, after threat of a taking, from a privilege into a *No-Right* to control such licensing. Second, non-owner *Liability* for infringement of key patents is transformed into a *Power* to use. Finally, with the formation of the approved patent pool, *Immunities* from infringement suits create *Disabilities* for non-pool independents that would otherwise seek to privately enforce their own patents and sustain their private monopolies.

[291] For a review of circumstances see Matt Fleisher Black, "The Cipro Dilemma – In the Anthrax Crisis," *The American Lawyer,* January 2002, accessed October 29, 2018 . http://www.cptech.org/ip/health/cl/cipro/americanlawyer012002.html .

temporarily seize the patent so its health agencies could be on the ready to contract for drug production by non-holders.[292]

Emergencies aside, the power of compulsory licensing— as a normalized shared property routine—is part of the boilerplate of agency procurement of goods and services under the Federal Acquisition Regulations.[293] When a contractor enters into an agreement the standard terms and conditions of the FAR provide to the contractor an "authorization and consent" to bypass negotiation with the holder for patent rights—a ticket to trespass. This notifies the "trespassing" contractor of its immunity from injunctive suits by a patent holder under sections of the judicial code cited earlier. A federal agency, entities under contract to the agency, and their subcontractors cannot be enjoined from using a patented article or process. The regulations authorizing the insertion of such terms into government contracts summarize the rights of parties:

> The exclusive remedy for patent or copyright infringement by or on behalf of the Government is a suit for monetary damages against the Government in the Court of Federal Claims. *There is no injunctive relief available, and there is no direct cause of action against a contractor that is infringing a patent or copyright with the authorization or consent of the Government* (e.g., while performing a contract).
> (b) The Government may expressly authorize and consent to a contractor's use or manufacture of inventions covered by U.S. patents by inserting the clause [titled] "Authorization and Consent."[294] (Emphasis supplied)

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[292] Amy Harmon and Robert Pear, **"**A Nation Challenged: Canada Overrides Patent for Cipro to Treat Anthrax," *New York Times*, October 19, 2001, accessed October 29, 2018, https://www.nytimes.com/2001/10/19/business/nation-challenged-treatment-canada-overrides-patent-for-cipro-treat-anthrax.html.

[293] The Federal Acquisition Regulations, called the FAR system, comprise rules with the force and effect of general law that govern purchases of good and services. The FAR system supports general acquisition principles, as well as rules specially tailored to the needs of agencies, in special supplements such as the DOD FARR or GSA FAR. Title 48 of the Code of Federal Regulations codifies the basic system and it supplements.

[294] Code of Federal Regulations, Title 48, § 27.210-1. The judicial code at 28 U.S.C. §1498, cited and quoted above does not characterize use "by or for the United States" as an infringement, but simply identifies a remedy for non-licensed use. The regulations, as quoted above, do characterize "by or for" uses as potential infringements, however.

When acting under the protection of this regulation, adjustments of the patent owner's rights will occur *after* an infringement, and such a patent owner in some cases may have to deal with ongoing infringements by multiple parties. The agency may not always extend authorization and consent to its contractors. Under those circumstances the patent-using contractor, under agency contract, who acted for the government may have to reimburse the government agency for infringement costs if the Court of Claims finds that authorization and consent terms were not part of the contract. Nevertheless, even in that case, the protection from prohibitory injunctions is fixed and across the board whether or not the clause is incorporated. No patent holder can enjoin continuing performance of a government contract. The holder's remedies are exercised after use occurs—the light is always green to proceed and perform for the government. The government agency can routinely nullify the patentee's private rights of voluntary licensing and pre-use negotiation when transactions involve an agency and its contractors. [295] A similar remedial structure for takings by an agency applies to copyright cases.

Patent and copyright claims against the United States occur regularly; as of September 30, 2017, there were 31 cases at the U.S. Court of Federal Claims covering both areas of intellectual property. The patentee may seek money compensation principally in the form of a "reasonable royalty." Such compensation is computed as "the amount that a person desiring to manufacture or use a patented article, as a business proposition, would be willing to pay as royalty and yet be able to make or use the patented article in the market at a reasonable profit." Often there is readily available data to support such computation, but

[295] Ibid. §§ 52.227-1; 52.227-3; 52.227-4.

at other times the data must be imputed and estimated under legal tests examined more in the next chapter. [296]

A patent holder's remedies may differ when the government actor is a state government or state agency. States enjoy a robust immunity from suits for money damages for patent and copyright infringement under constitutional doctrines that protect the sovereign immunity of states under the 11th Amendment.[297] Such immunity does not, however, necessarily extend to municipalities or to private contractors to state agencies, where the varieties and permutations of localities' liability are affected by state constitutions and their local government structures.

One further instrument of government compulsion over privately generated inventions, in family with the compulsory license, remains to be briefly considered: the patent secrecy order, which can intercept a patent application before publishing or bar introduction of an invention into the marketplace and comprehensively control its use. The Invention Secrecy Act of 1951 bars the disclosure of new inventions that, upon a review by specified

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[296] Wright v. United States, 53 Fed. Cl. 466 (2002). This amount is augmented under 28 U.S.C. 1498 which defines "reasonable and entire" compensation to include expert witness and attorney fees as well as the royalty determinations, which are the core of a compensatory judgment. Opinions treating the standards of reasonable compensation note that these determinations may depend on reasoned speculation, not facts:

> When an established royalty does not exist, a court may determine a reasonable royalty based on hypothetical negotiations between willing licensor and licensee. Wang Labs, Inc. v. Toshiba Corp., 993 F. 2d. 858,870 (Fed. Cir. 1993)

[297] Florida Prepaid Postsecondary Educ. Expense Bd. v. College Savings Bank, 527 U.S. 627 (1999) (dismissing a suit for damages against Florida for patent infringement). Under the complex and non-reciprocal jurisprudence of the 11th amendment, which protects states from citizen suits, a state or its agency is immune from suits for damages when it infringes a patent held by an individual or a federal agency, but can sue the federal government for patent infringement damages if a state agency is a patent owner. In another perverse turn, state officials under some circumstances may be subject to injunctions (as opposed to damage suits) to stop infringing activity, while federal actors cannot be enjoined to desist from infringement. These complexities are cited as further illustration of the patchwork created by the patent system's hybridization of property rights and public rights.

agencies, may pose a threat to national security.[298] This act, although it is an anti-sharing regime, is important because it emphasizes the franchise side of rules of intangible property. Defense and security agencies provide the patent office with designations of technologies that must be specially regulated as defense secrets.[299] The patent office, in turn, refers applications that may connect to such technologies to an appropriate defense agency, which may direct that an order be imposed on the inventor-applicant to make the invention non-transferable, to bar filing in foreign jurisdictions, and to impose classification procedures to prevent the inventor from disclosing the existence of the invention (or material information with respect to it) to anyone. Violators face criminal penalties. [300] Because secrecy orders occur before the issuance of the patent, a question may arise as to whether an order constitutes a taking of personal property, particularly where there has been no government use of the invention. Inventors get a break here; applicants are entitled to periodic reviews for the lifting of such secrecy orders. They may seek compensation for damages arising from lost opportunity resulting from a secrecy order or from government use of the affected invention during the effective term.[301]

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[298] 35 U.S.C. 181-185. The salient terms provide:

> Whenever the publication or disclosure of an invention by the publication of an application or by the granting of a patent, in which the Government does not have a property interest, might, in the opinion of the Commissioner of Patents, be detrimental to the national security, he shall make the application for patent in which such invention is disclosed available for inspection to the Atomic Energy Commission, the Secretary of Defense, and the chief officer of any other department or agency of the Government designated by the President as a defense agency of the United States. (35 U.S.C. 181).

[299] These agencies include the Army, Navy, Air Force, National Security Agency (NSA), Department of Energy, and NASA.

[300] 35 U.S.C. 186.

[301] In the instance of lost opportunity the inventor might want compensation for her inability to license the invention and the inability to file foreign patent applications covering the subject matter of the patent.

An invention under a secrecy order is a strange beast—it is neither a patent nor a trade secret once an application has been filed. Even if its categorization is eccentric, the law recognizes possessory interests for inventions held under secrecy orders. In whatever ways such orders may be categorized, the code has created an initial administrative process and judicial appeals to resolve compensation.[302] Secrecy orders are a pertinent demonstration of how the recognition of private property rights is contingent and constructed (or withdrawn) by public action.

C. Abused Monopolies: Statutory and Constitutional Responses

The abuse of a knowledge monopoly can arise notwithstanding the unchallenged validity of the patent—for example by unfair trade practices such as demanding purchase of unpatented articles as a condition of licensing a patent or by accretions of market power that suppress the competition that antitrust law is charged to preserve. Antitrust statutes may combine with the equity powers of courts as complementary legal tools to check excessive monopoly.[303] The remedy in these instances is some variety of compelled sharing of the patent that was the instrument of the abuse.

As observed earlier, a unilateral right to refuse to license a patent has been in the United States a core element of the patent privilege. Accordingly, the withholding of licenses by a holder is not, standing alone, evidence of abuse or excessive market power. Patent misuse must be linked to a larger illegal anticompetitive action in an affected industry.[304] Judicial

[302] 35 U.S.C. 183.

[303] For a survey with briefcase notes on Justice Department and Federal Trade Commission interventions against mergers and acquisitions that threaten excessive monopoly see Chapter III: Compulsory Licensing as Remedy to Anticompetitive Practice in HealthCare and Intellectual Property, by the Consumer Project on Technology, accessed October 29, 2018, http://www.cptech.org/ip/health/cl/us-at.html.

[304] Windsurfing Int'l, Inc. v. AMF, Inc., 782 F.2d 995, 1001 (Fed. Cir. 1986).

remedies against patent abuse may manifest passively or actively—by a) a court's refusal to enforce a patentee's infringement claims or b) a court's forcing the abandoning of an offending licensing practice or by ordering royalty-free licenses to those who were harmed. Private citizens and corporations have access to the courts for antitrust challenges, as do state agencies, the Department of Justice, and the Federal Trade Commission.[305] Federal law provides a cause of action to "any person injured in his business or property by reason of anything forbidden in the antitrust laws." [306]

Hartford-Empire Co. v. United States is the textbook case marking the lines between permissible use and abuse.[307] The Supreme Court confirmed that the patent holder has "no obligation to use the patent or to grant its use to others," but it established criteria for dedication of the patent to the public through compelled licensing as a penalty for certain types of misuse. In *Hartford* six manufacturers of glass containers were found to have cartelized the industry by cross-licensing patents on methods of manufacturing and imposing production quotas on each other. A trial court imposed a confiscatory remedy of compulsory royalty-free licenses to the pertinent patents to competitors who were injured. The Supreme Court decision was controversial because of the extent of its intervention and amplification of the trial court result; it modified the lower court remedy to require non-voluntary licensing to anyone (but not royalty free) under agency supervision. When aggressive monopolization of patents aims to seize market power beyond the domain of the

[305] Hawaii v. Standard Oil Co. of Cal, 405 U.S. 251, 262 (1972). Antitrust laws encourage "private attorneys general" not just public agencies to act.

[306] 15 U.S.C. §12-27 ("Clayton Act").

[307] 323 U.S. 386 (1945).

patent itself, and when elimination of that monopoly is needed to reestablish competition, then a dedication of the patent to the public is within the compass of antitrust remedies.[308]

Acts of misuse, other than the collusive price-fixing seen in *Hartford*, include transactions to prohibit the manufacture of competing products unrelated to the subject matter of the patent, conditioning a license on the acceptance of products of the licensor, or basing royalty payments on total sales where patented products are only a small part of sales volume.[309] A direct strategic nonuse without extraneous leveraging, however, remains well-protected and not a trigger for remedies that would dedicate a patent to the injured competitors or the public. The patent code provides that courts *can* still support protection against infringements even where the holder had leveraged demands for purchases of separate product, "*unless,* in view of all circumstances, the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned."[310] Today, the legality of tying arrangements for non-patented goods that are essential to the operation of the patented product or process appears to be secured from challenge, while tying to articles that are ordinary commercial staples and *not* associated with patent operation remains vulnerable to intervening legal remedies.[311]

Courts have sometimes treated such situations under a distinct, non-statutory theory, and have refused to enforce a patent because the court's power of equity should not be applied to undermine the fundamental constitutional purpose of the patent—to diffuse, not ration, the

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[308] "Patent Dedication as Antitrust Remedy" (a case note), *Yale Law Journal* 63 no.5 (1954): 717.

[309] See e.g., *B.B. Chemical Co. v. Ellis*, 314 U.S. 495 (1942) (refusing to enforce patentee's infringement claims when observing a use of the patent to restrain competition and protect sales of the patentee's unpatented products).

[310] 35 U.S.C. 271(d)(5).

[311] Dawson Chemical Co. v. Rohm and Haas Co., 448 U.S. 176 (1980).

technical arts. An illustrative case on a patent misuse remedy derived from constitutional reasoning rather than antitrust laws is *Morton Salt v. Suppiger Co.,* [312] twice reversed on its path to the final Supreme Court ruling. Suppiger was the patenting proprietor of a machine for dispensing salt into canned goods; it alleged infringement against Morton Salt, the seller-manufacturer of a competing product. Morton argued in defense that Suppiger exerted an excessive monopoly by leasing its machines on the strict condition that lessees use Suppiger's standard salt products along with the leased machinery. The Court, vexed by differing lower court results, looked to the fundamental purpose of the constitutional patent clause for the encouragement of invention, and observed that Suppiger had used the patent as an instrument to enhance its market for unpatentable products (i.e., salt tablets). The final decision ordered that Suppiger's valid patent on the machine would become unenforceable, as a matter of equity—not only in the case at bar, but in any other future instance unless the owner abandoned its sharp practice.[313] The Court was not simply adjusting the transaction between two litigants, but it was also putting the intellectual property, in this case, the patent, outside the bounds of legal recognition by the judicial system. In this fashion *Morton Salt* illustrates a reserved and not often used "nuclear option" that can erase, perhaps irrevocably, a patent's exclusivity and all the other incidents of property that attach to it. *Morton Salt* stands for the principle that a restrictive practice may fall short of standards for market-power based antitrust violation, but nonetheless be misuse, subject to equity's power to curtail the

[312] Morton Salt Co. v. G.S. Suppiger Co., 314 U.S. 488 (1942).

[313] The court ruled, "Where a patent has been used as a means of restraining competition with patentee's sale of an unpatented product, equity may rightly withhold its assistance from such a use of the patent by declining to entertain a patent infringement action and should do so at least until it is made to appear that the improper practice has been abandoned and that the consequences of the misuse of the patent have been dissipated. " 314 U.S. at 493.

patentee's property right.[314] In rare cases equitable remedies may extend beyond the litigating parties. For example, in the context of a government complaint on intercorporate collusive conduct, courts have ordered that royalty-free licenses be granted to the public at large.[315] Finally, where two competing enterprises attempt to merge under conditions that require review and approval by the Department of Justice or Federal Trade Commission, regulators may anticipate excessive market power unless certain patents held by the emerging parties are freely licensed. In that instance, merger approvals can be conditioned on agreements to license, post-merger, to anyone as a condition of going forward.[316]

D. Limiting Remedies: Efficient Infringement and Licensing

If courts raise the bar for obtaining prohibitory injunctions, then they blunt the exclusionary bite of the patent. Injunctions are the high horsepower vehicle for a holder to freeze its competition before or during an infringement. If an injunction becomes *unavailable*, the holder's protective intervention to preserve its exclusive position turns into an ex post complaint for infringement damages after they have been incurred. The holder must still establish infringement, but must also prove the cost of past and ongoing financial harms. Accordingly, one of the countercurrents against patent exclusivity is to limit the preventative or ex ante injunction remedy for infringement. A change in the available remedies changes in turn the strategic calculations of the patent holder. Where injunctions

[314] See. *Zenith Radio Corp. v. Hazeltine Research, Inc.,* 401 U.S. 321 (1971).

[315] For example, following a government complaint of collusive misuse in the flat glass industry by Libby Owens Ford and Pittsburgh plate for price-fixing, market division, and a variety of intercorporate initiatives, the lower court directed the dedication of 16 process patents to the public and nonexclusive royalty-free licenses *with technical assistance* for 159 patents. United States v. Libby Owens Ford Glass Co., et al. final decrees reported at CCH 1948-49 Trade Cases ¶ 62,323. (U.S. District Court ND Ohio, 1948).

[316] See, e.g., *United States v. Glaxo Group Ltd.*, 410 U.S. 52, 64 (1973) ("Mandatory selling on specified terms and compulsory patent licensing at reasonable charges are recognized antitrust remedies.")

incentivize the fight to maintain monopoly, when remedial action takes the sole form of money damages, incentives for licensing sharing come to the fore. Recent developments illustrate this mechanism.

For decades United States courts applied injunctive powers as a matter of administrative regularity, presuming the appropriateness of this remedy for infringement with little or no cognizance of the inhibitory effects on the research community or consumers. Succinctly, United States law was that the "heart of [a patentee's] legal monopoly is the right to invoke the State's power to prevent others from utilizing his discovery without his consent."[317] As summarized by the United States Court of Appeals for the Federal Circuit in 2005 (in *MercExchange, L.L.C. v. eBay)* lower courts should apply a "general rule that courts will issue permanent injunctions against patent infringement absent exceptional circumstances."[318] Such injunctions could subsequently be coupled with consideration of damages, if any had been incurred. The justification for the rule was as wide ranging as the remedy was strong. The circuit court's holding addressed the protection of *potential* future asset values of intangible commercial property even if the petition for an injunction originated from a holder who might not desire to practice the art. The circuit court's opinion and its holding was arguably the high watermark of the ethic of privatization because it explicitly advanced the protection of speculative commercial leverage for nonusers rather than the constitutional objective of "progress in science and the useful arts":

[317] Zenith Radio Corp. v. Hazeltine Research, Inc., 395 U.S. 100, 135 (1969).

[318] MercExchange, L.L.C. v. eBay Inc. and Half.Com, Inc., 401 F.3rd 1323, 1339 (Fed. Cir 2005). This authoritative formulation came from the United States Court of Appeals for the Federal Circuit, which had been granted specialized jurisdiction over all lower Federal courts in all circuits for appeals relating to patent validity and infringements. 28 U.S.C. 1295(a)(1).

> Injunctions are not reserved for patentees who intend to practice their patents, as opposed to those who choose to license. The statutory right to exclude is equally available to both groups, and the right to an adequate remedy to enforce that right should be equally available to both as well. If the injunction gives the patentee *additional leverage* in licensing, that is a *natural consequence of the right to exclude* and *not an inappropriate reward to a party that does not intend to compete* in the marketplace with potential infringers. (Emphasis added) [319]

By this rule patent owners who merely licensed a patent were entitled to permanent injunctions against infringement. Admittedly a venture's investors can take risks along with creators, and it should be granted that as venturers they might make visionary contributions along with their capital. But the ruling of the circuit court here bolstered strategic patent brokering, too, by giving active technology sponsors and passive, non-practicing entities equal equity under the law. A presumptive, virtually automatic right to a prohibitory injunction, without consideration of all affected interests in society, was a zealous instruction to lower courts usually charged to act under the broad canons of equity to shortcut and narrow their inquiries into the impact of their rulings. The appellate court posture in *MercExchange, L.L.C. v. eBay*, was sharply at odds with a dormant, 135-year-old precedent of the Supreme Court in *Seymour v Osborne*, 11 Wall 516, 533 (1871):

> Letters patent are not to be regarded as monopolies, created by the executive authority at the expense and to the prejudice of all the community except the persons therein named as patentees, but as public franchises granted to the inventors of new and useful improvements *for the purpose of... reducing the same to practice for the public benefit*, as contemplated by the Constitution and sanctioned by the laws of Congress. (Emphasis added). [320]

[319] Ibid. 1339.

[320] The 1871 jurisprudence of Seymour is further revived as noted earlier in Oil States Energy Services, LLC v. Greene's Energy Group LLC (2018) See , Intro., A.

The Supreme Court subsequently intervened in this matter and, in a unanimous decision, rejected the circuit court's directions to presume the equity of permanent prohibitory injunctions when litigating infringements.[321] In a revitalization of traditional jurisprudence, the Supreme Court knocked down the notion that there is special jurisprudence of injunctions "unique to patent disputes." [322] The Supreme Court directed lower courts to reinstate "well established principles of equity" for permanent injunctions, as might arise in petitions for all varieties of wrongs. "Nothing in the patent act indicates that Congress intended… a departure" from ordinary equity practice; the statutory "right to exclude others from making, using, offering for sale, or selling the invention"[323]would neither favor nor exclude permanent injunctions.[324]

The creation of any right must be examined distinctly from the remedies for violations of the right.[325] Since traditional canons of equity limit injunctions to areas where monetary relief does not do justice, traditional tests now burden a patentee-petitioner to show why a money judgment or imposition of license fees on an unauthorized user are not adequate legal remedies. The petitioner cannot collect a permanent prohibitory injunction at the courthouse door before establishing the insufficiency of money damages. The decision

[321] eBay Inc. v. MercExchange L.L.C., 547 U.S. 388 (2006). Justice Thomas wrote for the Court.

[322] Ibid. at 394.

[323] 35 U.S.C. 154 (a)(1).

[324] eBay Inc. v. MercExchange L.L.C, 392.

[325] Ibid. The ordinary principles of equity require a petitioner for a permanent injunction to show substantial harm under a four factor test: 1) an injury that is irreparable; 2) remedies available at law such as monetary damages are inadequate to compensate the injury; 3) the balance of hardships between petitioner and respondent that a permanent injunction imposes favor the court taking action; 4) the injunction does not disserve the public interest. The petitioner need not demonstrate harm under all four factors, but must persuade the court that when all the factors are considered there is a balance of equities in favor of the petition.

encouraged lower courts to use more discretion to consider whether a patent is being conscientiously used when ruling on permanent injunctions. Good faith efforts to work the patent and the public benefit from the invention can now factor more heavily into decisions about defending a patent or seeking cooperative alternatives.

The potency of the Supreme Court's ruling in *eBay Inc. v. MercExchange L.L.C* in the context of the whole patent system is that it gives favor to the idea of *efficient infringement*. The result is a close cousin to non-voluntary or compelled licensing, although its origination is different. Accordingly, an unauthorized user may find it *optimally efficient* to infringe when a license is sought and denied, with the expectation that legal damages, once injunctions are off the table, will compensate the patentee justly and put the infringer in roughly the same economic position as a voluntary licensee. A concurring opinion observed that the recent social and economic setting of the patent system had changed. It cautioned, "An industry had developed" for the harvesting of the license fees by holders who were non-practicing entities, for whom legal damages could appropriately compensate. Such entities do not merit the leverage of an injunction when they "do not use patents as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees."[326]

The outcomes in the *eBay* cases were triggered by the abuse of unearned leverage by non-practicing entities, but their effects may reach further.[327] The cases advise that

[326]Ibid. 397-398 (J. Kennedy et al. concurring).

[327] The concept of efficient infringement may encourage competition and the commercialization of new products and methods, but it can create losers, as well. Small businesses in industries dominated by large ones can use the power of an injunction for bargaining leverage in negotiations with their industry's big players. The MercExchange outcome does not necessarily require that a court reject their petition for injunction, but it increases litigation-transaction costs and the risks that a small player will be negotiating without the best weapons. Considerations of the size and power of parties to a dispute can be a consideration of equity to keep the field level.

substantial limitations on the exclusive rights of patenting do not have to originate from statutes that compel sharing or public dedication. Judicial remedies that require a) the court to examine the circumstances under which a patent is exercised and b) emphasize monetary relief will stimulate patent sharing by the recognition of efficient infringements. In an atmosphere where injunctions are rarely granted, parties will also be more likely to privately order their affairs before going to the courthouse. Shared intangible property can be generated under the influence of remedy limitations. Those seeking relief from an infringement can bear the burden of vindicating their claims of harm post hoc—after their inventions have been used non-exclusively in the community.

Chapter IV: An Inclusive Patent Model: Polycentric and Cooperative

> The impasse in which we find ourselves today in respect to the rational financing of inventions, offers a vivid example of a whole range of more momentous embarrassments. We see here an objective which we feel that society should be able to achieve and for the attainment of which no institution can be devised. It is an instance of the social task that for the time being we must consider as unmanageable.
>
> Michael Polanyi[328]

A. No Archimedean Point for Managing Knowledge

Polanyi, a distinguished chemist and philosopher who understood how patents could suppress collaborative innovation was understandably vexed, but his despair over the management of inventions was excessive. The variety of coexisting patent regimes with sharing rules should break the belief that a dominant system of exclusionary patent rights is unshakably fixed. Technology has been driving a productive institutional diversity. To satisfy the demands of public contracts and to manage innovation in energy, environmental, plant genetic, and other resources, the patent code affixed itself to polycentric cells across separate agencies. Each cell serves a public stakehold that private market relations do not fully address.

Multifarious sharing obligations emerged from the regularities of the patent code's exclusionary core and then evolved. While the patent code set the terms of an inventor's basis of claims, the modes of enforcement have fallen to different agencies with distinct remedies for the claimants whose discoveries are used by others. The modern patent system originated in the frustration that the unregulated market failed to guarantee an inventor a recovery of investments and the belief that the cure was regulated monopolies. It has changed into a multi-organizational mix of specially tailored remedies that includes some

[328] Michael Polanyi, *The Logic of Liberty*, (Indianapolis: Liberty Fund, 1998), 207.

traditional monopolized rights, some compelled licensing by government agencies, and some open licensing for parties that are allowed to petition for user rights.

Underlying this polycentric system are competing moral dispensations and temperaments. The holder of the belief that the liberty to accumulate and transfer property is foundational in a democracy may value guarantees of exclusive property interests created by a patent as good *per se*. Such foundational commitments can be impervious to arguments for any systematic reforms that derogate strong property rights. This view anathemizes non-voluntary licensing or compelled sharing. If, on the other hand, patent rights are seen as franchises extended on behalf of the republic, then the special demands of each technical art will move the rules of intangible property toward cooperative sharing. The frustration over the drug industry's apparently intractable failure to focus research on the principal disease burdens in favor of high cost strategies, the possibility that lags in the development of 5G communications may demand crash programs with managed collaboration, and worry over employing standardized devices for a sustainable re-gridding of electricity could, under cooperative norms, move government to extend anti-exclusionary regulations for collaboration in discrete areas—even if they do not create an upswell for reconstructing the patent system in its entirety.

The undertaking now is to advance specific design principles, substantially adapted from existing public law, that will best resist non-cooperation and reward collaborative investigation— in the spirit of Franklin with his stove and Jefferson with his moldboard plow. The principles may be applied to specific technologies and new subregimes, or to a broadly reconceived patent code applicable to all inventions. An imperative of cooperation can encourage spontaneously ordered private co-venturing and settlement of dispute-prone

matters outside the thickets of litigation, as well collaboration under agency grants and contracts for innovation.

B. Ex Ante Property Rules, Ex Post Liability Rules, and Sharing Contracts

Principles for a redesigned system must realign the available remedies for violations of rights in regard to intangible ideas. The remedies the state provides for breaches represent the operational limits of abstract rights. A well-theorized framework distinguishes two remedial platforms to protect property holdings from trespassing or external harm—property rules and liability rules.[329] Schematically, property rules defend private holdings until the holder transfers its interest *willingly* at a price to its satisfaction. The transfer might be total or partial, such as access by easement. If someone wants to take the entitlement over property from its holder, it must be by a voluntary transaction agreed to by the holder-seller, who can veto the transfer. The state is involved in protecting the entitlement of the owner, but not involved in determining its value.[330] Blackstone's imperious trope proclaims that property is "that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of

[329] Guido Calabresi and A. Douglas Malamed, "Property Rules, Liability Rules and Inalienability: One View of the Cathedral," *Harvard Law Review* 85, no.6 (1972): 1089-1128. The analysis in this article was inspired by Ronald Coase's theoretical work on liability allocation. See Ronald H. Coase, "The Problem of Social Cost," *Journal of Law and Economics*, 3 (Oct., 1960): 1-44. Coase theorized the possibilities of efficient private bargaining to compensate the harms of externalities if transaction costs related to negotiations, surveillance of performance, and legal dispute resolutions were non-existent—which of course they are not. In the domain of patents, however, it is the very allocation of property rights that constitutes both the external harm and legal insulation of a party from having to engage in bargaining. Monopolists do not have to bargain. The problem presented in this dissertation, accordingly, arises from conditions that are dissimilar to the abstract model that inspired Coasean theory. We are not dealing with a bi-partite, party to party model where transaction costs have been eliminated, but rather with rules that impose uncertainty and inappropriability conditions on the use of knowledge resources for *all actors*, now and future, known and unknown. However, like Coase, Calabresi and Malamed, we are interested in displacing property rules with principles of liability and compensation.

[330] Ibid, 1092.

any other individual in the universe."[331] In this sense a property right is right that is assertable against the entire world.[332] Out of this tradition, the state shall stand prepared to enjoin (i.e., issue a personal order) against any taker or lesser trespasser. Such injunctions signify that the person and his holding are coupled: trespass is an assault on *both* of them. By contrast, a liability rule requires the offended property holder to accept compensation for losses associated with appropriation of affected property. A person may intervene and participate in the entitlement to use the holder's property if she is willing to pay in accordance with value-determining rules. The holder does not have rights against the world, but only against particular people whose actions intervene upon his holdings. Persons can exercise rights of use, while holders have rights of compensation against such persons. Since surrender of use is non-voluntary, the parties submit to procedures to settle the value of the holder's diminished entitlement. The entitlement is protected but may be subject to non-voluntary transfer (in whole or part) with compensation.[333] Under a liability rule the injured holder bears the burden of proving the amount of harm resulting from the taking or the loss of value. Losses are reckoned after the fact.

Under property rules, injunctions can be issued during the progress of or in anticipation of harm. In the framework of patents, it is the prospect of a prohibitory injunction that hangs over the heads of competitors to an inventor. That prospect affects actors before a certainty that harm will occur. It restrains action before the creative efforts of all possible agents can play out to the benefit of society. Liability rules, however, resolve disputes after a knowledgeable and testable reckoning of what has actually occurred. And, in the case of

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[331] Commentaries, Book II, Ch. 1.

[332] Such rights against the world are often referred to as *rights in rem.*

[333] Calabresi and Malamed, 1093.

patents, because such a reckoning would be ex post, public agencies and parties can place themselves in a position to examine the interests that were harmed by an infringement, such as loss of an inventor's chance to develop streams of revenue and the inventor's nonuse or weak commitment to work the discovery. Liability rules respond to what is known to have occurred and aim to reckon all the consequences; property rules in the name of fundamental rights are action-limiting and often oblivious to the useful consequences they suppress. To be sure, an injunction may be strategically advantageous to society. For many types of harms— environmental damage comes to mind—it may protect the public. The suitability of injunctions for the management of knowledge, however, implicates entirely different types of consequences that can be justly addressed by compensation alone.

Circumscribing the remedy by means of a liability rule transforms the holder's rights and the user's duties. The configuration of available remedies structures the legal powers of ownership; this can be expressed in the relational terms developed by Hohfeld. A liability rule eliminates both the "privilege" of nonuse and the correlated "no-right" (to use) imposed on the potential user. At the same time the "power" to demand compensation remains with the holder and a correlated "liability" to pay remains with the user. [334] To reprise the Blackstone trope, liability rules disable the totalizing "despotic" claims that the holder "exercises over the external things of the world."

The tensions between the application of property rules and liability rules in the domain of patents has been previewed in the earlier discussion of the 2006 decision in *eBay Inc. v. MercExchange, L.L.C.*, (see III.A.9), where the Supreme Court ruled that lower courts

[334] Wesley Newcomb Hohfeld, "Some Fundamental Legal Conceptions as Applied in Judicial Reasoning," *Yale Law Journal* 23, no. 1 (November 1913).

should not *presume* a patent holder's entitlement to an injunction, even on an initial showing of merit for its claim of infringement. Lower courts, after *eBay*, must probe whether the social costs associated with the prohibitory injunctive protection should be denied and whether, instead, an ex post assessment of compensation would be most just. *EBay* did not strip the courts of the judicial power to issue prohibitory injunctions; the code still provides that power.[335] The power of injunctions for patents remains with the federal courts alone, acting under principles of equity. *EBay* advises those courts, however, that the final *just* remedy in an infringement matter may be the virtual equivalent of negotiating fair royalties on terms approximating the ones parties could have arrived at without litigation in a private commercial setting. The post-infringement remedy that the court would pursue when injunctive relief is off the table is not different in substance from a pre-infringement remedy that occurs when a party is subject to the non-voluntary licensing subregimes that have been analyzed earlier. Some parties may want to be heard within the awesome majesty of the United States federal court. Seeking relief in the context of expensive federal litigation can be a means of putting pressure on an opponent. *EBay's* encouragement to put patent disputes in the frame of licensing and compensation weakens the advantages of adjudication, on the one hand, and makes court remedies parallel to the dispute mechanisms of the subregimes and private ordering, on the other.

The Supreme Court has also reinterpreted the meaning of private property rights associated with the patent in the narrow context of post-grant challenges to patent validity. Recall how the 2018 *Oil States Energy Services, LLC* decision, discussed earlier in detail (Intro., A.2), treated the issue of whether canceling a patent was an illegal deprivation of "common-law property" that enables the holder's access to life-tenured judges in the

[335] 35 U.S.C. 283.

federal courts created under Article III of the Constitution or whether an administrative board of the Patent Office could properly conduct post-grant, on-the-record proceedings. The holding of the Court per Justice Thomas was that, at least during a window for administrative post-grant review, patents should be "public franchises" that may be withdrawn by administrative action and may be differentiated from other forms of property recognized at common law, like land or crops.[336] In dissent Justice Gorsuch objected that the Court's public franchise categorization deprived the holder of previously recognized property rights. Curiously neither the opinion of the Court or the dissent identified the existing subregime exceptions for assigning non-voluntary licenses— the established processes that are consistent with the public franchise conception of a patent grant.[337] (See Intro. A.). Ignoring these current laws, the two opining justices, who are among those that observe originalist interpretive conventions, generalized from competing 18th-century views of "the patent." Each claimed that his position was more like one that the founders and their contemporaries could have embraced. Be that as it may, the implications of *Oil States* go beyond de-authorizing Article III courts for the hearing of certain post-grant challenges. The majority's ruling is a conceptual rebuke to the notion that patents must always include strong property rights. And in conjunction with *eBay, Oil States* invites lower courts to thicken the burden on patent holders who petition for property-based remedies, like injunctions. The "franchise" characterization under *Oil States* gives lower courts another basis to reason that the public interest can be adequately served by ex post liability rules (in this case, imposition of license fees). The two recent high court cases are

[336] Oil States Energy Services, LLC v. Greene's Energy Group LLC, 584 U.S. ___ (2018) (No. 16-712) (April 24, 2018).

[337] A concurrence by Justice Breyer identified generally that many instances of administrative regulation impact property rights, without focus on patent administration in particular.

elbowing, if not displacing, property rules for rectifying infringement or reconsidering validity determinations. They are threads that can over time be pulled to unravel the cloak of exclusionary property rules as lower courts treat new cases.

C. Maximize Private Ordering (Fullerian Views)

In any system for administering justice, the procedures for hearing a controversy may themselves be a source of injustice, despite being conducted by a disinterested, neutral officer. Practitioners on both sides of the bench know that, even when a remedy exists within judicial structures, it may not be exercised because the expense of seeking justice can exceed a party's ability to pursue it. Delays associated with litigation waste more than money; they absorb administrative time and divert personnel from their jobs. Infringement and validity disputes, in particular, can generate unjust results and reward noncooperation. Moreover, patent litigation is commonly weaponized when one party feels better prepared to withstand litigation.[338] Since parties will structure their business and professional relations according to the means that can settle their disputes, there is good reason to neutralize these weapons. The dispute process itself should not be a stimulus of contention. A responsible institutional design should be a good fit between the rights to be examined and the procedures to examine them.

Two particular examples of bad fit commonly afflict the patent world. First, adversarial adjudication of infringement can present a density of disputed technical facts beyond the comprehension of judges or juries. Fact-finding competence in the context of adversarial proceedings is restricted; often, only the competing parties understand the dispute and only they can detect obfuscatory argument. Competing expert opinions are capable of creating

[338] See the discussion of Apple-Palm dispute, II.

more fog than light. If well-financed parties compromise and settle in the midst of litigation, it will likely be the result of a lack of confidence for fashioning a clearly better story for the challenged fact finder. There is no crucible of truth in adversary proceedings if judge and jury cannot confidently sort the salient facts. Possession of large resources to advance expensive litigation will beat down some adversaries before their lawyers get to the courthouse steps. If the adjudication process is expensive because of outside legal fees and in-house absorption of precious research and administrative time, then the winner will be the party best able to tolerate the burden of litigation. This, too, is a denial of justice. And there are further unhappy results. The winner preserves a strategic advantage, but the cost of his vindication for society is a more secure monopoly. The loser, who is often an inadvertent infringer, will see its capital and resources forfeited to some degree. The strategically advantaged parties will promote disputes over patents that are incidental to a technical art's chief benefit, and a legal system will reward their noncooperation.

A second example of bad fit is patent litigation's resistance to finality. The composition of the patent customarily entails not one, but a series of claims. Questions of infringement can hang on the meaning of a single claim or a combination. When such infringement disputes are adjudicated, they settle the issue of one infringing use by a particular user against whom an action is brought.[339] In an infringement dispute, patents themselves are not invalidated in the adjudications, but a particular use is determined to be unacceptably infringing or acceptably outside the scope of the patent claim.[340] The result that affects a use by Party A will be irrelevant to the disputes that may arise from a use by Party B.

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[339] Unlike infringement disputes, challenges to patent *validity* have broad applicability and bind present and potential future parties.

[340] There are post-grant legal actions to defeat the validity of the patent. The context of the points made here pertains actions claiming infringements.

Despite complex records of decisions and appeals, subsequent disputes can arise under the same patent; the earlier dispute has no precedent effects; and technical interpretations are not necessarily simplified or transferable to new facts. Contrast this to a contract dispute between two parties over a missed delivery or a failed product; these disputes treat a fixed body of fact and, subject to appeal, can have a legal finality. The multiplicity of disputable claims and potentially offending uses in patent cases presents vexing obstacles to achieving final adjudications over matters arising from similar circumstances.

Legal philosopher Lon Fuller investigated how the methods used to adjudicate *or* resolve disputes shape the social relations among parties *before,* as well after a judgment has settled the matter.[341] Fuller advised that the modes of legal ordering should be multi-organizational. Legal processes are double-facing: they provide a variety of mechanisms under which the parties are heard, but they also express different moral and practical principles of obligation appropriate to the conditions giving rise to a dispute.[342] Legislative rulemaking for example, brings moral expectations of process transparency and standards of general applicability to all. The processes to determine criminal culpability bring expectations that the heaviest weight of evidence—facts beyond reasonable doubt—is necessary to deprive a person of liberty. Simple contract disputes and claims of tortious negligence determine compensation based on expectations of reciprocity, promise keeping, or a duty not to disturb others. Such disputes are not settled with reliance on the strictest standards of evidence, nor is compensation expected to be precise. Fact finders must only determine who has the better case.

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341 "The Forms and Limits of Adjudication," *Harvard Law Review* 92 (1978): 353-409.

342 On this taxonomy see Kenneth I. Winston, "Introduction," *The Principles of Social Order–Selected Essays of Lon L. Fuller* (Durham N.C.: Duke University Press, 1981): 26-29.

Going further, Fuller identified the several circumstances under which court adjudications were a well-functioning habitat for dispute resolution, and he contrasted these to the places where other forms of legal ordering might be sought. To summarize the most salient factors, common-law disputes (e.g., most contracts and negligence claims) fit an adjudicative process because they present a two-sided question, the facts are closed and the incident is over, the moving party seeks well-defined relief, and the decision affects the interests of the very persons who are before the court.[343] One may add an additional "Fuller-factor": that the subject matter is usually one that parties, judges and juries are competent to understand. Clarity in the issues joined in disputes that fit these factors will give an adjudicated outcome public legitimacy. But adjudication falters as a method of social ordering where the simplifying factors above are lacking, and the disputes arise from what Fuller associates with polycentric interests and tasks. Polycentricity in the Fullerian scheme affects dispersed allocations of decision-making and widespread, perhaps, uncertain consequences. Examples of polycentric problems would be determinations of the boundaries of a legislative district, or (notably for this discussion) the allocating of scarce resources for scientific research, or the design of a network of new thoroughfares through a city. These are issues of long-term management of resources or tasks (now and future) that affect persons and interests who are both present and yet to appear.[344] These may be matters where the future costs to society can be difficult to reckon, where the parties affected by decisions may only be identifiable in the future, and where the problem requires ongoing flexible managerial skills within guidelines set by a public authority. Simple

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[343] Fuller, "Forms and Limits," 357-362.

[344] Lon L. Fuller, "Adjudication and the Rule of Law," *Proceedings of the American Society of International Law* 54 (April 1960):4.

common-law adversarial determinations of facts do not prioritize public ends; the equitable powers of injunction are tailored to the actions of immediate parties and do not treat the effects of orders on parties outside the dispute.[345] Patent disputes confront what Fuller calls "the limits of adjudication."

Once we embrace a collaborative norm, what interests need to be served by a redesigned system for resolving disputes? The sharing of knowledge requires a policy that rebukes monopoly and exclusion. If sharing becomes the rational expectation of research, parties should 1) be protected from forfeiture by uncompensated imitation of their work; and 2) be put in a situation that rewards cooperative settlements where the parties themselves best understand the strengths and weaknesses of each other's interests. The dispute system should be open to the best case: that is, the parties can side step disputes and explore the prospects of ongoing collaborative enterprise based on new discoveries.

For polycentric problems, where neither strong managerial control nor private ordering separately fit the problem to be solved, Fuller's work advances a hybridized legal ordering or "mixed forms of social ordering involving adjudication and contract" in which there are "obligations to negotiate under threat of exercise of adjudicative powers" with possible penalties.[346] He draws upon the experience of the World War II War Labor Board, with its obligations to negotiate or face a penalty. That body met the need for an uninterruptable war economy with decentralized management of the highly pluralized, contentious demands of different industries and sources of labor. This essay has already explored a

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[345] One of the cardinal conditions of an injunction is that its effects shall not be adverse to the public interest. Hence, Justice Gorsuch needed to argue in philosophical terms in *Oil States* that the defense of private property rights in patents entails a public interest perceived in the broadest context of the constitutional property. See *Oil* Slip Opinion, Dissent of Gorsuch at 10-11.

[346] Fuller, " Forms and Limits," 405-408.

number of later analogues to the War Board, where the pluralized private interests of inventors confront the demands of centrally regulating agencies that control the entry of new devices and processes. The obligation to negotiate matters of patent sharing is designed into law under several acts: The Atomic Energy Act, the Clean Air Act, the Plant Varieties Act, the Federal Insecticide, Fungicide, and Rodenticide Act, and Bayh-Dole Sponsored Research. (See III.A.2-8). In each of these instances the public law refuses to acknowledge unalloyed private rights, nonuse, or a holder's voluntary control of licensing. It imposes rules of collaboration among technologists and also compensates inventors. In each case the law maintains safety valves to impose a resolution when parties fail to settle their terms. With the foregoing considerations for limiting property rights in favor of liability principles and for overcoming the limits of formal adjudication, rules for a non-exclusionary (or inclusive) patent system become possible. Here is what they can look like.

D. Patents Without Injunctions: Trespass Now (Settle Up Later)

A linchpin of the alternative rules proposed here is that patent disputes are resolved by monetary settlements without injunctions.[347] The patent code authorizes the issuance of injunctions (temporary, preliminary, or permanent) to support infringement claims. This redesign would annul that element of judicial power.[348] This change pushes the domain of patents from defense of property rights toward efficient infringement and implied contracts

[347] To this it might be objected that there will be no remedy against an insolvent infringer. A reply would be that the holder could obtain an order of attachment of affected inventories of an unlicensed user in priority over other creditors. The problem of potential insolvency affects all commercial trade; patent holders are no more prejudiced than others. The proposal here does not provide special creditor rights to a patent holder.

[348] 35 U.S.C. 283 now provides "The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the violation of any rights secured by patent, on such terms as the court deems reasonable."

for sharing inventions. Injunctions are the guardians of monopoly; both the prize and the guards are dismissed as a relic of the Blackstonian norm. Patentees become proprietors of the privilege of being a licensor rather than the monopolist. But the inclusive rules will recognize the problem of "demoralization costs," [349] where uncompensated losers withdraw from productive activity. A just patent system should consider how every party could suffer these costs and mitigate them. Productive inventors should not indemnify imitators and forfeit investments, just as the research community should not be handcuffed by patent monopolies. Licensing may provide cost recovery for patent-holding inventors and their sponsors, but such licensing must be open to all seekers and charged at reasonable, administratively determined fees. Once actual costs of invention development are recovered, the patented discovery would enter the public domain. Moving from the judicial sphere, the basic rules for administrative agencies in a non-exclusionary patent system now follow.

E. Proof of Concept for Inclusive Rules of Administration

A norm is not fully expressed until the demands it places on actors are specified. If cooperative principles are to become a predominant norm of this domain, its sponsors must specify the functional rules. Because agencies intermittently practice inclusive rules, a set of consistent design principles for inclusive patenting should be derivable. Practical operational directions to move the hands and feet of patent-granting officials, inventors, users, and dispute resolvers should track the process cradle (application) to maturity

[349] For a discussion of incomplete compensation and demoralization costs resulting from takings see Frank I. Michelman, " Property, Utility, and Fairness; Comments on the Ethical Foundations of 'Just Compensation Law,'" *Harvard Law Review* 80, no.6 (1967): 1165. Michelman's observations of the difficulties in appraising these costs and the insufficiencies of utility costs in such appraisals are pertinent to the uncompensated "loser" posture that inventors may face.

(compensated sharing). A just and cooperative allocation of new knowledge resources could be fashioned around a sequence of six interlocking operations. Readers are advised to examine these principles as a top-level, "proof of concept" for the feasibility of a reintegration of the system. Here is the list of operations that will be taken up in further detail.

1) **Open Applications**: for alleviation of uncertainties that affect research allocation choices.

2) **Soft Examination**: for introducing expertise for evaluating patent applications and improving patent quality.

3) **License of Right and Redefinition of Infringement**: for counteracting monopoly, making knowledge appropriable for the entire research community, and accelerating invention improvements.

4) **Cost-reimbursement with Limitations on Recovery**: for protecting substantial inventor interests, but without rent seeking and deadweight losses of monopoly.

5) **Private Ordering and Specialized Dispute Resolution**: for encouraging cooperative venturing, reducing the costs of disputes, and de-weaponizing litigation threat tactics.

6) **Patentability Exclusions and Direct Rewards**: for encouraging flexible multi-centric policy that match patent policies to particular technical arts and social needs.

Each proposed rule, when compared with current rules, withholds some strategic advantages from holders or users. As a unity, however, they comprise a re-alignment of priorities whose merit should be tested, first on whether they encourage privately ordered, cooperative arrangements and second, on whether the diffusion of knowledge for the research community moves closer to optimum. These rules reflect a moral and temperamental disposition toward cooperation. The undertaking behind these proposals is to confront the critical areas of rulemaking that can push non-cooperative dispositions out of the system.

1. Open Applications—Knowledge Sharing at the Outset

a. Immediate Invention Disclosure to Create Inchoate Claims

Current law provides for closed applications and examinations. The procedure for winning a patent (known also as "patent prosecution") is ex parte. That means that members of the research community, the public at large, and the applicant's competitors have no role in the examination and approval for the acquisition of the patent. Currently, the patent office assigns a primary examiner who guides the application through a process of acceptance, reiteration of submittals, or rejection. Rejected applications may be abandoned or appealed to a board of patent appeals. Open application, as an alternative, would end the ex parte process and allow the community of inventors, researchers, and competitors to examine new claims, make informed challenges against an applicant's claim to have discovered new art, or even propose co-venturing, through private contact, while an application is pending.

A pending, open application will not leave the applicant with no protection from imitators. An open applicant will be at the front of the line with an *inchoate* claim for royalties that can be *perfected* when its invention is used. The open application, accessible in public electronic files, will constitute notice to possible imitators of this inchoate claim, and trigger their obligation to notify the applicant of an intent to make, use, or sell the applicant's device or process, while acknowledging that it will be obligated as a licensee of the patent (treated further in IV.E.3). Recall Rothbard's principal complaint against the patent system: that it was without a contractual basis such as the one for copyrights.[350] (II,

[350] Our intent, with license of right, is to force a licensing transaction and deny the inventor-registrant the privilege of nonuse or discrimination in selection of her licensees, subject to royalties. Because an inventor is

D.4) The open application or registration process proposed here satisfies Rothbard's concerns by putting the intellectual property right on an implied contractual basis. Hence, the application process becomes a close cousin to copyright registration, where registration creates an implied contractual obligation to the author. The Constitution provides that Congress may create patents that grant inventors some form of an *exclusive* right for their discoveries.[351] The exclusive right bestowed under this redesign is the holder's sole capacity to be the patent's licensor and receive its royalties. Exclusive power to prohibit invention use is, however, no longer available.

As with current requirements, open applicants must submit references of pertinent prior art to the office for evaluation of novelty and non-obviousness. This system design, however, imposes an important discipline on the submittal, imposing penalties on applicants if future challenges expose materially significant prior art that the applicant failed to disclose at the outset. Because submittals that lack thorough disclosures of prior art put avoidable costs on others, if a non-disclosure is later found to be willful or negligent, then a successful challenger to the patent can be allowed to assess its costs against the careless applicant. These requirements demand heightened prudence from the applicant when claiming any state-based privileges, and they may discourage the filing of the patent. More accurate claims of patentability at the outset aim to make the process less dispute prone and, where contests arise, to pinpoint disqualification more efficiently.

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free to rely on trade secrecy, which is a creature of private contract, and is free further not to engage the public patent process, some versions of the libertarian outlook might embrace license-of-right rules.

[351] U.S. Constitution, Art.§ 8, ¶8.

b. Cost Disclosures at Time of Application

Applicants will disclose to the patent office an auditable itemization of the costs of invention research. This section of the application, however, will remain closed and confidential until third-party users enter into a fee determination process. To what purpose? The disclosures will be used in licensing fee computations (a process described later, at IV.E.4). Submission from complex enterprises shall differentiate "direct" costs from an allocation of general overhead and administrative costs according to generally accepted accounting principles, so cost disclosures for a specific patent are not loaded extraneously with costs supporting other objectives. Submittals of this kind rely on tools and methods that are well assimilated in current business operations. Accounting standards for differentiating the direct costs of production from the business-wide expenses for facilities and administration are already observed in federal contracts and grants,[352] and they are commonplace "back office" procedures in research and manufacturing institutions for intercompany transactions and relational contracts where deliverables are flexibly priced on a cost-reimbursement plus fee basis. Small businesses and proprietorships that function without multiple business segments will have simpler presentations of their outlays.

At the time of this initial cost submittal, applicants may have predictable, but not yet incurred development costs. Accordingly a trailing submittal, possibly three years after the initial one, could be appropriate for capturing valid cost commitments to be considered in the process of royalty determination and licensing.

[352] See Federal Acquisition Regulations 48 CFR 31.205.18 (Independent Research and Development Costs); also Federal Cost Accounting Standards CAS 420 treat this topic for contracts held by the contractors with significant contractual interactions with the federal government. Such contracts are mature and adaptable models for these purposes.

c. Effects on Inclusiveness and Cooperation

The open application notifies the pertinent sectors of industry of potential progress in the technical arts. Uncertainties regarding the direction of research investments can be reduced for the entire research community; inventors and technology officers can weigh whether the observed progress of others should direct their efforts toward one technical art or another. They may choose to aggressively compete on a parallel, but differently conceived technical art. Or they may choose to focus on perfecting a secondary invention, dependent on the one that has been disclosed, and open up possibilities of co-venturing with the applicant. Meanwhile, the applicant (whose priority has been established by its filing) can pursue the development of supply chains for commercialization with its perfectible right to control licensing revenues *if* the merit of the patent is secured in the examination process. Vendors and potential subcontractors can come to the applicant. That process of interaction may apprise the applicant of practical defects in its invention as well as the reasonableness of its estimates of marketability or manufacturability. The interaction may lead to fruitful amendments to the application or a timely cost-saving abandonment of an impractical opportunity, if commercial infeasibility becomes apparent.

2. Soft Examinations, Best Evidence, and Burden Shifting

a. Enlistment of Community to Assess the State of the Art

Going hand-in-glove with the practice of open applications would be a procedure of "soft examination" at the patent office, whose objective is to reduce the sway of office examiners and inject additional expertise into the approval process that is now excluded by closed review rules. In the resulting process, a preliminary or soft examination could occur at the patent office, to be followed by acceptance of evidence for and against the patent

claim from experts in other public agencies, academia, or competitive business. These external sources would be able to see pending applications under the open system. As discussed earlier, patent office determinations of novelty and non-obviousness are ex parte, meaning that they may not engage expert opinions from competitive enterprises or the research community. The patent code implements the notorious acronym "PHOSITA," a standard that conditions patentability on the reviewing official's conclusion that the invention would *not* be obvious to a "person having ordinary skill in the art." [353] Peculiarly, the best resources to assess a standard of "ordinary skill," often may not exist within the patent office. Competitive enterprises and the research community maintain the best awareness of the state of the art. Soft examination can yield to the expertise and assessment of the state of the art from outside the bureaucracy. There is no public interest in issuing weak patents or shunning the best evidence of patentability. The patent office should also be able to initiate engagements of expert consultants, acting as fact-finding masters, at the expense of the applicant, if iterative queries of the applicant leave matters of current practice in the relevant art in doubt. Soft examination increases the burden on patent applicants to accurately disclose relevant prior inventions.

b. Limiting Presumptions of Validity After a Grant

Under the current code an approval from the patent office is a rebuttable, prima facie finding that a novel and nonobvious invention is protectable. Currently, the courts give patent office actions a presumption of validity—meaning that validity challengers (or accused infringers) bear the burden of persuasion that a patent's approval was unwarranted.[354] Where the law establishes a legal presumption, it must be rebutted by clear

[353] 35 U.S.C. 103(a).
[354] 35 U.S.C. 282.

and convincing evidence[355]— hence, on a showing merely that there was significant evidence to deny an approval, a challenge may still fail. Notwithstanding the greater scrutiny of claims that would occur under open applications and soft examination procedures, presumptions of validity and the high burden on challengers would not continue to apply automatically in the system being proposed. The argument here is that a lower standard of proof for a challenger, and the removal of the presumption may drive parties to collaborative agreement. Under a lower standard, a patent holder has more of a chance to lose a privilege, and a prospective user has more of a chance to leverage a good license.

In the redesign, consideration may also be given to maintaining a higher burden for challenges to validity or imposing other limits on challenges where evidence could have been brought forward in the pre-grant review, but was not. Such rules should counteract the possibility that a challenger might casually "lie in the weeds" or strategically challenge a patent after a patentee has made substantial investments toward commercialization. The window for post-grant challenges by a non-patentee should be a short one under the open system to encourage the prompt treatment of challenges.

c. Effects on Inclusiveness and Cooperation

Soft examination will help bring transparency and efficiency in two primary ways. It presses applicants to make their disclosures complete and subjects them to the caution that their claims to have made a discovery can be firmly tested by the community. The patent office gains a tool for imposing a rigorous survivability test on the applications. Combined with open applications, early joining of issues between and among potential disputants will

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[355] Clear and convincing evidence "places in the ultimate fact finder an abiding conviction…that the factual contentions are 'highly probable'." Colorado v. New Mexico, 467 U.S. 310,316 (1884).

make for better decisions on allocations of research resources and will discourage strategic uses of litigation by penalizing delays in challenges.

3. Redefinitions of Infringement and the Use of Licenses of Right

a. Infringement is Failure to Engage Licensing Process

Current law defines an infringer as one who "without authority makes, uses, offers to sell, or sells any patented invention."[356] Under an inclusive, cooperative rule set, however, the authority to undertake these acts is obtainable on demand, subject to conditions that a patent user must fulfill. This creates a "license of right." To activate the license, first, a user must take diligent steps to determine whether a device or process is within an existing patent or is disclosed in an open application under review. If so, next, she has a further duty to notify the holder to request a proposal for licensing terms and negotiations. This notification to the holder authorizes a constructive license of right to use, make and sell the patented article, subject to the determination and settlement of royalties.[357] An act of infringement occurs *after* a non-holder has either failed to provide notice or failed to pursue settlement of license terms. Infringements under current law may also be "indirect," where a party has, without notice to the holder, induced infringement by selling an apparatus that has infringing uses, by furnishing repair or replacements of infringing goods, or by selling components specifically suited to the protected article. Acts that today constitute indirect

[356] 35 U.S.C 271.

[357] "License of Right" is a settled option for inventors under the Patent Act of the United Kingdom. In exchange for relief from application and maintenance fees from the patent office, the inventor promises to license its invention on demand for fees to be negotiated or determined by a royalty panel. Some inventors opt to be responsive to demands in this way as a means to hold out their resumes and inexpensively attract investors who see the patent as an offer to engage expertise. UK Patent Act § 46 (1977).

infringement will also, under the new rules, be authorized under the same conditions as a direct demand for a license of right.

The prospective user's notification will not waive rights to make pre- or post-grant challenges to patent validity and can be a trigger (and a forceful nudge) toward private ordering of cooperative arrangements. Where issues of patentability are ambiguous, the parties will have the knowledge to face that fact, to evaluate the fee demand, to explore a basis for joint work or to initiate dispute resolution on patent validity and fee amount. To optimize compliance with the duties associated with licenses of right, users who ignore them should face special penalties when they fail to provide notice to a holder. Under existing law a court may increase damages up to threefold under circumstances supporting willful infringement.[358] Under new rules a user's failure to notify the holder that the patented idea is being engaged can trigger enhanced penalties in a form of some multiple of the otherwise payable royalty. Burdening users with the duty to maintain transparency and support licensing transactions is an offset to the inventor's loss of exclusivity and its capacity to restrict uses.[359] When non-holders notify a patentee of an intent to exploit a discovery, the holder, in turn, must act promptly, too, by presenting a fee demand and cost disclosures so that negotiations can begin or the matter can be referred to an appropriate body for dispute resolution.

[358] 35 U.S.C. 284.

[359] In the case of the special category of "design" patents, a disgorgement of the user/offender's profits may be computed and assessed, instead of the estimated lost profits of the patent holder. 35 U.S.C. 289. The availability of the disgorgement remedy for ordinary ("utility') patents is a possible change under the alternative design that would further increase the risk of users neglecting the licensing rights of holders. Consideration of all the possible sanctions does not need more detailed specification here.

b. Experimental Uses Not Barred

A cooperative patent system will restore the 19th and early 20th centuries' tolerance for experimental uses of products and processes, without threat of infringement.[360] Current law prohibits experimental use if it has the "slightest commercial implication." [361] An inclusive system, however, would revive not just the right to tinker, but also to do work in anticipation of finished articles before tests or production for commercialization. While experimentation would not trigger liability for fees to the patentee, notification of use would be required and an amended re-notification at any point where the non-holder takes steps toward commercial venturing, including, for example, seeking capital. Because nonprofit research activity would no longer be deemed infringing, institutions would be more likely to undertake noncompetitive and collaborative work with other nonprofits. Collaboration between nonprofits and private firms could occur, with notice to patentees and reservation of patentee rights for future fee determinations.

c. Work Allowed on Development of Downstream Improvements

Corollary to the rules that would tolerate experimental uses, an inclusive regime will stimulate developmental work with patented articles or processes for improvements to the patent, as long as the improvements are not promoted, marketed, or sold outside a development facility until the license-of-right protocol has been observed. Downstream improvements to inventions can thereafter be perfected and sold subject to licensing obligations. Mid 20th century patent codes in a number of nations extended the right of the

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[360] I.C.6., supra.

[361] See Embrex, Inc. v. Service Engineering Corp., 216 F.3d 1343, 1349 (Fed. Cir 2000). "Even if the experimental use excuse retains some lingering vitality, the slightest commercial implication will render the 'philosophical inquiry/experimental use' doctrine inapplicable, as occurs in the court's resolution today."

inventor of a dependent device to demand a negotiable license from the holder of a pioneering patent. The redefinition of an infringement within the alternative design would restore that practice.

Policymakers will undoubtedly consider whether licensing demands related to downstream improvement of inventions can be made at any time or whether a holder should have a period (e.g., three to five years) to freeze such demands. In other words, should the initiating holder have a period for improving her own invention, developing techniques of training and production, and setting up a supply chain without having to negotiate third-party demands for a license-of-right. Because the purpose of open applications and soft examinations is to create opportunities for co-venturing and supply chain organization, the initiating patentee should arguably have some "quiet" time for perfecting its own plan. An alternative design need not necessarily strike every advantage for being a first mover; it must, however, prevent any extended period of exclusivity or nonuse. On the other hand, acceleration of an inventive activity is an important motivation for the redesign. Debate on this issue would surely occur.

Refinements of the new rules will also have to consider the rights of pioneering patents in relation to improvements. For example, when should pioneers be granted royalty-free licenses for any improvements made by others, and when should fee determination rules be reciprocally imposed on them?

d. Policy Precedents for Non-Restricted Licensing for Dependent Patents

Required licensing in connection with dependent patents is not revolutionary. The Paris Convention specifically gave states "the right to take legislative measures" that allow petitions for compulsory licenses for commercial "abuse" in the form of "failure to work" a

patent.[362] Where United States law recognized patentee abuse only in assertively predatory tactics, international law considered a holder's neglect of a patent to be a misapplication of the patent system. The Convention further expressly permitted states to allow petitions by private parties for compelled licensing of patented inventions not used or worked by their owners for periods in excess of four years. Consistent with the Convention, laws in several foreign jurisdictions went further and compelled sharing and cross-licensing with another patentee when an applicant could demonstrate that her own patent would be unworkable and wasted absent a coordinating license—after a request for a license had been refused. This policy derogated private rights and privileged complementary and sequential interactions among patentees. As one historian of the patent system noted at mid century:

> Before the recent war the Bahamas, Barbados, Bermuda, Bulgaria, Czechoslovakia, Grenada, Greece, Iceland, Leeward Islands, Norway, Northern Rhodesia, Southern Rhodesia, St. Lucia, St. Vincent, Seychelles, Swaziland, Switzerland, and Trinidad provided for compulsory licensing under a patent when the license was necessary to enable the owner of another patent to make the best use of his invention. In Bulgaria, Czechoslovakia, Greece, Iceland, and Norway, however, such licenses were made available only if the blocked invention was of considerable public importance, and in Switzerland, if it was a distinct technical improvement. Bulgaria, Greece, and Iceland required the recipient of such a license to grant reciprocal rights to use his own patent.[363]

These provisions created virtual private licenses of right. Such mechanisms for petitions to require patent sharing no longer have the backing of international patent law, which was modified by the 1994 Trade Related Agreement on Intellectual Property (TRIPs). The newer terms continue to recognize that compulsory licenses related to enabling an invention or improvement may sometimes be an authorized instrument of a state's public

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[362] At Section 5A, the Convention provides:

> Each country of the Union shall have the right to take legislative measures providing for the grant of compulsory licenses to prevent the abuses which might result from the exercise of the exclusive rights conferred by the patent, for example, failure to work.

[363] Corwin D. Edwards, *Maintaining Competition: Requisites of Government Policy* (New York: McGraw Hill, 1949), 241.

law, but the grounds for implementation are now markedly narrower and highly conditioned. TRIPS now provides that uses without the authorization of the patent owner cannot be privately petitioned but must be for use by a government or third parties authorized by a government.[364] TRIPS also now requires government action to be subject to scrutiny under a standard far tighter than the ones under the Paris Convention discussed above. Under TRIPS:

> Members may provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions *do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice* the legitimate interests of the patent owner, taking account of the legitimate interests of third parties. [365] (Emphasis supplied)

If a government-sponsored petition can overcome the barrier of "not unreasonably conflicting with normal exploitation" the enabled patent must be a technical advance of "considerable economic significance,"[366] a requirement for which no clear standard of application yet exists. Finally, under TRIPS the original right holder must be guaranteed prior notice and a reasonable process for contesting the petition, with the opportunity to prevent or enjoin nonexclusive use prior to exploitation.[367] Within its own borders, United States law has never acknowledged any special independent privilege for private parties

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[364] Formally, the World Trade Organization's Agreement on Trade Related Aspects of Intellectual Property Rights (Appendix No. 4 to the Uruguay Round, General Agreement on Tariffs and Trade (GATT) (1994), or "TRIPS." See Article 30.

[365] TRIPS Article 30 (Exceptions to Rights conferred); it can be fairly argued that the language quoted above coupled with the creation of an international dispute mechanism that can displace national authority and makes the TRIPS treaty an instrument of national deregulation. The language above provides transnational corporations a jurisdictional hook for obtaining relief from a national policy that advances any non-voluntary licensing regime.

[366] TRIPS Article 31(l).

[367] TRIPS Article 41 on enforcement and remedies:

> Members shall ensure that enforcement procedures as specified in this part are available under their law so as to permit *effective action against any active infringement* of intellectual property rights covered by this agreement *including expeditious remedies to prevent* an infringement and remedies which constitute a deterrent to further infringements. (Emphasis supplied)

with regard to licenses that are needed to enable new or improved inventions. While the international frame under TRIPS does not preclude enabling licenses with government sponsorship from benefiting from compelled licensing, it gives private firms that hold prior exclusive licenses an array of strong tools to obstruct it. The following point however must not be lost: the framework of existing international law, even after TRIPS, allows a policy space for *government* action to require patents to be treated as shared property for the purpose of enabling a new invention.

e. Effects on Inclusiveness and Cooperation

License of right and the redefinition of infringement are not designed to drive all discoveries into a comprehensive commons of knowledge. In an alternative system, inventors and enterprises may still rely on trade secrecy to retain first-mover advantages in a technical art. Exploration, however, will not be penalized. Nor will exploring researchers be ambushed in a race to invent, where the loser's opportunity to use its own research is at the mercy of the winner. The redefinition of infringement also addresses the concerns expressed by those cited earlier who believed that innovation was impaired by a pioneer's excessive leverage against improvements. (See II.B.3, supra).

4. Cost-Reimbursement Limitations on Recoveries

a. First, Allow Recovery of Actual Costs

Classically, the property-based conception of patents assumes that exclusivity for a fixed term of years should underwrite the recovery of investments. In monopoly conditions, however, investment recovery from direct sales or licensing can far exceed invested costs. The detachment of revenue from research costs is a counter-incentive to investment that can stifle innovation. Why innovate if you can continue to accumulate without capital

expenditures? The redesigned system maintains instead that society should not indemnify a monopoly once the costs of research and development are recovered. Monopoly positions that are maintainable without patents are not our concern. The position asserted here, however, is that the public can have a compelling interest in investment recovery only up to the point of reimbursement of essential research and development costs for the discovery, not beyond.

Rules of cooperation should distinguish the rent-revenues (as accumulated in the current system) from the cost reimbursement limitation (in the design alternative). The current system encourages the patent to be a rent-producing, profit-bearing asset.[368] An alternative system is hostile to state sponsorship of patent rents. If two independent parties privately pursue joint development of a discovery, a patent holder may negotiate a long-term profit-bearing deal that generates returns beyond investments, based on particular contributions or trade-offs between parties. The alternative system does not reject such privately developed possibilities. Moreover, the alternative design is friendly to the multiple possibilities for profit-bearing ventures from cross-licenses, patent pools, and trade secret exchanges. This tolerance goes away, however, when a party needs to exercise its publically protected license of right and must assert it against a patent holder. The returns to be available for the patentee will then be cost-reimbursement of essential, prior-disclosed research and development costs as presented in the patent application and subsequent updates (see IV.E.1, supra on cost disclosures to the patent office). In this way, the alternative system may allow inventors substantial replenishment of allocated funds for research. Further

[368] The rent-seeking, asset value of patents was set out proudly by *MercExchange, L.L.C. v. eBay Inc. and Half.Com, Inc*., 401 F.3rd 1323,1339 (Fed. Cir. 2005).

detail on the organization of a cost-reimbursement methodology for patent compensation is set out in the appendix to this chapter in four examples.

b. Reimbursement Includes Imputed Profit in the Form of Cost of Money

Does the cost-reimbursement template leave room for profit for the inventor? When a royalty or license fee is privately negotiated and the parties consider historically comparable transactions, they come to agree on profitable returns. The alternative system will not prohibit a negotiating holder and prospective user from freely coming to their own fee determination. In the absence of successful negotiation, where dispute resolution must be called upon, the alternative system will curb rent seeking and the accumulation of profits that would encourage the maintenance of existing technology and discourage improvements. Accordingly, the alternative system will impose a profit limitation and recognize only an *imputed profit* as an element of its cost. This means that a patentee should claim constructive profit based on "cost of money,"[369] or a benchmark to put the inventor in the position of a hypothetical off-the-street investor seeking interest or dividends. Recoverable profit will be limited to the interest or dividends that an amount equal to the research and development expenditures would have generated in capital markets during the period of invention and subsequent processing of the patent application.

c. Effects on Inclusiveness and Cooperation

Holding recovery to cost-reimbursement drives continuing enterprises to rely on improved competiveness to sustain revenues. Patentees can no longer rely on exclusionary rules to fend off competition and postpone investments. Cost reimbursement may be a

[369] "Cost of money" refers, by definition, to the interest that could be earned if the amount invested in a business or security was invested in a bond or time deposit.

reduced diet, but patent holders will not starve. They will avoid investment forfeiture for a meritorious patent, while the public avoids the deadweight losses of monopoly. Some enterprises will protest that limitations on revenues shrink resources for new research. The claim has plausibility, but cost-reimbursement limitations are a trade off. The limitations are materially, if not totally, responsive to reimbursing inventor resources, while they invigorate the commons, technology sharing, and co-venturing.

5. Private Ordering and Dispute Resolution

One of the challenges of achieving efficient dispute resolution is to create conditions where both parties understand that they are talking about the same problem and the same options. A licensing-of-right system lowers the stakes of infringement disputes. With monopoly off the table, parties who are familiar with the dynamics of their own industries can do business with an understanding, at least within a rough order of magnitude, of the potential revenues and expenses associated with a licensing demand. Understanding the range of probable impacts, in dollars to be gained and lost, will better advise them how to allocate not only research budgets, but also the valuable personnel and administrative time that may be lost in taking on a dispute.

The transparencies achieved by open applications and soft examinations will prevent impenetrable technical issues from afflicting judges and juries. Advocates in adversarial proceedings will no longer pursue the cottage industry of convincing puzzled fact finders that two deeply different sets of events have occurred. To the contrary, where both parties at the outset can decently approximate the outcome of the problem, the prospects for negotiated private settlements, possibly with some skillful mediation, are strong. Locating

the fundamental terms of dispute in a cost-reimbursement result takes most disputes out of the mouths of lawyers and into the spreadsheets of accountants, under settled standards.

Under the public franchise rationale of *Oil States* and consistent with the flexible dispute methodologies of the existing patent subregimes, patent rights do not necessarily require the protection of the constitutional courts.[370] For challenges to patent validity and decisions of the patent office to grant a patent, government-sponsored administrative panels can be empowered. This practice is what *Oil States* has recently approved. Panelists can be selected for their expertise in the relevant art; inquisitorial rather than adversarial hearing rules can cheapen and expedite the dispute process. Panels can assess per diem costs to finance dispute resolution and remind parties to expedite the proceedings. Ventilating the issues in this forum may lead to productive side discussions and settlements.

Infringement matters may be handled somewhat differently. Accordingly, under a public franchise rationale, infringement (as newly defined) and royalty determinations could by statute be consigned to binding arbitration or a specially constituted regulatory panel. The jurisdiction of the U.S. District Court to hear infringement claims[371] could be cut back to

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[370] FIFRA, The Clean Air Act, the Atomic Energy Act, and the Plant Varieties Act devise special administrative pathways to non-voluntary sharing. FIFRA specifies dispute resolution through the commercial arbitration offices of the American Arbitration Association for trade secrets, a practice upheld by the Supreme Court in Thomas v. Union Carbide Agricultural Products, 473 U.S. 568, 585.

> Article III [creating courts with life-tenured judges] does not prohibit Congress from selecting binding arbitration with only limited judicial review as the mechanism for resolving disputes among participants in FIFRA's pesticide registration scheme… Several aspects of FIFRA establish that the arbitration scheme adopted by Congress does not contravene Article III. The right created by FIFRA as to use of a registrant's data to support a "follow-on" registration is not a purely "private" right, but bears many of the characteristics of a "public" right. Congress has the power, under Article I, to authorize an agency administering a complex regulatory scheme to allocate costs and benefits among voluntary participants in the program without providing an Article III adjudication. (570)

The court reasoned that rights to the consideration of a life-tenured judge are not implicated, because parties consent to participate in a complex regulatory scheme. Analogously, no inventor or enterprise is required to obtain a patent, apply for any privileges under the patent code, or abandon reliance on trade secrecy.

[371] 28 U.S.C. 1400.

oversight of binding arbitration with strictly limited judicial review under the Federal Arbitration Act.[372] To those who believe that the highest level of the federal judiciary must touch such disputes, it can be observed that under the Federal Arbitration Act life-tenured judges of the federal system may still review an order in arbitration. However, under that act they may disturb a result only after finding that "corruption, fraud, or undue means" secured the arbitrator's decision. This limited judicial review rarely disrupts the finality of an arbitrated result. A tripartite process of empanelment is typical for arbitrations, with each side selecting one panelist, who then together select a third from a list of neutrals provided by the administering body.[373]

To summarize, the cooperative system will comprise four venues for adjustment of licensing rights between patent holders and users. First, when agencies invoke compulsory licenses, claims that are unresolved between contracting officers and patentees will be resolved in the U.S. Court of Federal Claims. Second, when patents are governed under a complex regulatory subregime that includes non-voluntary licensing, licensing issues will be resolved, as they are today, according to the various kinds of procedures the Congress determines are appropriate for the matters regulated. Third, administrative boards within the patent office will hear patent validity challenges. Finally, in the commercial world, private ordering with resort to binding arbitration, when needed, will resolve infringement and licensing controversies, subject to the enforcement process of the Federal Arbitration Act.

[372] 9 U.S.C. §§ 1-16.

[373] An alternative procedure may allow parties to strike arbitrator candidates from a list, with the arbitration administrator selecting a panel from the remaining candidates.

6. Moving Some Walls: Use Rewards As Well As Patents

An alternative system can recognize that the technical arts are multifarious: for example, the conditions for innovation and discovery for pharmaceuticals are not what they are for mechanical devices. Functionally, patents aim to regulate markets so that people (namely, inventors) do originate discoveries that otherwise might never occur in an unregulated or free market because of their doubts over the recovery of their investments. But this is largely a "just so" story; it ignores the case that competition drives discovery, patents block it, and the patent system alone cannot target societal needs. State-directed enterprises, not patents, may be the preferred regime for ordering inventive activity in some areas. If, for example, the financially robust pharmaceutical industry fails to pursue research in new antibiotics to deal with the primary disease burdens affecting world health, then centralized intervention to sponsor public research might be the best answer. A polycentric institutional design for management of knowledge should leave room for state-directed action, and not every technical art should necessarily be open for patenting.

Direct contracts from agencies, awarded competitively, may also be most suitable. Perhaps federal financing of clinical trials will motivate research by supporting the most expensive and risky part of drug development. Again, perhaps a direct compensatory reward for success best mobilizes research resources and talent.[374] Finally, but not least, patent redesign includes state discretion to remove technical arts from the constraining forces of the patent code.[375]

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[374] See Michael Polanyi "Patent Reform," *The Review of Economic Studies* 11, no. 2 (1944): 61-76.

[375] The WTO, Trade Related Agreements on Intellectual Property (TRIPS) now provides under Article 27 that under the domestic laws of its member states, "Patents shall be available for *any inventions* whether products or processes in all fields of technology, provided they are new, involve an inventive step and are capable of industrial application." International pharmaceutical corporations argue this term of the treaty article obligates all members to honor patents for drugs and medical devices. Other sections of the TRIPS

Chapter IV Appendix on Licensing Reimbursement

Let's contrast licensing terms under existing remedies with the ones that would be available under the alternative design. When courts are required to determine a reasonable royalty, they may be able to conveniently rely on an actual history of the patentee's licensing of the invention or similar items. Otherwise, the court must construct a fictional simile of royalty negotiations by looking at the evidence presented by the litigants. A widely adopted judicial methodology, dubbed the *Georgia Pacific factors,*[376] provides a list of elements to review when actual or historical royalty fees are not in evidence. The court in this simulation will ask that parties bring forward facts that they might put on the table if they were in private negotiation. These may include: rates paid by the infringer to license comparable patents, the benefits of selling the patented material for promoting other sales, the availability of non-infringing substitutes, the infringer's expected profits, and evidence from licensing practice in the industry. From this data, the court approximates the fair royalty and imposes its judgment.

The prevailing *Georgia-Pacific* guidelines accommodate a forecast of the rent- bearing potential of a patentee; continuing profit (rent) is an expectation of such simulated negotiation. Accordingly, those guidelines are available to defend a monopoly position. The cooperative system proposed in Chapter IV, by contrast, identifies a public interest in rewarding investment, but not with passive rent. Conditioned on evidence that a patent holder is making good faith attempts to drive the patent to productive use, the alternative design would allow consideration of an inventor's (or enterprise's) incurred research and development costs, disclosed at the time of the application and updated later, as the presumptive baseline for cost recovery. Complete dormancy (non-use) would as a matter of policy make costs unrecoverable.

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agreement are cited by opponents of the industry to create exceptions to the "any inventions" terms. A library of articles and trade press reports treats this controversy.

[376] Georgia Pacific Corp. v. United States Plywood Corp, 318 F. Supp. 1116 (1970).

Reasonable royalties require a fact finder to set amounts that are consistent with the sound management of an ongoing business. Hypotheticals can illustrate the contrast between the rent seeking and cost reimbursement norms:

Ex. No. 1 Inventor A perfects a thermal management device for cooling electronics and extending battery life. The device is in successful production. A is a mass-quantity vendor, and has recovered all research and development costs before the expiry of the patent. Enterprise B, believing it can efficiently produce the device, seeks a license of right. Upon an accounting it is evident that A has recovered its development costs. B has a royalty-free license by operation of law.

Ex. No. 2. Inventor C perfects a thermal management device for cooling electronics and extending battery life. The device is successfully used in mass personal consumer electronics. Relying on C's discovery, Inventor D creates a patentable adaptation to miniaturize C's device for aerospace and zero gravity applications and demands negotiations for a license of right. Inventor C has no interest or capacity to pursue those applications. C's cost of research and development shall constitute a cap on the amount of the fees that D, and other downstream licensees should they come forward, may be required to pay. To arrive at a reasonable fee, D's obligation will be liquidated on a per unit basis based on his estimated sales, using the ratio of D's estimated sales to C's volume to reckon the maximum fractional amount of C's development costs that D would pay in per unit royalties. D will not be prejudiced if licenses are granted to others, since their remittances to C will reduce everyone's contributions toward meeting the cap. All royalties simply terminate when C's cap is reached from all sources. Conceivably, early licensees will carry a greater share of reimbursement contributions to C, but they enjoy advantages of earlier entry in the area of technology.

Ex. No. 3. Inventor E perfects a thermal management device for cooling electronics and extending battery life. Despite some successful prototyping, the device fails after 200 thermal (hot-cold-hot) cycles. E is stymied. Inventor F, with expertise in materials engineering, is certain that he can manufacture a modified device using E's invention, and he demands a license. F will pay royalties, but they will not aggregate to exceed research and development costs incurred by E. E's investment becomes recoverable through the fees obtained from the device as perfected by F, but E cannot exert blocking leverage with its otherwise unusable patent by threatening to force F to keep its modifications on the shelf, refusing to negotiate, or holding out to force fees beyond a reasonable level.

Ex. No. 4. Inventor G does extensive conceptual work for a thermal management device for cooling electronics and extending battery life. G's costs are nominal (a few hundred hours of labor time). G has secured a patent without testing a prototype or analyzing feasibility for manufacture. Enterprise H seeks a license of right. In negotiations, G is entitled only to a nominal fee. G may seek an order that H in all descriptive literature of any finished items must cite G and his patent. In this way G may retain the promotional value for its inventive work.

Accounting accuracy of costs claimed for reimbursement is subject to challenge by the patent office or a licensee and subject to the civil and criminal penalties for false claims and false statements

associated with transactions with federal agencies. As for accumulation and accounting of receipts due inventors, subscriptions to a reliable accounting clearinghouse can fulfill accounting and distributions in the fashion similar to that of congressionally authorized copyright clearinghouses for music royalties for artists and composers. Penalties for nonpayment and cost of collections can be instituted, as well.

Chapter V: Conclusion: Overcoming the Uncertainties of Patenting

> *We should not conceive of an institution as a kind of conduit directing human energies toward some single destination…. Instead, we have to see an institution as an active thing, projecting itself into a field of interacting forces, reshaping those forces in diverse ways and in varying degrees.*
>
> Lon Fuller[377]

A traditional view regards the patent system as a means to promote an outcome: namely, to protect a new invention and the investment that went into it. Treating patents as private property is the means to that end under this traditional view. Unfortunately, the privilege of holding property interests in ideas creates disabilities and disutilities of a magnitude that brings the entire system into question. Suppose, however, we focus not so much on the outcomes of investment choices, but on the process of discovery. Instead of having rules aimed at perfecting private interests, we seek, as the first priority, collaboration among researchers and enterprises as the end point or purpose of the system. The proposed rules from the previous chapter make the means and methods of interaction among inventors and enterprises more important than the strategic claims they make against each other.

A. De-sacralizing Intangible Property

The resource of knowledge is plainly different from an exhaustible physical resource. For example, in the latter case when an increasing number of vessels can openly access a fishery, yield from the fishery may remain the same for a time, but the catch per unit will decline as more boats exploit open access and smaller fishers are squeezed out.[378] In the world of exhaustible physical resources, a clear "end state" objective can be identified:

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[377] Lon L. Fuller, "Means and Ends," in *The Principles of Social Order*, ed. Kenneth I. Winston (Durham NC; Duke University Press, 1981), 54.

[378] This example recalls Elinor Ostrom's discussion of two Turkish fisheries in *Governing the Commons* (New York: Cambridge,1990), 148-149.

preserve the resource. The social practices that can deplete the resource are observable, too. Knowledge resources are of an entirely different sort. There, the end state is ephemeral, inchoate, and conceptual; the creative endowments of inventors *are* the resource. For those who are pursuing discoveries, rather than commodities like fish, open access to relationships among exploring inventors offers the best chance to avoid resource dissipation and waste. In the world of intangibles, the most powerful tools of discovery are relations with other investigators. Researchers with an understanding of the entire field of play in a technical art will not waste time reinventing the work of others or waste resources figuring out non-infringing methods to accomplish something new and useful. Policies can reflect rules that limit or expand the key resource, as we have defined it. Rules can direct whether the inventor acts as a private strategic investor who sees her work as a corpus of capital from which to seek maximum rents. Or rules can direct that the inventor be a principal human resource to be cultivated collectively, be protected from forfeitures caused by uncompensated imitation, and be encouraged to share all the gifts of her explorations.

In the domain of patents today the restrictions a patent holder may enjoy for the protection of investment are simultaneously constraining the improvements and advances of his invention. Today, whatever rewards the current patent code may provide to a holder, there will be some form of resource deprivation—somewhere always a loser. Because the patent system blocks the inexhaustible flood of creativity, one cannot know what social returns society forfeits in exchange for some uncertain benefits from a holder's monopoly. The current system never tells us what we may have lost. This is the "uncertainty principle"

of patenting that we should repudiate—not with mere lamentation, but with new basic rules to neutralize it.

To implement the model will require that new cultural-normative values gain momentum. At the outset, the association of patents with private property must be de-sacralized. Next, the rules must be repurposed: designed for inclusive cooperation in research and co-venturing in enterprise. Inventors must lose the sponsorship of state power to shackle the community by blocking the sharing and development of ideas. Finally, inventors must be honored with public credit for their work and non-monopolizing claim rights for reimbursement of development costs.

Our culture has a divided psyche regarding property in ideas. Its highest legal authorities tilt back and forth on whether to characterize the power of patents as originating in public franchise or private rights of property. Its administrative institutions frequently dilute the exclusionary property rights that are normally assigned and hybridize them into sharing regimes. Nevertheless the sacred institution of private property casts its wide shadow over the courts, Congress, the patent office, and the research community, despite being doubted in legal doctrine and contradicted in agency practice. The patent system meets anthropology at this conjuncture. Mary Douglas, taking inspiration from Durkheim, describes an applicable social mechanism to account for such cultural disharmonies.

> Any institution that is going to keep its shape needs to gain legitimacy by distinctive grounding in nature and in reason: then it affords its members a set of analogies with which to explore the world and with which to justify the naturalness and reasonableness of the instituted rules, and it can keep its identifiable continuing form. Any institution then starts to control the memory of its members; it causes them to forget experiences incompatible with its righteous image, and it brings to their minds events which sustain the view of nature that is complementary to itself. It provides the categories of their thought, sets the terms for self-knowledge, and fixes identities.[379]

[379] Mary Douglas, *How Institutions Think* (Syracuse: Syracuse University Press, 1986), 112.

The analogy on which people depend to make private property the staple of the intangible patent system is a loosely and carelessly invoked notion of natural right that likens the patent to a harvest from personal toil in the fields, even though in *this* domain the assignment of the right is often arbitrary. True inventors may not be rewarded, and patent holders may weaponize their privileges against others. The occlusive effect of this powerful analogy obscures the manner in which discovery is incompatible with private property.

The association of patents and private property is more sacralized today than it was in the 18th Century—whose leading thinkers on the management of inventions abjured the application of natural rights to this institution. In *Liardet* in 1778, Lord Mansfield emphasized that the patent grant was awarded by the court as society's role in a two-sided *transaction* in consideration of the abandonment of trade secret: it was a bounty for the release of valuable knowledge, not a property preserving judgment at law (See I.C.2, supra). Franklin and Jefferson likewise rebuked natural rights justifications that made their labor the basis of entitlement to control ideas exclusively. (See II.B.1 and II.D.3). For them, inventors owed a debt to their collaborators and predecessors with whom there was an implied, if not formal, obligation to share knowledge.

As the bureaucracy of patents has grown, the Mansfieldian notion of transactional equality looks weak against the sacralization of private property rights in intangibles. Nevertheless, some deep tectonic shifts can be detected under the Supreme Court's standards against prohibitory injunctions for infringement and its striking of patented algorithms for business processes. These developments evidence the weakening of the walls of exclusivity. The regulatory subregimes persist, and they also expose the

underlying residual power to selectively make strict exclusionary patent rules impermissible. But is there any area of technical art whose current status could force a wide public reckoning of the incongruities the system? Patents on pharmaceuticals have the broadest prospect for stimulating challenges, because the patent system is not helping to control prices of commonly available medications nor generating research to address the most dangerous disease burdens. It may be the case, however, that only calamity will generate comprehensive deliberation on the doubtful legitimacy and logic of the whole patent system.

B. Making the Means More Important Than the Ends

In the 1958 study on the success of the patent system written for the Senate Committee on the Judiciary, Fritz Machlup concluded that economists generally lacked a responsible assessment of the consequences of the patent system:

> If one does not know whether a system "as a whole" (in contrast to certain features of it) is good or bad, the safest policy conclusion is to muddle through, either with it, if one has long lived with it, or without it, if one has lived without it. If we did not have a patent system, it would be *irresponsible* on the basis of our present knowledge of its economic consequences to recommend instituting one. (Emphasis added) [380]

In distinction to Machlup, the model of inclusive patenting commended in this dissertation is socially *responsible* precisely because it abandons pretenses of certainty over economic success. The model proposed in this dissertation combines individual and collective entitlements. It identifies the rules to topple the obstacles to cooperation created by the patent system. It promises no economic outcomes, but offers the terms under which collaborative research might increase.

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[380] *An Economic Review of the Patent System,* Study of the Committee on the Judiciary, United States Senate, Pursuant to S. Res. 236: Study No. 15 (Washington, D.C.: United States Government Printing Office, 1958), 80.

It is useful to look at the model as an inversion of the traditional relationship of means and ends. The traditional patent system treats exclusionary rights as the end, namely a reward of a title to a monopoly for "the invention." The revised inclusive model may yield results that are fruitful or indeterminate. But let the rules demand collaboration: the results will fall where they may. Let the rules create property titles of a limited sort, but only as the residual mechanism for reimbursement, not as restrictions on activity. The concept of inclusive patenting does not look at the patent code as a way of allocating a particular type of possessory interest, but rather as an arrangement of relations in the community of inventors and researchers. The proposal pays homage to Lon Fuller's case for the authority of means over ends, or at least the parity of means and ends. It responds to his central entreaty for the right architectures of social institutions,

> A social institution makes of human life itself something that it would not otherwise have been. We cannot therefore ask of it simply, is its end good and does it serve that end well? Instead, we have to ask a question at once more vague more complicated—something like this: Does this institution, in the context of other institutions, create a pattern of living that is satisfying and worthy of man's capacities?[381]

We agree with Lon Fuller, in regard to institutions like the patent system, that "it is a mistake to assign an unconditional primacy to ends over means in thinking about creative human effort."[382] Fuller advises us further that "human aims and impulses do not arrange themselves in the neat row of 'desired end states." Instead, they move in circles of interaction." The proposal for inclusive patenting protects principles of collaborative interaction at the outset, and the acquisition of personal rights afterward—but with regard to their ultimate conjunction.

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[381] Fuller, "Means and End," 55.

[382] Ibid. 51.

While we argue that the labor of an inventor is insufficient to justify exclusionary patent rights, a persistent voice demands that the exertions of any risky enterprise require respect. A fair argument can be made that the recognition provided by an approved patent application could by itself justify a patent system. Our proposal for inclusive rules affords respect to inventors with protection a venture risk while demanding that a patented invention be the feedstock for future discovery. Inventors may have their reimbursements, but they will also have the honor to repay society by allowing the world to improve their work. Inclusive rules will, to reprise Fuller, be the means for a "better pattern for living that is satisfying and worthy of their capacities"[383] and will inspire shared ends among inventors and supportive enterprises.

[383] Ibid. 55.

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