When Patents Claim Preexisting Knowledge

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Novelty is a basic requirement of patent law. An inventor cannot obtain a patent if the invention exists in the "prior art," a term that generally refers to knowledge and technology already in the public domain. Interestingly, an earlier-filed patent document qualifies as prior art as of its filing date — even though the document does not become accessible to the public until much later. The rationale is that the first inventor did all that could be done to promptly disclose the invention to the public; administrative delay of public accessibility due to Patent Office procedures should not count against the inventor. That the first inventor placed the patent document in the pipeline toward disclosure justifies backdating it for prior art purposes. But an earlier-filed patent application is not the only type of "pipeline" disclosure. A manuscript submitted for publication in a peer-reviewed technical journal is also on a trajectory toward public disclosure. This Essay argues that patent law should not only treat such manuscripts the same as earlier-filed patent documents for prior art purposes, but that backdating is more justifiable for peer-reviewed publications. This Essay raises interesting theoretical and policy questions about novelty and the meaning of prior art.

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INTRODUCTION

A fundamental principle of patent law is that a patent cannot issue if it would remove knowledge already in the public domain.[1] Patent law requires novelty; the statutory requirement that an invention "be *new*, that is, bestowed for the first time upon the public by the patentee."[2] If the invention is already known, the public would pay the price for a patent but receive no benefit from it.[3]

As a theoretical matter, the novelty rule makes sense. Promoting innovation through disclosure is often viewed as the primary goal of the United States patent system.[4] This works through a quid pro quo between the inventor and the public.[5] The basic idea is that in order to promote the full disclosure of the invention to the public, the inventor must be given something in return.[6] What the inventor gets is the limited period of exclusivity conferred by the patent grant.[7] The public gets detailed knowledge about the invention as soon as the patent document publishes[8] and possession of it at the end of the patent

[1] Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 146 (1989); Graham v. John Deere Co., 383 U.S. 1, 6 (1966).

[2] 1 WILLIAM C. ROBINSON, THE LAW OF PATENTS FOR USEFUL INVENTIONS 305 (Boston, Little, Brown, & Co. 1890); *see also* 35 U.S.C. § 101 (2012) ("Whoever invents or discovers any *new* and useful process, machine, manufacture, or composition of matter . . . may obtain a patent . . . ." (emphasis added)).

[3] *See* GEORGE TICKNOR CURTIS, A TREATISE ON THE LAW OF PATENTS FOR USEFUL INVENTIONS IN THE UNITED STATES OF AMERICA § 292 (Boston, Little, Brown, & Co. 2d ed. 1854); *see also infra* Part I.B.

[4] *See Bonito Boats*, 489 U.S. at 151 ("[T]he ultimate goal of the patent system is to bring new designs and technologies into the public domain through disclosure."); Aronson v. Quick Point Pencil Co., 440 U.S. 257, 262 (1979) (noting that one goal of patent law is "[to] promote[] disclosure of inventions . . . to stimulate further innovation"). This goal emanates from the Intellectual Property Clause of the Constitution: "To promote the Progress of Science and useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their . . . Discoveries . . . ." U.S. CONST. art. I, § 8, cl. 8; *see also* Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U.S. 502, 511 (1917) ("[T]he primary purpose of our patent laws . . . is 'to promote the progress of science and the useful arts . . . .'" (citation omitted)).

[5] *See* Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 480-81 (1974); Special Equip. Co. v. Coe, 324 U.S. 370, 378 (1945).

[6] *Kewanee*, 416 U.S. at 480-81.

[7] *Id.* at 480 ("In return for the right of exclusion — this 'reward for inventions' — the patent laws impose upon the inventor a requirement of disclosure." (citation omitted)).

[8] *See id.* at 481 (explaining that when the information disclosed in a patent becomes publicly available it adds to the "general store of knowledge" and assumedly will stimulate ideas and promote technological development); *cf.* Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 400 (1960) ("Whenever novel

term.[9] But if an invention is already known, the inventor cannot give anything to the public that it did not already possess.[10]

Determining novelty requires a comparison of the invention that the applicant seeks to patent with the "prior art," which refers to preexisting knowledge and technology already available to the public.[11] Documents like issued patents and printed publications are common sources of prior art.[12] A specific document asserted against the invention that the applicant seeks to patent is called a prior art reference.[13]

The America Invents Act of 2011 ("AIA") converted the U.S. patent system from a first-to-invent regime to a first-inventor-to-file regime.[14] To qualify as novelty-defeating prior art under the AIA,[15] the asserted reference must satisfy three conditions. First, it must predate the applicant's filing date.[16] Second, every element of the claimed invention[17] must be identically disclosed or described within the four corners of the reference (the "strict identity" requirement).[18] So, for

subject matter . . . is published, progress in the art is promoted.").

[9] Evans v. Eaton, 20 U.S. (7 Wheat.) 356, 418 (1822).

[10] *See* Pennock v. Dialogue, 27 U.S. (2 Pet.) 1, 23 (1829); Timothy R. Holbrook, *Patent Anticipation and Obviousness as Possession*, 65 EMORY L.J. 987, 994 (2016) [hereinafter *Patent Anticipation*] ("[T]o get a patent, the invention cannot already be within the possession of the public.").

[11] Kimberly-Clark Corp. v. Johnson & Johnson, 745 F.2d 1437, 1453 (Fed. Cir. 1984) (citing Graham v. John Deere Co., 383 U.S. 1, 6 (1966)).

[12] Items, devices, and activities can also serve as prior art. *See* 35 U.S.C. § 102(a) (2012); Rosaire v. Baroid Sales Div., Nat'l Lead Co., 218 F.2d 72, 74 (5th Cir. 1955) (holding that a patent claiming a prospecting method was invalid because a prior use of the method by another on private property, though obscure, was an anticipation because no action was taken to conceal or exclude public viewing of the prior use).

[13] HERBERT F. SCHWARTZ, PATENT LAW AND PRACTICE 18 (3d ed. 2001).

[14] *See* Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 3(b), 125 Stat. 284, 285-87 (2011) (amending § 102(a) and repealing § 102(g)). Congress did this to harmonize the U.S. patent system with the rest of the word. *Id.* § 3(p), 125 Stat. at 293.

[15] Prior art is also used to gauge nonobviousness — the statutory requirement that bars a patent if the claimed invention is a trivial extension of what is already known. *See* 35 U.S.C. § 103 (2012).

[16] *Id.* § 102(a)(1) (2012) (denying patentability if "the claimed invention was patented . . . before the effective filing date of the claimed invention"); *id.* § 102(a)(2) (denying patentability if "the claimed invention was described in a patent . . . [which] names another inventor and was effectively filed before the effective filing date of the claimed invention").

[17] A patent claim must define "the subject matter which [the applicant] . . . regards as the invention." *Id.* § 112(b) (2012). A claim element further limits the breadth of the claim. *See* 1 DONALD S. CHISUM, CHISUM ON PATENTS, at Gl-3 (2009).

[18] *See, e.g.*, Trintec Indus., Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 1296 (Fed. Cir. 2002); Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989).

example, if an applicant seeks to claim a paper clip made with titanium and nickel, the reference must also disclose a paper clip made with titanium and nickel.[19] Third, the reference must teach a person having ordinary skill in the art ("PHOSITA")[20] how to make the invention (the enablement requirement).[21] If the reference meets all three criteria, it "anticipates" the applicant's claim and renders it unpatentable.[22]

Timing — the first condition — is of crucial importance in the novelty analysis. Every reference has an effective date — the date against which novelty is measured. In the case of publications like magazines or technical journals, the effective date is the date that it becomes accessible to the public.[23] Conversely, the effective date is *not* the date of submission — when the manuscript is mailed or otherwise transmitted to the publisher.[24]

Patent documents — including issued patents and published patent applications — can also serve as prior art.[25] However, their effective

[19] Sean B. Seymore, *Rethinking Novelty in Patent Law*, 60 DUKE L.J. 919, 923 (2011) [hereinafter *Rethinking Novelty*]. In this hypothetical, titanium and nickel are claim elements.

[20] The PHOSITA is a hypothetical construct of patent law akin to the reasonably prudent person in torts. *See* Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1566 (Fed. Cir. 1987). Factors relevant to constructing the PHOSITA in a particular technical field include the sophistication of the technology, the educational level of the inventor, the educational level of active workers in the field, the types of problems encountered in the art, prior art solutions to those problems, and the rapidity with which innovations are made. Envtl. Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 696 (Fed. Cir. 1983).

[21] *In re* Morsa, 803 F.3d 1374, 1377 (Fed. Cir. 2015); Impax Labs., Inc. v. Aventis Pharm., Inc., 545 F.3d 1312, 1314 (Fed. Cir. 2008).

[22] *See* Akzo N.V. v. U.S. Int'l Trade Comm'n, 808 F.2d 1471, 1479 (Fed. Cir. 1986). Thus, "anticipation is the converse of novelty: if an invention lacks novelty, it is anticipated." Holbrook, *Patent Anticipation*, *supra* note 10, at 993.

[23] *See In re* Wyer, 655 F.2d 221, 227 (C.C.P.A. 1981); *accord In re* Klopfenstein, 380 F.3d 1345, 1348 (Fed. Cir. 2004). The C.C.P.A. was a five-judge Article III appellate court on the same level as the U.S. Courts of Appeals. The Federal Courts Improvement Act of 1982 abolished the C.C.P.A. *See* Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 25 (codified as amended in scattered sections of 28 U.S.C.). Soon after its creation, the Federal Circuit adopted C.C.P.A. decisional law as binding precedent. South Corp. v. United States, 690 F.2d 1368, 1370 (Fed. Cir. 1982) (en banc).

[24] *In re* Schlittler, 234 F.2d 882, 887 (C.C.P.A. 1956); *accord* Carella v. Starlight Archery & Pro Line Co., 804 F.2d 135, 139 (Fed. Cir. 1986); *In re* Borst, 345 F.2d 851, 854 (C.C.P.A. 1965) (discussing *Schlittler* and explaining that its holding "represents the settled law" that "knowledge contemplated by section 102(a) must be accessible to the public").

[25] 35 U.S.C. § 102(a) (2012).

dates as references differ from magazines and technical journals. In *Alexander Milburn Co. v. Davis-Bournonville Co.*, the Supreme Court held that the effective date of a patent document is its filing date, *not* the date of issuance or publication.[26] The so-called *Milburn* rule has been codified into the patent statute; it is currently found at 35 U.S.C. § 102(a)(2).[27]

Yet, if public accessibility is the linchpin of prior art, the *Milburn* rule seems counterintuitive. Patent applications are kept in secret by the Patent Office until the application publishes or issues as a patent.[28] This means that a later applicant claiming the same invention cannot learn about an earlier application's existence until that time. This is why § 102(a)(2) references are referred to as "secret" prior art.[29]

Nevertheless, the retroactive effect of the *Milburn* rule can be justified. The earlier-filed patent document is prima facie evidence that the later applicant's claim to the invention has been anticipated — and it makes little sense to ignore that information.[30] The rationale is that the earlier applicant did all that could be done to promptly disclose the invention to the public; any lag due to administrative delays at the Patent Office should be ignored.[31] Of course, in an ideal world, a patent application would be accepted or rejected instantaneously.[32] But unfortunately we do not live in that world.

Thus, the *Milburn* rule seeks to prevent the patenting of preexisting knowledge. But the rule's scope is limited; it only applies to disclosures in earlier-filed patent documents.[33] But what about non-

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[26] *See* Alexander Milburn Co. v. Davis-Bournonville Co., 270 U.S. 390, 402 (1926).

[27] *See infra* Part I.B.

[28] *See* 35 U.S.C. § 122(b)(1) (2012). Most patent applications publish on the eighteen-month date. One exception is when the patent applicant certifies that a counterpart patent application will not be filed in a foreign country. *Id.* § 122(b)(2)(B).

[29] Secret prior art is "prior art that is not generally known or familiar to the public." C. Douglas Thomas, *Secret Prior Art — Get Your Priorities Straight!*, 9 HARV. J.L. & TECH. 147, 149 (1996). Under the 1952 Act there are two types of secret prior art — earlier filed patent applications and (secret) prior invention by another. *See* 35 U.S.C. § 102(e), (g) (2006) (pre-AIA). The AIA eliminates the latter. *See* Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 3, 125 Stat. 284, 285-87 (2011) (repealing § 102(g)).

[30] *See infra* Part I.C.

[31] Hazeltine Research, Inc. v. Brenner, 382 U.S. 252, 255 (1965); *Milburn*, 270 U.S. at 401. Of course, there is also a fairness rationale of not allowing the later filer to sue the earlier filer for patent infringement if the earlier filer's disclosure enabled the later filer's patent claim.

[32] *See infra* text accompanying note 57.

[33] *See* 35 U.S.C. § 102(a)(2) (2012); 35 U.S.C. § 102(e) (2006) (pre-AIA).

patent documents like peer-reviewed manuscripts submitted to technical journals? Suppose a researcher discloses an invention in a manuscript that is subsequently submitted for publication. The manuscript undergoes peer review before publishing as a journal article over a year later. In the interim, someone else independently invents and files a patent application claiming the identical invention. Since the article publishes after the patent application is filed, the article cannot serve as prior art. Yet the resulting patent would, in fact, claim preexisting knowledge.[34] To make matters worse, the patentee could block the researcher from practicing the invention, even though the researcher invented first and did all that could be done to promptly put the manuscript into the public domain.[35] This outcome for manuscript prior art is hard to justify and frustrates basic goals of the patent system.

This Essay offers a solution to the problem. It argues that the *Milburn* principle should be extended to non-patent documents like manuscripts which (like patent documents) are on a trajectory toward publication. Thus, a manuscript would now qualify as a prior art reference with an effective date that relates back to its submission date.[36] The submission would be prima facie evidence of anticipation.[37] And any delays due to peer review would have no bearing on the effective date. Backdating makes sense because a manuscript, like an earlier-filed patent application, is in the pipeline to

[34] It is worth noting that under the (pre-AIA) first-to-invent system, the patent could possibly be invalidated under (now repealed) 35 U.S.C. § 102(g) (2006) (barring a patent if the claimed invention "was made in this country by another inventor who had not abandoned, suppressed, or concealed it" before the patent applicant's date of invention). *See supra* note 29; *infra* note 62.

[35] *See infra* Part II. The AIA will afford a secret prior inventor a limited defense to patent infringement in certain circumstances. 35 U.S.C. § 273 (2012). The accused infringer must prove, by clear and convincing evidence, that the patented subject matter was "commercially used" in the United States for at least one year prior to the earlier of the (1) "effective filing date of the claimed invention"; or (2) "the date on which the claimed invention was disclosed to the public in a manner that qualified for the exception from prior art under section 102(b)." *Id.* § 273(a)–(b). There is also a "university exception," wherein patents owned by (or under an obligation to be assigned to) universities are exempt from assertion of the prior user defense. *Id.* § 273(e)(5).

[36] Again, this is when the manuscript is mailed or otherwise transmitted to the publisher. *See supra* note 24; *infra* Part III.B.

[37] *Cf. In re* Bayer, 568 F.2d 1357, 1361 (C.C.P.A. 1978) (explaining that the earlier-filed patent document "constitutes prima facie evidence that the [later-filing] applicant is *not* the first inventor of the invention in controversy" (emphasis added)).

public disclosure.[38] So I propose that § 102(a)(2) be amended to include manuscript prior art.[39]

However, the central argument of this Essay does not stop with the assertion that the *Milburn* rule should be extended. The claim is broader: I argue that the *Milburn* rule is actually *more justifiable* for peer-reviewed manuscripts than it is for patent documents. This is because manuscripts are generally more enabling — that is, more technically robust sources of prior art — than patent documents because manuscripts must comply with the norms of science (including its heightened disclosure requirements) and strictures of peer review.[40]

This Essay advances the patent literature in three ways. First, it is, to the best of my knowledge, the only scholarly contribution devoted exclusively to the *Milburn* rule. In fact, the rule has received almost no attention from legal scholars. Second, it raises interesting theoretical and normative questions about preexisting knowledge and the events and activities that should qualify as novelty-defeating prior art. Third, extending the *Milburn* principle to include manuscripts would greatly expand the universe of prior art. Given the seemingly infinite number of technical journals, backdating a manuscript's prior art effective date to its submission date could render *a lot* of inventions unpatentable — or issued patents invalid, as the case may be. Thus, this Essay contributes to ongoing discussions about whether patents are too easy to obtain (or too hard to invalidate) and broader policy debates over patent reform.

This Essay proceeds as follows. Part I discusses the *Milburn* principle. It begins by exploring *Milburn* and Justice Holmes's logic and rationale for crafting the rule that emerged. After discussing the rule's subsequent codification, this Part then examines critiques and policy justifications for the *Milburn* principle and the notion of backdating knowledge. Part II offers a new novelty paradigm which, by extending the *Milburn* principle to include non-patent documents, would prevent the patenting of preexisting knowledge. It begins by explaining why patent documents and non-patent documents like manuscripts should be treated the same way for prior art purposes because both are on a trajectory toward public disclosure. To bolster this argument, this Part then explains why the *Milburn* principle is more justifiable for peer-reviewed manuscripts than for patent

[38] *See* discussion *infra* Part II.

[39] *See infra* Section II.B.3.

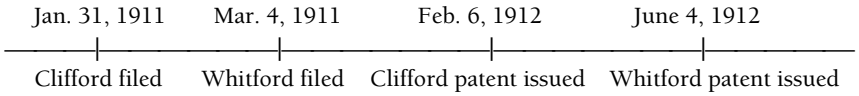
[40] *See infra* Section II.B.2.

documents. Next, this Part describes how to amend the patent statute to incorporate the new novelty rule. Part III responds to possible objections to my argument. Finally, Part IV discusses how expanding the universe of prior art would improve patent quality and serve the public interest.

I. THE *MILBURN* PRINCIPLE

A. Holmes's Logic

To better understand the *Milburn* rule, it is important to consider the context in which it developed. *Milburn* was a patent infringement suit brought by the Davis-Bournonville Company, the owner of the Whitford patent which claimed a welding apparatus.[41] The accused infringer argued that the Whitford patent was invalid because Whitford was not the first inventor as evinced by an earlier patent granted to Clifford.[42] Whitford filed a patent application on March 4, 1911, which issued as a patent on June 4, 1912.[43] Clifford filed an application on January 31, 1911 which issued as a patent on February 6, 1912.[44] Clifford's earlier-filed patent application disclosed the identical welding apparatus but did not claim it.[45]



Milburn arose when the United States followed the first-to-invent regime, meaning that the first to invent was entitled to a patent.[46]

[41] Alexander Milburn Co. v. Davis-Bournonville Co., 270 U.S. 390, 399 (1926).

[42] *Id.*

[43] *Id.*

[44] *Id.*

[45] The disclosed-but-unclaimed subject matter fell into the public domain. *See infra* note 55. The situation would have been different if Whitford and Clifford both *claimed* the same invention. Under the first-to-invent system, patent rights are only awarded to the first inventor. 35 U.S.C. § 102(g) (2006) (pre-AIA) (barring issuance of a patent when another invented first). When two parties claim the same invention, the Patent Office institutes an "interference" proceeding to determine priority (i.e., which party is entitled to a patent). *Id.*

[46] Seymour v. Osborne, 78 U.S. (11 Wall.) 516, 552 (1870); 1 ROBINSON, *supra* note 2, at 529-30. However, under the first-to-invent regime, the first inventor could lose the right to a patent if the claimed invention "was made in this country by another inventor who had not abandoned, suppressed, or concealed it" before the patent applicant's date of invention. 35 U.S.C. § 102(g)(2) (2006) (pre-AIA). Thus,

Although Clifford's filing of his patent application showed that he invented first,[47] that event did not qualify as prior art under the then-existing interpretation of the law. As of Whitford's invention date, Clifford's patent application was being held in confidence at the Patent Office. It was neither a "patent" nor a "printed publication" and did not constitute subject matter that was "known or used."[48]

Nevertheless, the Supreme Court held that the prior disclosure in Clifford's patent application qualified as prior art against Whitford's later-filed application.[49] Writing for the Court, Justice Holmes explained that since "one really must be the first inventor in order to be entitled to a patent,"[50] Clifford's prior disclosure "made it impossible for Whitford to claim the invention at a later date"[51] because it "show[ed] that Whitford was *not* the first inventor."[52] Thus, Clifford's prior disclosure of the invention was effective as anticipatory prior art as of its filing date.[53]

Justice Holmes offered a straightforward rationale for the holding. To begin, he explained that prior publication in a periodical defeats patentability because the invention is dedicated to the public.[54] Clifford's disclosure, according to Justice Holmes, should have the same effect as a periodical because Clifford "had done all that he could do to make his description public" by filing the patent application.[55]

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the first inventor's prior inventive activity could serve as prior art even if the first inventor decided not to pursue a patent. *See* Corona Cord Tire Co. v. Dovan Chem. Corp., 276 U.S. 358, 384-85 (1928).

[47] Under the first-to-invent regime, the presumptive date of invention is the filing date. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 449 (Fed. Cir. 1986).

[48] *See* REV. STAT. § 4886 (1875), *as amended*, 29 Stat. 692 (1897) ("Any person who has invented . . . any new and useful art, machine, manufacture, or composition of matter . . . not known or used by others in this country . . . before his invention[,] . . . and not patented or described in any printed publication in this or any foreign country . . . before his invention . . . may . . . obtain a patent therefor.").

[49] *Milburn*, 270 U.S. at 401.

[50] *Id.* at 400.

[51] *Id.* at 401.

[52] *Id.* (emphasis added); *cf. In re* Frilette, 412 F.2d 269, 274 (C.C.P.A. 1969) (explaining that the earlier-filed patent document "is prima facie evidence that the applicant is not, with reference to the subject matter disclosed in the patent, the first inventor").

[53] *See Milburn*, 270 U.S. at 401-02.

[54] *Id.* at 400-01.

[55] *Id.* at 401. It is a well-established rule in patent law that "subject matter disclosed but not claimed in a patent application is dedicated to the public." Unique Concepts, Inc. v. Brown, 939 F.2d 1558, 1562-63 (Fed. Cir. 1991) (citing Miller v. Bridgeport Brass Co., 104 U.S. (14 Otto) 350, 352 (1881) ("[T]he claim of a specific

That disclosure would publish as soon as the Patent Office did its work.[56] If the Patent Office had processed Clifford's application immediately, there would be no question that the disclosure in the issued patent would bar Whitford's claim.[57] But according to Justice Holmes,

> [D]elays of the [P]atent [O]ffice ought not to cut down the effect of what has been done . . . . We see no reason in the words or policy of the law for allowing Whitford to profit by the delay and make himself out to be the first inventor when he was not so in fact, when Clifford had shown knowledge inconsistent with the allowance of Whitford's claim.[58]

The rule that emerged — the *Milburn* rule — is that a patent document that discloses the invention is fully effective as a reference as of its filing date.[59] This is akin to the "mailbox rule" in contract law.[60] The basic idea is that public knowledge of the invention will be inferred as of the patent document's filing date.[61]

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device . . . and an omission to claim other devices . . . are . . . a dedication to the public of that which is not claimed. It is a declaration that that which is not claimed is either not the patentee's invention, or, if his, he dedicates it to the public.")); s*ee also* Johnson & Johnston Assocs. v. R.E. Serv. Co., 285 F.3d 1046, 1054 (2002) (en banc) ("[W]hen a patent drafter discloses but declines to claim subject matter . . . this action dedicates that unclaimed subject matter to the public.").

[56] Public disclosure through patent issuance was necessary for the patent application to qualify as prior art. *See* 35 U.S.C. § 122(b)(1)–(2) (2012); *see also infra* text accompanying note 99.

[57] Criticisms about the lag between patent application filing and issuance continue to the present day. *See, e.g.*, Iain M. Cockburn et al., *Are All Patent Examiners Equal? Examiners, Patent Characteristics, and Litigation Outcomes*, *in* PATENTS IN THE KNOWLEDGE-BASED ECONOMY 19, 29 (Wesley M. Cohen & Stephen A. Merrill eds., 2003) (discussing internal and external forces that contribute to the lag). The Patent Office has taken steps to speed things up. *See* U.S. PATENT & TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT FISCAL YEAR 2016, at 3 (2016) (providing statistics).

[58] *Milburn*, 270 U.S. at 401.

[59] U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2136.04 (9th ed. 2014) [hereinafter MPEP].

[60] *See* RESTATEMENT (SECOND) OF CONTRACTS § 63(a) (AM. LAW INST. 1981) (explaining that under the "mailbox rule," acceptance of an offer is effective upon dispatch regardless of when it reaches the offeror).

[61] Lamb-Weston, Inc. v. McCain Foods, Ltd.,78 F.3d 540, 549 (Fed. Cir. 1996).

B. Codification

A unique aspect of the *Milburn* rule is its retroactive effect — the patent document constitutes prior art as of its filing date, not the date of its public disclosure.[62] The *Milburn* rule was codified in the Patent Act of 1952 as § 102(e).[63] The original version of § 102(e) only applied to disclosures in earlier-filed patent applications that ultimately issued as a patent — the precise factual scenario in *Milburn*.[64] The statute was amended in 1999, when the United States began publishing patent applications.[65] Since that time, an application that publishes or issues as a patent is deemed prior art as of its filing date.[66]

The *Milburn* rule was recodified in the AIA.[67] The present version of the rule appears in § 102(a)(2), which denies a patent if the claimed invention "was described in a patent . . . or in an application for patent [that is] published . . . in which the patent or application . . . names

[62] Under the (pre-AIA) first-to-invent system, § 102(g) could also serve as a source of backdated prior art. *See* 35 U.S.C. § 102(g)(2) (2006) (barring a patent if the claimed invention "was made in this country by another inventor who had not abandoned, suppressed, or concealed it" before the patent applicant's date of invention); ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 464 (6th ed. 2013) ("While § 102(g) prior art must be on a trajectory toward public disclosure, it may have an effective date prior to the time it becomes public."); *see also supra* note 29 and accompanying text (discussing "secret" prior art).

[63] As noted in the 1952 report of the Senate Committee on the Judiciary, § 102(e) "is another well-recognized condition imposed by a decision of the Supreme Court which was not expressed in the existing law; for the purpose of anticipating subsequent inventors, a patent disclosing the subject matter speaks from the filing date of the application disclosing the subject matter." S. REP. NO. 1979, at 4 (1952), *reprinted in* 1952 U.S.C.C.A.N. 2394, 2399. This subsection of § 102 "is new and enacts the rule of *Milburn v. Davis-Bournonville*, 270 U.S. 390, by reason of which a United States patent disclosing an invention dates from the date of filing the application for the purpose of anticipating a subsequent inventor." *Id.* at 13.

[64] *See* 35 U.S.C. § 102(e) (1952) (denying a patent if "the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant").

[65] Most patent applications publish eighteen months after filing. *See* American Inventor's Protection Act of 1999, Pub. L. No. 106-113, § 4502, 113 Stat. 1501A-552, 1501A-561 (1999) (codified as amended at 35 U.S.C. § 122(b)); *supra* note 28 and accompanying text. The Act amended § 102(e) to deny a patent if the invention is described in an issued patent filed by another before invention by the applicant (recodification of the *Milburn* holding) or a published U.S. patent application and certain international patent applications which publish in English filed by another before invention by the applicant. *Id.* § 4505, 113 Stat. at 1501A-565 (codified as amended at 35 U.S.C. § 102(e)).

[66] *See* 35 U.S.C. § 102(a)(2).

[67] *See id.*

another inventor and was effectively filed before the effective filing date of the claimed invention."[68] Thus, an earlier-filed patent application *can only* serve as § 102(a)(2) prior art if it either publishes or issues as a patent. So § 102(a)(2) "define[s] the point at which . . . published applications and issued patents serve as prior art against others."[69]

Section 102(a)(2) prior art is often referred to as a type of "secret" prior art[70] because the Patent Office keeps a patent application confidential until it publishes (usually eighteen months after the filing date) or issues as a patent.[71] Once the document becomes publicly available, it qualifies as prior art for use against other inventors as of its filing date.[72] Thus, § 102(a)(2) has a publicity requirement,[73] but "it simply comes later in the game, acting as a condition precedent."[74]

C. Backdated Knowledge?

Although the *Milburn* rule, § 102(e), and § 102(a)(2) have received virtually no attention in the scholarly literature, the handful of commentators who have opined generally object to the notion of backdating a prior art reference. One commentator argues that *Milburn* is a legal fiction that has no basis in fact.[75] Another commentator

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[68] *Id.* This recodification "represents another instance in which common law rulings in patent law are perpetuated in a new generation of statutory enactments." Robert P. Merges, *Priority and Novelty Under the AIA*, 27 BERKELEY TECH. L.J. 1023, 1037-38 (2012).

[69] MARTIN J. ADELMAN ET AL., CASES AND MATERIALS ON PATENT LAW 233 (4th ed. 2015). There are two additional points worth noting. First, the AIA creates three exceptions — i.e., scenarios where a prior disclosure in an earlier-filed patent document will not serve as prior art. *See infra* Section II.B.3 (discussing § 102(b)(2)). Second, § 102(a)(2) references can be used to gauge nonobviousness. *See* Hazeltine Research, Inc. v. Brenner, 382 U.S. 252, 255 (1965) (holding that a pending patent application is available as prior art for determining nonobviousness); *supra* note 15 and accompanying text.

[70] *See supra* note 29 and accompanying text.

[71] *See supra* note 28 and accompanying text.

[72] 35 U.S.C. § 102(a) (2012).

[73] "The most appropriate date for a published application or issued patent to have prior art effect might seem to be the date it actually [publishes or] issues" from the Patent Office because "patent law usually does not allow references that are not available to the public, such as trade secrets, to have patent-defeating effect." ADELMAN ET AL., *supra* note 69, at 233.

[74] F. SCOTT KIEFF ET AL., PRINCIPLES OF PATENT LAW: CASES AND MATERIALS 397 (6th ed. 2013).

[75] Paul W. Leuzzi, *A Re-Evaluation of the Use of 35 U.S.C. § 102(e), Secret Prior Art, in Obviousness Determinations*, 29 IDEA 167, 170 (1988).

argues that prior art should refer to knowledge "then available" or knowable.[76]

Some might argue that the *Milburn* rule introduces uncertainty into the patenting process. This is because an applicant has no way of knowing about potential patent-defeating § 102(a)(2) references until the Patent Office either publishes the earlier-filed application or grants a patent for it.[77] To be sure, the retroactive effect of a § 102(a)(2) reference raises interesting theoretical questions about preexisting knowledge and the meaning of prior art.

Two scholars advance rationales for the *Milburn* rule, one pragmatic and the other rooted in policy. On a pragmatic level, Peter Menell argues that "[t]he fact that the knowledge was not publicly known is outweighed by the Patent Office's knowledge of the invention and its unique role in making patent determinations."[78] Even though Menell is correct that it makes little sense for the Patent Office to ignore information material to patentability contained in the agency's files, I argue that the *Milburn* rule should be extended to peer-reviewed manuscripts because they (like patent applications) are also on a trajectory toward public disclosure.[79]

Donald Chisum offers a policy rationale for the *Milburn* rule that responds to concerns about fairness:

> Making secret material prior art might be questioned on grounds of fairness, but fairness to individual inventors is not the primary concern of the patent system. Rather, that system gives the inventor the right to a legal monopoly in exchange for an actual advance in the useful arts, but not in exchange for that which the inventor reasonably, though erroneously, believes to be such an advance. It is entirely appropriate to include in prior art material which is not, but will in due course become, publicly available.[80]

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[76] Harold C. Wegner, *Patent Law Simplification and the Geneva Patent Convention*, 14 AIPLA Q.J. 154, 176 (1986).

[77] MERGES & DUFFY, *supra* note 62, at 413, 464 ("Inventors might accurately view . . . secret prior art as a 'wild card' that can emerge without warning to destroy their patent rights.").

[78] PETER S. MENELL ET AL., PATENT CASE MANAGEMENT JUDICIAL GUIDE 14-57 (3d ed. 2016).

[79] *See infra* Part II.A.

[80] Donald S. Chisum, *Sources of Prior Art in Patent Law*, 52 WASH. L. REV. 1, 12 (1976).

Carrying this rationale one step further, allowing the later inventor to claim the invention would allow the later inventor to assert a property right over someone who filed (and attempted to publicly disclose) first.[81]

II. RECONCEPTUALIZING ANTICIPATORY KNOWLEDGE

A. Understanding "Pipeline" Disclosures

The principal criticism of the *Milburn* rule is that it affords prior art status to the prior knowledge disclosed in a patent application that was not publicly available at the time of filing. The courts acknowledge the discomfort with § 102(a)(2) prior art and recognize arguments that "that which is secret should be in a different category from knowledge which is public."[82] But the courts make sense of the rule because the prior disclosure is not destined to remain secret — it is "on its way, in due course, to publication."[83] Indeed, an earlier-filed patent application *can only* serve as § 102(a)(2) prior art if it either publishes or issues as a patent.[84]

Section 102(a)(2) prior art can be aptly described as a pipeline disclosure because it is on a trajectory toward publication. The qualifier *pipeline* denotes the gap in time between the date the prior inventor submitted the disclosure to the public and the date that the public becomes aware of it. But an earlier-filed patent application is not the only type of pipeline disclosure. Another type is a manuscript submitted for publication in a peer-reviewed technical journal.[85] This type of disclosure enters the pipeline when a researcher writes up the experimental details about the work that has been done and submits the manuscript to a peer-reviewed journal for publication. On the submission date,[86] the researcher does all that can be done to immediately put the knowledge disclosed in the manuscript into the public domain. However, the knowledge is not immediately available to the public because of publication delays associated with the peer

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[81] *See* MERGES & DUFFY, *supra* note 62, at 411-12.

[82] *In re* Hilmer, 359 F.2d 859, 877 (C.C.P.A. 1966).

[83] *Id.*; *cf.* OddzOn Prods., Inc. v. Just Toys, Inc., 122 F.3d 1396, 1402 (Fed. Cir. 1997) (noting that prior art refers to "subject matter that is, *or eventually becomes*, public," including "the 'secret prior art' of § 102(e)" (emphasis added)).

[84] *See infra* text accompanying note 99.

[85] Peer review refers to the screening of research results by colleagues in a particular discipline. Peter Hernon & Candy Schwartz, *Peer Review Revisited*, 28 LIBR. & INFO. SCI. RES. 1, 1 (2006).

[86] *See supra* text accompanying note 24. Journals print the "manuscript received" date on the published version.

review process. Peer review, like the early stages of the patent application process, occurs in confidence.[87] Months later, the earlier-disclosed knowledge exits the pipeline and becomes publicly available when the manuscript publishes as a journal article.[88]

Yet, patent law treats earlier-filed patent applications and manuscripts differently for prior art purposes. The former is effective as prior art on its filing date. This is the *Milburn* rule. The latter, by contrast, is not considered prior art on its submission date.[89] Rather, a manuscript only becomes prior art when it becomes publicly accessible,[90] which might be the date that a version appears on the Internet,[91] or when a member of the public actually receives a copy in the mail.[92]

In *In re Schlittler*, the U.S. Court of Customs and Patent Appeals ("C.C.P.A.")[93] offered a rationale for affording pipeline disclosures different prior art effective dates.[94] Specifically, the court had to decide if an article in a chemistry journal should be treated the same way as a

[87] *See* IRENE HAMES, PEER REVIEW AND MANUSCRIPT MANAGEMENT IN SCIENTIFIC JOURNALS 14 (2007) ("[T]he *actual submission* of manuscripts is confidential, as well as the content and any information on the review of that manuscript . . . .").

[88] The time that it takes for a manuscript to be peer reviewed, accepted for publication, and eventually published varies by discipline. *See* Bo-Christer Björk & David Solomon, *The Publishing Delay in Scholarly Peer-Reviewed Journals*, 7 J. INFORMETRICS 914, 914-23 (2013). A recent study shows the delay in chemistry, biomedicine, and engineering is about nine months; physics is just over ten months; and earth science is about 12 months. *See id.* at 919.

[89] *See In re* Schlittler, 234 F.2d 882, 887 (C.C.P.A. 1956) ("[T]he mere placing of a manuscript in the hands of a publisher does not necessarily make it available to the public . . . ."), *cited with approval in* MPEP, *supra* note 59, § 2128.02.

[90] Carella v. Starlight Archery & Pro Line Co., 804 F.2d 135, 139 (Fed. Cir. 1986).

[91] Some scientific journals frequently make PDF versions of accepted articles available on the journal's website before being printed on paper in a bound journal. For example, the American Chemical Society makes two types of manuscripts available online. "Just Accepted" manuscripts are peer-reviewed manuscripts accepted for publication which are posted online prior to technical editing. *See Just Accepted Manuscripts*, J. AM. CHEMICAL SOC'Y, http://pubs.acs.org/toc/jacsat/0/ja (last visited Feb. 25, 2016). The purpose is "to expedite the dissemination of scientific information as soon as possible after acceptance." *Id.* "As Soon As Publishable" (ASAP) manuscripts have been technically edited and are the final version of the article. *Id.*

[92] The older, pre-Internet cases set forth this rule. *See* Protein Found., Inc. v. Brenner, 260 F. Supp. 519, 520-21 (D.D.C. 1966) (holding that a magazine is effective as a printed publication on the date it reaches the addressee, not on the date of mailing), *cited with approval in Carella*, 804 F.2d at 139.

[93] *See supra* note 23.

[94] *Schlittler*, 234 F.2d at 887.

patent application for prior art purposes.[95] In the case of earlier-filed patent applications, the court determined that *Milburn* "did not hold that prior knowledge, to be anticipatory, need not be public, but did hold that the filing of a patent application on which a patent is later granted *makes the invention disclosed public property* as much as an actual publication in a periodical."[96] Yet "[t]he situation is different with respect to the submission of a manuscript to a *private* publisher who may make it public or not as he sees fit."[97]

The *Schlittler* court's rationale is unconvincing. Filing a patent application does not mean that the document will inevitably publish. For instance, if the applicant abandons the application before the eighteen-month date,[98] it will remain secret forever.[99] The broader point is that there are events which can prevent *both* types of pipeline disclosures from entering the public domain.

Nevertheless, the distinction persists.[100] That a manuscript cannot become prior art until publication means that a later applicant can get a patent on knowledge that was first disclosed by someone else. Put differently, the disparate treatment of pipeline disclosures allows patents to issue which claim preexisting knowledge.

B. Novelty and Manuscript Prior Art

1. The *Milburn* Principle

Despite criticisms, the *Milburn* rule is an enduring part of U.S. patent law. It was most recently affirmed by recodification in the AIA.[101] Congress has embraced the idea that a third-party's placement of an invention on the trajectory toward disclosure, as evinced by the filing of a patent application, is sufficient to anticipate a later-filer's claim to it. The rule unquestionably fulfills the basic purpose of patent law's novelty requirement — to protect preexisting knowledge.[102]

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[95] *Id.* at 884.

[96] *Id.* at 887 (emphasis added).

[97] *Id.* (emphasis added).

[98] *See supra* notes 28 and 65.

[99] *See* 35 U.S.C. § 122(b)(2)(A) (2012). Even before Congress amended the patent statute to allow the publication of patent applications, an applicant could abandon an application before patent issuance. When this happens, the application remains secret forever. *See* 37 C.F.R. § 1.138(c) (2015); MPEP, *supra* note 59, § 1125.

[100] *See supra* note 89.

[101] 35 U.S.C. § 102(a)(2).

[102] *See supra* text accompanying notes 1–3.

Accepting the *Milburn* principle raises a broader question. It is hard to understand why manuscripts should be treated differently than patent documents. I urge that they should not; manuscripts should be effective as prior art as of their submission date as long as the manuscript eventually publishes. So I contend that there should be a unitary anticipation standard for pipeline disclosures. Treating manuscripts like earlier-filed patent documents for prior art purposes would allow patent law to better protect preexisting knowledge.[103]

However, my argument is two-fold. First, I contend that the *Milburn* principle is generalizable — all pipeline disclosures should be treated the same way for prior art purposes. Second, I claim that the *Milburn* principle *is more justifiable* for manuscripts than it is for patent documents. The next subsection develops this argument.

2. Satisfying the Enablement Requirement

My argument that the *Milburn* principle is more justifiable for manuscripts than for patent documents requires a closer look at what constitutes anticipatory prior art. Recall that to anticipate, an asserted reference must: (1) come earlier in time; (2) disclose subject matter that is identical to what is later claimed; and (3) be enabling.[104] My focus is on the third condition, enablement, which requires that the asserted reference "teach a [PHOSITA] — at the time of filing — to make or carry out what it discloses in relation to the claimed invention without undue experimentation."[105]

[103] *See infra* Part IV.A.

[104] *See supra* notes 16–21 and accompanying text.

[105] *In re* Morsa, 803 F.3d 1374, 1377 (Fed. Cir. 2015) (citing *In re* Antor Media Corp., 689 F.3d 1282, 1289-90 (Fed. Cir. 2012)). It is important to note that enablement questions typically arise in two contexts in patent law. Section 112(a) of the Patent Act compels a patent applicant to submit a written description that enables a PHOSITA to make and use the full scope of the claimed invention without undue experimentation. *See* 35 U.S.C. § 112(a) (2012); *In re* Wands, 858 F.2d 731, 737 (Fed. Cir. 1988). Unlike the "statutory" or patent-supporting form of enablement which places an outer limit on claim scope, the "anticipatory" or patent-defeating form pertaining to prior art references is a "judicially imposed limitation" on § 102 that the reference's disclosure be sufficiently enabling. *See In re* LeGrice, 301 F.2d 929, 939 (C.C.P.A. 1962). This means that the asserted reference need only teach a PHOSITA how to *make* the disclosed subject matter. *See* Rasmusson v. SmithKline Beecham Corp., 413 F.3d 1318, 1325-26 (Fed. Cir. 2005); *In re* Hafner, 410 F.2d 1403, 1405 (C.C.P.A. 1969).

a. The Doctrine of Anticipatory Enablement

Determining whether a disclosure in an asserted reference is enabling for novelty-defeating purposes is a legal conclusion that rests on underlying factual inquiries.[106] The U.S. Court of Appeals for the Federal Circuit ("Federal Circuit")[107] set forth several factors relevant to the enablement analysis in *In re Wands*.[108] They are: (1) the amount of direction or guidance presented in the disclosure, (2) the existence of working examples, (3) the nature of the invention, (4) the predictability or unpredictability of the art, (5) the PHOSITA's level of skill, (6) the state of the prior art, (7) the breadth of the claims, and (8) the quantity of experimentation necessary to practice the claimed invention.[109]

In the anticipation context, the Federal Circuit has held that — for the sake of expediency — a patent examiner can presume that an asserted reference is enabling.[110] And it is important to note, for reasons that will become clear shortly, that this presumption applies to *all* subject matter disclosed in the asserted reference.[111] Thus, the examiner can reject an applicant's claim for a lack of novelty without conducting a *Wands* analysis to determine whether the asserted prior art reference actually enables the subject matter.[112]

From a technical standpoint, the presumption rests on shaky ground. It is hard to believe that *all* asserted prior art is enabling; particularly references that disclose complex,[113] unpredictable,[114]

106 *See* Sitrick v. Dreamworks, LLC, 516 F.3d 993, 999 (Fed. Cir. 2008).

107 The U.S. Court of Appeals for the Federal Circuit has jurisdiction over appeals from the Patent Office and district court cases arising under the patent laws. The court was created by the Federal Courts Improvement Act of 1982. Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 25 (codified as amended in scattered sections of 28 U.S.C.).

108 *Wands*, 858 F.2d at 737.

109 *See id.* (factors reordered from original text). The *Wands* factors are interrelated. For example, if the PHOSITA is really smart (factor five), an applicant need not disclose what the PHOSITA already knows or can easily figure out (factors one and two). *See* Spectra-Physics, Inc. v. Coherent, Inc., 827 F.2d 1524, 1534 (Fed. Cir. 1987).

110 *In re* Antor Media Corp., 689 F.3d 1282, 1287 (Fed. Cir. 2012) (citing Amgen v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1355 (Fed. Cir. 2003)).

111 *Id.*

112 *See Amgen*, 314 F.3d at 1355. Once the examiner makes a prima facie case of anticipation, an applicant who wants to argue that the asserted reference is nonenabling must establish this — through persuasive argument or proof — by a preponderance of the evidence. *See Antor Media*, 689 F.3d at 1287-88 (citing *In re* Sasse, 629 F.2d 675, 681 (C.C.P.A 1980)).

113 An enabling disclosure is crucial for complex inventions because the PHOSITA

undeveloped, or underdeveloped subject matter. However, the Federal Circuit ignores these concerns:

> [I]t is procedurally convenient to place the burden on an applicant who is in a better position to show, by experiment or argument, why the disclosure in question is not enabling . . . . It would be overly cumbersome, perhaps even impossible, to impose on the [Patent Office] the burden of showing that a cited piece of prior art is enabling. The [Patent Office] does not have laboratories for testing disclosures for enablement.[115]

So it seems that the presumption is based on the practical realities of patent examination. Nonetheless, it allows a questionable disclosure in a prior art reference — which might be inadequate to enable the subject matter for patent-obtaining purposes[116] — to potentially defeat a later claim by a subsequent inventor who *can* enable the subject matter.[117]

b. Pipeline Disclosures as Teaching Documents

The presumption of enablement applies to all prior art, including pipeline disclosures asserted for § 102(a)(2) purposes. Although the

"must rely heavily, if not exclusively, on the instruction provided within the four corners of the patent document in order to practice the invention." Sean B. Seymore, *Patently Impossible*, 64 VAND. L. REV. 1491, 1528 (2011). Thus, the lack of a detailed teaching means that a PHOSITA will probably need to engage in undue experimentation to practice the full scope of the invention. *See id.*

[114] Many enablement questions turn on whether the technology is "unpredictable" or "predictable." *See* Sean B. Seymore, *Heightened Enablement in the Unpredictable Arts*, 56 UCLA L. REV. 127, 132-39 (2008). The courts regard fields like chemistry, biotechnology, and pharmacology as "unpredictable" because PHOSITAs in these fields often cannot predict whether a reaction protocol that works for one embodiment will work for others. *See* Cedarapids, Inc. v. Nordberg, Inc., No. 95-1529, 1997 WL 452801, at *2 (Fed. Cir. Aug. 11, 1997) (explaining that in the chemical arts, "a slight variation . . . can yield an unpredictable result or may not work at all"). Applied technologies like electrical and mechanical engineering are often regarded as "predictable" arts because they are rooted in well-defined, predictable factors. *See In re* Vaeck, 947 F.2d 488, 496 (Fed. Cir. 1991).

[115] *Antor Media*, 689 F.3d at 1288; *see also In re* Morsa, 713 F.3d 104, 110 (Fed. Cir. 2013) (reaffirming the procedural basis for the presumption); *Amgen*, 314 F.3d at 1355 & n.21 (further elaborating on the policy basis for the presumption).

[116] *See In re* Hafner, 410 F.2d 1403, 1405 (C.C.P.A. 1969) (noting that a disclosure sufficient to anticipate for patent-defeating purposes may be insufficient to support the patentability of a claim under § 112).

[117] *See id.*; Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621, 660 (2010) [hereinafter *Teaching Function*].

presumption rests on shaky ground,[118] I contend that it is more justifiable for manuscripts submitted to peer-reviewed technical journals than for patent documents. Manuscripts, as I explain below, tend to be *more enabling* — and thus more technically robust sources of prior art — than patent documents. This supports my broader argument that the *Milburn* principle — backdating a reference to its submission or filing date — is more justifiable for journal manuscripts than for patent documents.

Whether a prior art reference is enabling depends in large part on what it teaches. The first two *Wands* factors deal directly with the teaching function.[119] The ability of a prior art reference to teach a PHOSITA how to make what it discloses hinges on the type of disclosure provided. The best type of disclosure consists of so-called "working examples"[120] which describe in detail experiments actually performed that produce successful results. This type of disclosure reads like a cookbook and allows a PHOSITA to easily replicate what is described.[121] At the other extreme is a "prophetic" disclosure which, as the name implies, is based on predicted or simulated results rather than work actually performed or results actually achieved.[122] Since prophetic disclosures are inherently prone to uncertainty and speculation, a PHOSITA has no guarantee that such subject matter can be made or will work as described.[123]

Manuscripts submitted to peer-reviewed technical journals contain working examples — the best type of disclosure. The norms of science compel the disclosure of the experimental methods and results of actual work that has been successfully done as a prerequisite for publication.[124] Manuscripts typically include numerous working examples and other information to allow others in the field to readily replicate what is described.[125]

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[118] *See* Sean B. Seymore, *The Presumption of Patentability*, 97 MINN. L. REV. 990, 1018-22 (2013).

[119] *Supra* text accompanying note 109.

[120] MPEP, *supra* note 59, § 2164.02.

[121] *See* Seymore, *Teaching Function*, *supra* note 117, at 641-46.

[122] MPEP, *supra* note 59, § 2164.02.

[123] *See* Seymore, *Teaching Function*, *supra* note 117, at 631-32.

[124] *See* Dmitry Karshtedt, *Limits on Hard-to-Reproduce Inventions: Process Elements and Biotechnology's Compliance with the Enablement Requirement*, 3 HASTINGS SCI. & TECH. L.J. 109, 114 (2011) ("[A] scientific publication typically has to describe an actually completed experiment, while a patent specification does not.").

[125] *See generally* VERNON BOOTH, COMMUNICATING IN SCIENCE (2d ed. 1993); ROBERT A. DAY, HOW TO WRITE AND PUBLISH A SCIENTIFIC PAPER (1st ed. 1979). The basic purpose of peer review is to serve as a quality-control filter to prevent the publication

The story is very different for patent documents. The main reason why is because a patent document asserted as a reference for § 102(a)(2) purposes discloses both claimed *and* unclaimed subject matter. And as shown in *Milburn* itself, it is the *unclaimed* subject matter in earlier-filed patent document that allegedly anticipates the later filer's claim to it.[126] One might ask why the first inventor would disclose something and not claim it; yet there are any number of reasons.[127] More important is the rule that unclaimed subject matter in a patent document is not subject to the enablement requirement of § 112(a).[128] In fact, unclaimed subject matter is not examined by the Patent Office.[129]

That unclaimed subject matter need not be enabling raises several points relevant to my argument. First, there is a good chance that unclaimed subject matter in a patent document is nonenabled. And given that it is not scrutinized, such disclosures might be more

of results that are questionable, speculative, or the product of bad work. *See* HAMES, *supra* note 87, at 2-3. But peer review is not perfect. *See infra* Part III.

126 *See supra* note 45. Thus, in a situation where the scope of the disclosure is greater than the scope of the claims, the *Milburn* rule prevents another from claiming the invention disclosed (but not claimed) by the first inventor.

127 There are at least five reasons why a patentee would disclose subject matter but not claim it. First, a patentee may intentionally disclose unclaimed material to create novelty problems for subsequent inventors. *See* Seymore, *Rethinking Novelty*, *supra* note 19, at 945-46 (discussing "defensive disclosure" tactics). Second, it could be an unintentional error. *See* Michael J. Meurer & Craig Allen Nard, *Invention, Refinement and Patent Claim Scope: A New Perspective on the Doctrine of Equivalents*, 93 GEO. L.J. 1947, 1951-52 (2005) (explaining that an applicant's ability to claim everything the applicant has enabled depends on the talent and effort of the inventor and patent prosecutor in identifying what has been enabled). Third, because the written description places an outer limit on claim scope, Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc., 166 F.3d 1190, 1196 (Fed. Cir. 1999), one way to avoid § 112(a) problems is to draft a disclosure that is broader than the claims. Fourth, the applicant could strategically craft narrow claims to avoid scrutiny by the Patent Office during prosecution and then, after issuance, rely on the broad disclosure to enlarge the scope of the claims in litigation. *See* Genentech, Inc. v. Wellcome Found. Ltd., 29 F.3d 1555, 1564 (Fed. Cir. 1994) (discussing the strategy). This tactic has been severely limited by the courts. *See* cases cited *supra* note 55. Fifth, an applicant may use continuation practice "to gain advantages over competitors by waiting to see what product the competitor will make, and then drafting patent claims specifically designed to cover that product." Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63, 65 (2004).

128 Engel Indus., Inc. v. Lockformer Co., 946 F.2d 1528, 1531 (Fed. Cir. 1991); *see also* MPEP, *supra* note 59, § 2164.08 ("All questions of enablement are evaluated against the claimed subject matter.").

129 *In re* Antor Media Corp., 689 F.3d 1282, 1288 (Fed. Cir. 2012) ("Unlike claimed disclosures in a patent, unclaimed disclosures are thus not examined by the PTO at all.").

prophetic in nature — which again raises doubts about enablement.[130] Second, the presumption of enablement is hard to justify for unclaimed subject matter.[131] Third, given that the inventor is generally a person of extraordinary skill[132] who knows more about the invention than the examiner,[133] no one actually believes that everything the inventor knows about it ends up in the patent document.[134] Taken together, these three points support my argument that patent documents disclosing unclaimed subject matter tend to be less technically robust sources of prior art (and thus, more suspect in terms of enablement) than manuscripts submitted to a peer-reviewed technical journal. This is why I contend that the *Milburn* principle of backdating a reference is more justifiable for a technical manuscript than for a patent document.

3. Implementation

Since I have argued that earlier-filed patent documents and peer-reviewed journal manuscripts should be treated the same way for prior art purposes, the most straightforward way to implement my proposal would be to amend § 102(a)(2) to incorporate the latter. Below I offer a possible revision of the statute (with the new or amended language emphasized):

> [A person shall be entitled to a patent unless] the claimed invention was described in a patent . . . , an application for patent published or deemed published . . . , *or a peer-reviewed journal manuscript* in which the patent, application, *or manuscript*, as the case may be, names another inventor and

130 *See supra* notes 122–23 and accompanying text.

131 I have argued that it is not. *See* Sean B. Seymore, *Reinvention*, 92 NOTRE DAME L. REV. 1031, 1058 (2017).

132 Patent law presumes that inventors have extraordinary skill. *See* Standard Oil Co. v. Am. Cyanamid Co., 774 F.2d 448, 454 (Fed. Cir. 1985).

133 Abbott Labs. v. Sandoz, Inc., 544 F.3d 1341, 1357 (Fed. Cir. 2008) (noting that "the patent practice includes recognition that the inventor usually knows more about the field than does the 'expert' patent examiner"); *see* Doug Lichtman & Mark A. Lemley, *Rethinking Patent Law's Presumption of Validity*, 60 STAN. L. REV. 45, 53 (2007) (explaining that examiners "have backgrounds roughly related to the technology at hand, but . . . are rarely experts on the precise details of the relevant invention").

134 *See* ADELMAN ET AL., *supra* note 69, at 579 (noting that applicants have a great incentive to withhold information "that might deleteriously impact their prospective patent rights"); Timothy R. Holbrook, *Patents, Presumptions, and Public Notice*, 86 IND. L.J. 779, 805, 818 (2011) (exploring the incentives for applicants to behave strategically and withhold certain information from the examiner, particularly in the absence of an adversarial check).

> was effectively filed *or submitted for publication* before the effective filing date of the claimed invention.[135]

Amending the current statute to include manuscript prior art also makes sense from a structural standpoint. First, the amendment would align with the way that the AIA handles information contained in an earlier-filed patent document asserted under § 102(a)(2). The AIA refers to this information as "disclosures"[136] — reiterating that *non-public* information qualifies as prior art under the statute.[137] Just as filing a patent application represents a non-public disclosure, so too would the submission of a manuscript for peer-review. The broader point is that "disclosure" in § 102(a)(2) does not require widespread dissemination or ubiquitous accessibility but something less — such as a move away from complete secrecy or an effort to extend the inventor's knowledge beyond a highly-protected sphere.[138]

Second, the AIA sets forth exceptions to the novelty rule of § 102(a)(2) that would sensibly apply to manuscript prior art. Specifically, § 102(b)(2) recites three circumstances under which a later-filing inventor, who claims what an earlier-filer discloses in a patent document, can remove that earlier-filed disclosure from the prior art.[139] An earlier-filed patent document will not serve as prior art when: (1) the subject matter in the earlier-filed patent document asserted as prior art was derived from the applicant — i.e., the disclosure in the asserted prior art reference originated with the inventor himself;[140] (2) the applicant publicly disclosed the subject matter in the earlier-filed patent document before it was filed;[141] and (3) the earlier-filed patent document is owned by the same entity that owns the applicant's invention.[142] The policy rationale for these

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[135] One might ask why the proposal does not seek to expand § 102(a)(2) to include *all* non-patent publications. The reason is enablement. As discussed in the main text, enablement is rarely an issue for manuscripts submitted for peer review because the norms of science require that they be technically robust. *See supra* text accompanying notes 124–25. Other types of publications like catalogs, sales brochures, and pamphlets do not require such a high disclosure standard. And so for them, applying the *Milburn* rule is less justifiable.

[136] 35 U.S.C. § 102(b)(2) (2012). The relevant language reads, "EXCEPTIONS. — DISCLOSURES APPEARING IN APPLICATIONS AND PATENTS. — A disclosure shall not be prior art to a claimed invention under subsection (a)(2) if . . . ." *Id.*

[137] Merges, *supra* note 68, at 1037.

[138] *Id.* at 1035-37.

[139] 35 U.S.C. § 102(b)(2).

[140] *Id.* § 102(b)(2)(A).

[141] *Id.* § 102(b)(2)(B).

[142] *Id.* § 102(b)(2)(C).

exceptions applies to all pipeline disclosures, including manuscript prior art. For example, if the inventor who submitted the peer-reviewed manuscript for publication derived the subject matter from the later-filer, the manuscript should not count as prior art against the later filer.[143] This approach reinforces my main point that from both a theoretical and pragmatic standpoint, all pipeline disclosures should be treated similarly.

III. RESPONDING TO POSSIBLE OBJECTIONS

A. The Technical Quality of Manuscript Prior Art

A basic assumption of my proposal is that manuscript prior art tends to be more enabling than patent documents.[144] This assumption "arises from the general expectation that a published experiment, measurement, or calculation contains information sufficient to allow a second investigator to repeat it and obtain results identical to those obtained by the initial experimenter (within the inherent error of the measurements involved)."[145] Thus, the research community expects that a scientist can readily replicate a result that is published in the scientific literature because what is reported should work as described.[146]

Yet scientists are realistic. They understand that peer review is not a stamp of authentication and may only provide a minimal assurance of technical quality.[147] For example, sometimes published articles are retracted due to the discovery of research misconduct or irreproducibility.[148] As with patent documents, nonenabled subject

[143] *See In re* Facius, 408 F.2d 1396, 1407 (C.C.P.A. 1969) (holding that if the applicant actually invented the subject matter upon the relevant disclosure in the prior art patent was based, "then the [prior art] patent may not be used as a reference against him"), *discussed in* Robert A. Armitage, *Understanding the America Invents Act and Its Implications for Patenting*, 40 AIPLA Q.J. 1, 72-73 (2012) (explaining that the policy of excluding subject matter disclosed in the earlier patent document that was derived from the work of the inventor from the prior art is merely a codification of existing law).

[144] *See supra* Section II.B.2.

[145] Robert G. Bergman, *Irreproducibility in the Scientific Literature: How Often Do Scientists Tell the Whole Truth and Nothing but the Truth?*, PERSP. ON PROFS., Jan. 1989, http://ethics.iit.edu/perspective/v8n2%20perspective.pdf.

[146] *See id.*

[147] Charles G. Jennings, *Quality and Value: The True Purpose of Peer Review*, NATURE (2006), http://www.nature.com/nature/peerreview/debate/nature05032.html.

[148] *See* Irene Hames, *Peer Review in a Rapidly Evolving Publishing Landscape*, *in* ACADEMIC AND PROFESSIONAL PUBLISHING 15, 23 (Robert Campbell et al. eds., 2012)

matter in such documents would not qualify as prior art.[149] Ultimately technical quality depends on many factors, including the scientist-author's commitment to conducting rigorous and meticulous research, scientific ethics,[150] and the prestige of the journal.[151]

While there is no guarantee that all peer-reviewed manuscripts will be of high technical quality, the *quantity* of disclosure is high. Unlike patent documents, the norms of science compel authors to describe experiments actually performed.[152] Peer-reviewed manuscripts, therefore, tend to be more technically robust — and more enabling — than the prophetic disclosures which are common in patent documents. This supports my argument that the *Milburn* rule is more justifiable for peer-reviewed manuscripts than for patent documents.[153]

B. Determining the Submission Date

I have argued that a peer-reviewed manuscript should qualify as § 102(a)(2) prior art because it, like a patent application, is a "pipeline" disclosure on the trajectory toward publication.[154] Just as a patent application gets a prior art effective date which coincides with the filing date, I propose that a manuscript get an effective date which coincides with its submission date. Thus, the effective date for both disclosures would match the date of entry into the disclosure pipeline.

This similar treatment raises a potential objection which relates to how the technical substance of a disclosure might change as it moves

(discussing the retraction of peer-reviewed publications).

149 *See In re* Donohue, 766 F.2d 531, 533 (Fed. Cir. 1985) (explaining that the disclosure of an unsuccessful attempt to make the invention was "strong evidence that the disclosure . . . was nonenabling"); Fromson v. Advance Offset Plate, Inc., 755 F.2d 1549, 1558 (Fed. Cir. 1985) (noting that a failed experiment reported in a third-party patent is irrelevant as a prior art reference).

150 *See* Bergman, *supra* note 145, at 2-3 (discussing scientific misconduct and the realization that "all scientists have expectations about how their experiments will turn out and therefore have a tendency to see what they want to see and ignore what goes against their preconceived ideas").

151 There is a well-accepted hierarchy: "At the apex . . . stand the most prestigious multidisciplinary journals; below them is a middle tier of good discipline-specific journals with varying degrees of selectivity and specialization; and propping up the base lies a large and heterogeneous collection of journals whose purviews are narrow, regional or merely unselective." Jennings, *supra* note 147 (citing Peter A. Lawrence, *The Politics of Publication*, 422 NATURE 259 (2003)).

152 *See supra* note 124 and accompanying text.

153 *See supra* Section II.B.2.b.

154 *See supra* Part II.A.

through the pipeline. For a patent application, the story is quite simple. The technical substance does *not* change over time because the so-called "new matter" doctrine severely restricts post-filing amendments to the disclosure.[155] If the applicant wants to add new matter to the original disclosure, that can be done in a new application which gets two filing dates — one for the original disclosure and another for the new matter.[156]

By contrast, a journal manuscript can change quite a bit over time.[157] Putting aside outright rejections, a peer reviewer can insist on major revisions that require new experiments or analyses.[158] This typically happens when the premise of the manuscript is good but the execution is poor.[159] The author is invited to revise and resubmit the manuscript.[160]

The important question is how to take revisions into account in determining a submission date for manuscripts. Since something cannot become prior art until it is publicly disclosed,[161] the response is that the submission date should be the date that the relevant technical information *actually enters the pipeline*. If a manuscript exits peer review substantively unchanged, the submission date is the original date of transmittal to the publisher.[162] But if the manuscript undergoes substantive changes during peer review, the submission date will be the date of transmittal of the revised manuscript to the publisher.[163]

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[155] *See* 35 U.S.C. § 132(a) (2012) ("No amendment shall introduce new matter into the disclosure of the invention."). The new matter prohibition "serve[s] to ensure that the patent applicant was in full possession of the claimed subject matter on the application filing date." TurboCare Div. of Demag Delaval Turbomachinery Corp. v. Gen. Elec. Co., 264 F.3d 1111, 1118 (Fed. Cir. 2001).

[156] This new application is referred to as a continuation-in-part application ("CIP"). *See* 37 C.F.R. § 1.53(b) (2016) (authorizing CIPs).

[157] Jennings, *supra* note 147.

[158] *See id.*; *see also* sources cited *supra* notes 85 and 87.

[159] PHILIPPA J. BENSON & SUSAN C. SILVER, WHAT EDITORS WANT: AN AUTHOR'S GUIDE TO SCIENTIFIC JOURNAL PUBLISHING 117 (2013).

[160] *See id.* For an example of a specific policy, see *Peer-Review Policies*, NATURE.COM, http://www.nature.com/srep/journal-policies/peer-review (last visited June 28, 2015).

[161] *See supra* note 23 and accompanying text.

[162] *See supra* notes 24, 36 and accompanying text.

[163] *See supra* note 24 and accompanying text. Importantly for prior art purposes, it appears that many journals give a "manuscript revised" date on published manuscripts that were revised and resubmitted. For examples of revised manuscripts, see Rafael Auras et al., *An Overview of Polyactides as Packaging Materials*, 4 MACROMOLECULAR BIOSCIENCE 835, 835 (2004) (received April 8, 2004; revised June 18, 2004; accepted June 28, 2004); Lynda F. Bonewald, *The Amazing Osteocyte*, 26 J. OF BONE AND MINERAL RES. 229, 229 (2011) (received September 11, 2010; revised November 10,

Using this date makes sense because "the revised version of the paper will be counted as a new submission and will probably have to go through the entire peer review process again."[164]

C. Public Accessibility and Administrative Burdens

Adopting the proposal to expand § 102(a)(2) to include manuscript prior art could render *a lot* of inventions unpatentable — or issued patents invalid, as the case may be. The reason why the present § 102(a)(2) and its predecessor § 102(e) are so effective is because patent documents are easy to find. Indeed, patent examiners are much more likely to find and use issued patents and published patent applications as prior art than non-patent sources.[165] This makes sense because examiners are familiar with patent documents and have easy access to them.[166] And given examiner incentives and time limitations,[167] it is quite possible that examiners will overlook non-patent prior art.[168] This becomes a bigger challenge if a manuscript is published in an obscure journal.[169]

But, just because manuscripts might be harder to find than patent documents does not mean that the former should not qualify as

2010; accepted December 1, 2010; published online December 16, 2010).

[164] BENSON & SILVER, *supra* note 159, at 117. It stands to reason that unchanged information in a revised manuscript should get the date of transmittal of the original manuscript to the publisher as the submission date for prior art purposes.

[165] *See* John R. Allison & Mark A. Lemley, *The Growing Complexity of the United States Patent System*, 82 B.U. L. REV. 77, 101-02 (2002) (presenting empirical findings on references to prior art); Bhaven N. Sampat, Determinants of Patent Quality: An Empirical Analysis 3 (2005) (unpublished manuscript), http://www.immagic.com/eLibrary/ARCHIVES/GENERAL/COLUMBIA/C050902S.pdf (finding that examiners are less likely to find non-patent prior art).

[166] Allison & Lemley, *supra* note 165, at 102 ("The predominance of citations to U.S. patents may . . . reflect the limitations of the PTO systems for searching: the PTO is much more likely to find documents that it itself has generated.").

[167] For a discussion of examiner incentives, see Mark A. Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes*, 94 REV. ECON. & STAT. 817, 818 (2012). The amount of time the Patent Office allots for an examiner to dispose of a case depends on factors like patent seniority and the technology involved. *See* Michael D. Frakes & Melissa F. Wasserman, *Does Agency Funding Affect Decisionmaking?: An Empirical Assessment of the PTO's Granting Patterns*, 66 VAND. L. REV. 67 app. A at 135-36 tbl.A1 (2013) (tabulating examiner hours allotted for various technology classes).

[168] Michael Risch, *The Failure of Public Notice in Patent Prosecution*, 21 HARV. J.L. & TECH. 179, 196 (2007); *see also* John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305, 318-19 (explaining why non-patent literature is often more difficult to find).

[169] *See* DAVID B. RESNIK, THE ETHICS OF SCIENCE: AN INTRODUCTION 103 (1998).

§ 102(a)(2) prior art.[170] Expanding the universe of prior art would improve patent quality[171] — a stated goal of the AIA.[172] The challenge is to fix the Patent Office's infrastructure to get relevant technical information into the examiner's hands.[173]

Given the current realities of patent examination, it may be that the proposed § 102(a)(2) would do most of its work post-issuance.[174] This could be in infringement suits (as an invalidity defense) or in one of the post-issuance, non-litigation-based mechanisms created by the AIA to deal with questionable patents.[175] Either way, the patent challenger would have the time and resources to readily find the manuscript prior art.[176]

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[170] The Hon. Donald W. Banner, former U.S. Commissioner of Patents and Trademarks, once opined on why hard-to-find information is fully prior art (and objected to the adjective "secret"):

> You might not be able to find it very easily, but . . . it is there. It is difficult to find, yes, that's often very true. Much more difficult to find than, for example, an issued patent. But it is, nonetheless, there. Furthermore, if we say things aren't really prior art unless they're easy to find, things aren't really prior art unless they're in the [drawer] of the examiner, things aren't really prior art if it takes a lot of money for a lawyer to uncover it someplace, what are we going to do about the issue of a publication in the Beijing High School newspaper? That's prior art. There isn't the slightest question about that, and yet I suggest to you it's a very expensive and difficult thing to find.

Secret Prior Art, 32 IDEA 7, 27 (1991) (transcript of the Third Patent System Major Problems Conference, held on April 27, 1991).

[171] *See* Christopher A. Cotropia, *Modernizing Patent Law's Inequitable Conduct Doctrine*, 24 BERKELEY TECH. L.J. 723, 748 (2009) ("The assurance of a good patent quality is all about information . . . .").

[172] *See infra* Part IV.A.

[173] FED. TRADE COMM'N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY ch. 1, at 19 (2003) [hereinafter FTC REPORT] (arguing that the search for prior art is key to a quality patent and advocating for more resources to improve examination procedures).

[174] It is worth noting that various types of prior art, such as public uses, sales, offers for sale, and secret prior invention often come to light after patent issuance. *See, e.g.*, 2 IRAH H. DONNER, PATENT PROSECUTION: LAW, PRACTICE, AND PROCEDURE 2323 (9th ed. 2015) ("A section 102(g) rejection is rare during prosecution, since such a rejection involves intimate knowledge not only of the development of the patent applicant's invention but also of the prior art discovery.").

[175] Under the AIA, the available mechanisms include inter parties review ("IPR"), 35 U.S.C. §§ 311–319 (2012), and post-grant review ("PGR"), *id.* §§ 321–329, trials conducted by the Patent Trial and Appeal Board. In both proceedings the petitioner need only prove patent invalidity by a preponderance of evidence rather than the (higher) clear and convincing evidence standard applied in litigation. *Id.* §§ 316(e), 326(e).

[176] *See Secret Prior Art*, *supra* note 170, at 37 (remarks of the Hon. Donald W. Banner

IV. POLICY CONSIDERATIONS

The basic rationale for treating manuscript prior art the same way as § 102(a)(2) prior art is that both represent an early disclosure of knowledge on a trajectory toward public disclosure.[177] Applying the *Milburn* principle in each instance prevents the public from granting another inventor a patent monopoly for something that will inevitably enter the public domain.[178] Below I explain how extending *Milburn* to include manuscript prior art aligns with broad policy goals of the patent system to improve patent quality and serve the public interest.

A. Improving Patent Quality

One policy goal of the AIA is to improve patent quality.[179] To achieve this goal, the AIA overhauls § 102 to change what qualifies as prior art. Three changes are worth noting. First, under pre-AIA law, an offer for sale, sale, or public use of the claimed invention in a foreign country could only serve as prior art if the activity occurred in the United States.[180] Under the AIA, a prior offer for sale, sale, or public use anywhere in the world now qualifies as prior art.[181] Second, under the AIA, U.S. patents and published patent applications that originate in foreign jurisdictions now qualify as prior art based on when they were originally filed in those foreign jurisdictions, rather than when they were ultimately filed in the United States.[182] Third, the new statute now bars a patent if "the claimed invention was . . . otherwise available to the public."[183] How to interpret this new clause has generated a vigorous debate. One view is that the clause creates a new

explaining situations where an interested party could find § 102(g) prior art quite easily; yet an examiner could not because examiners lack the resources for doing so).

177 *See* discussion *supra* Part II.A.

178 *See* RONALD A. CASS & KEITH N. HYLTON, LAWS OF CREATION: PROPERTY RIGHTS IN THE WORLD OF IDEAS 64 (2013); FTC REPORT, *supra* note 173, ch. 6, at 4; EDWARD C. WALTERSCHEID, THE NATURE OF THE INTELLECTUAL PROPERTY CLAUSE: A STUDY IN HISTORICAL PERSPECTIVE 143 (2002); Rebecca S. Eisenberg, *Analyze This: A Law and Economics Agenda for the Patent System*, 53 VAND. L. REV. 2081, 2088 (2000).

179 *See* H.R. REP. NO. 112-98, pt. 1, at 39-40 (2011).

180 *See* 35 U.S.C. § 102(b) (2006) (pre-AIA).

181 *See id.* § 102(a)(1) (2012).

182 *Compare In re* Hilmer, 359 F.2d 859, 879 (C.C.P.A. 1966) (limiting the effective filing date for § 102(e) prior art to the date of actual U.S. filing), *with* 35 U.S.C. § 102(d) (2012) (overruling *Hilmer* by providing that a published application or patent is "effectively filed" for the purposes of § 102(a)(2) on the date of actual filing in the U.S. or the date of foreign filing).

183 35 U.S.C. § 102(a)(1) (2012).

category of prior art to cover public disclosures that do not fit within existing prior art categories,[184] such as an oral presentation at a technical meeting.[185] The alternative view is that all prior art must now be "available to the public," thereby eliminating secret commercial activities by the patentee as prior art.[186] The Federal Circuit recently settled the debate with respect to on-sale bar provision by concluding that under the AIA, the public sale of an invention qualifies as prior art even if the details of the invention are not publicly disclosed.[187]

Although complaints about patent quality led Congress to enact the AIA,[188] criticisms of questionable patents are not new.[189] Patent quality

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[184] MERGES & DUFFY, *supra* note 62, at 387; Mark A. Lemley, *Does "Public Use" Mean the Same Thing It Did Last Year?*, 93 TEX. L. REV. 1119, 1125 (2015).

[185] MERGES & DUFFY, *supra* note 62, at 387; Paul Morgan, *The Ambiguity in Section 102(a)(1) of the Leahy-Smith America Invents Act*, 2011 PATENTLY-O PAT. L.J. 29, 30; Joshua D. Sarnoff, *Derivation and Prior Art Problems with the New Patent Act*, 2011 PATENTLY-O PAT. L.J. 12, 25-27.

[186] Armitage, *supra* note 143, at 54 (arguing that the AIA repeals the forfeiture doctrine articulated in *Metallizing Eng'g Co. v. Kenyon Bearing & Auto Parts Co.*, 153 F.2d 516, 519-20 (2d Cir. 1946)). This interpretation would allow inventors to practice their inventions as trade secrets indefinitely before obtaining a patent unless and until someone else independently invents and discloses it. Morgan, *supra* note 185, at 30-31.

[187] Helsinn Healthcare S.A. v. Teva Pharms. USA, Inc., No. 16-1787, 2017 WL 1541518, at *8-11(Fed. Cir. May 1, 2017). As to the status of public uses, secret sales (or offers to sell), and secret commercialization activity post-AIA, the court expressly refused "to decide [the] case more broadly than necessary." *Id.* at *9.

[188] *See* H.R. REP. NO. 112-98, pt. 1, at 39-40 (2011); 157 CONG. REC. S1, 360-02 (daily ed. Mar. 8, 2011) (statement of Sen. Leahy) ("The America Invents Act . . . will establish a more efficient and streamlined patent system that will improve patent quality and limit unnecessary and counterproductive litigation costs, while making sure no party's access to court is denied."); David Kappos, *Using a Data-Driven Approach for Quality Improvements*, USPTO (Jan. 22, 2013, 2:08 PM), http://www.uspto.gov/blog/director/entry/using_a_data_driven_approach ("Improving patent quality was a key element in building bipartisan support for the America Invents Act . . . ."). Many complaints focused on the Patent Office. *See, e.g.*, ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS 74 (2004) (describing what can happen when the Patent Office "falls down on the job"); Mark A. Lemley & Bhaven Sampat, *Is the Patent Office a Rubber Stamp?*, 58 EMORY L.J. 181, 181-82 (2008) (exploring criticisms).

[189] *See, e.g.*, S. COMM. ON THE JUDICIARY, 90TH CONG., TO PROMOTE THE PROGRESS OF USEFUL ARTS: REPORT OF THE PRESIDENT'S COMMISSION ON THE PATENT SYSTEM, S. DOC. NO. 5, at 3, 32-33 (1st Sess. 1967) (concluding that raising the quality of issued patents should be a major objective of the patent system); P.J. Federico, *Adjudicated Patents, 1948–54*, 38 J. PAT. OFF. SOC'Y 233, 236 tbl.2, 237 tbl.4 (1956) (collecting validity data for litigated cases from 1948–1954 and finding that, excluding patents counted more than once, appellate courts invalidated patents 62.7% of the time and

can be defined as "the capacity of a granted patent to meet (or exceed) the statutory standards of patentability,"[190] or, more simply, "the likelihood that a court, applying correct standards of patentability and having knowledge of all relevant information, would find the patent valid if it were contested."[191] Aside from being technically invalid,[192] low-quality patents impose costs on the legal system, competitors, would-be inventors, and society.[193]

Amending § 102(a)(2) to include manuscript prior art would do much to improve patent quality. Extending the *Milburn* principle to include manuscripts would greatly expand the universe of prior art. And given the large number of technical journals, backdating a manuscript's prior art effective date to its submission date could render *a lot* of inventions unpatentable — or issued patents invalid, as the case may be.[194] Thus, amending the statute would make patents harder to obtain and issued patents more vulnerable to attack.

district courts invalidated patents 53.5% of the time); Bert Russell, *The Improvement of Our Patent System*, 15 J. PAT. OFF. SOC'Y 666, 677 (1933) (quoting an unprinted report to the Secretary of Commerce on the needs of the Patent Office indicating that improved quality is "fundamental and necessary" because the work of the Patent Office "is not sufficiently accurate and authoritative").

190 R. Polk Wagner, *Understanding Patent-Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2138 (2009); *cf.* Christi J. Guerrini, *Defining Patent Quality*, 82 FORDHAM L. REV. 3091, 3092-93 (2014) (defining "low-quality" or "bad" patents as those which "carve out of the public domain and deter others from practicing inventions that are in some way undeserving of patent protection").

191 Thomas E. Popovich, *Patent Quality: An Analysis of Proposed Court, Legislative, and PTO — Administrative Reform — Reexamination Resurrected (Part I)*, 61 J. PAT. OFF. SOC'Y 248, 248 n.2 (1979).

192 *Cf.* FTC REPORT, *supra* note 173, Executive Summary, at 5 ("A poor quality or questionable patent is one that is likely invalid or contains claims that are likely overly broad.").

193 *See, e.g.*, Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1515 (2001) (noting that bad patents impose costs on licensees, potential competitors, and society); Christopher R. Leslie, *The Anticompetitive Effects of Unenforced Invalid Patents*, 91 MINN. L. REV. 101, 113-39 (2006) (making similar arguments); John R. Thomas, *The Responsibility of the Rulemaker: Comparative Approaches to Patent Administration Reform*, 17 BERKELEY TECH. L.J. 727, 731 (2002) (explaining that legal actors often must revisit the Patent Office's work to assess patent validity).

194 As a general matter, patent applicants aggressively seek to limit the universe of prior art that can be asserted against them during examination. The easiest way to accomplish this is to show that a particular reference cannot serve as prior art because of its publication date. For example, an applicant facing a lack-of-novelty rejection based on a journal article published the day after the applicant's filing date can simply identify the date discrepancy and compel the Patent Office to remove the reference and withdraw the rejection, even if the reference discloses the identical invention.

B. Serving the Public Interest

There is a strong public policy rationale for expanding the universe of prior art as proposed in this Essay. Recall that manuscripts submitted for publication are in the disclosure pipeline, meaning the public will eventually (and inevitably) get what is disclosed therein.[195] Society need not bear the cost of a patent monopoly to induce invention or the disclosure of knowledge that it will get without the patent.[196] If anything, the public will be burdened by a patent covering knowledge *that it has already received (or will receive) for free* from the earlier inventor, thereby imposing a cost on the public without a countervailing benefit.[197] This is what the novelty requirement is all about.[198] Yet this happens all the time since the *Milburn* rule only applies to earlier-filed patent documents.

Implementing my proposal would solve this problem. Since submission of the manuscript gives the public access to knowledge, the prospect of a patent to a later-filer is unnecessary for inducement and granting one would actually harm the public. This, of course, aligns with the basic theoretical rationale for the novelty requirement.[199]

Nonetheless, applicants have an incentive to ensure that the examiner considers all potentially patent-defeating prior art. *See* Microsoft Corp. v. i4i Ltd. P'ship, 564 U.S. 91, 111 (2011) ("[I]f the [Patent Office] did not have all material facts before it, its considered judgment may lose significant force" and "the challenger's burden to persuade the jury of its invalidity defense by clear and convincing evidence may be easier to sustain.").

195 *See supra* Part II.A.

196 *See* FTC REPORT, *supra* note 173, ch. 6, at 4 ("The ultimate point of granting a patent is . . . to create incentives for actions — invention, disclosure, and commercial development — that will further the public interest and thus benefit consumers over time."); WALTERSCHEID, *supra* note 178, at 143 (explaining that the quid pro quo rationale for patents is to induce the disclosure of information that the public might not otherwise get).

197 CASS & HYLTON, *supra* note 178, at 64; Eisenberg, *supra* note 178, at 2088 ("Granting patents on technologies that are not new would impose the social costs of monopolies without the countervailing benefits of promoting development and introduction of welfare-enhancing inventions.").

198 "Without something like the novelty requirement, society would pay the price of patents without any corresponding benefits in return — after all, the public already knew about the claimed invention, so there is no longer any need to provide an incentive for someone to invent it." Andres Sawicki, *Better Mistakes in Patent Law*, 39 FLA. ST. U. L. REV. 735, 743 (2012) (citing 1 ROBINSON, *supra* note 2, at 305).

199 *See* CASS & HYLTON, *supra* note 178, at 64; *see also* Robert P. Merges, *Uncertainty and the Standard of Patentability*, 7 HIGH TECH. L.J. 1, 12-13 (1992) ("The logic behind [the novelty requirement] is fairly straightforward [because if] information is already in the public domain when the 'inventor' seeks to patent it[,]

CONCLUSION

Timing matters in patent law. Whether an invention can satisfy novelty depends on the documents and activities that can be asserted as prior art. The *Milburn* rule stretches the traditional concept of prior art because it allows an earlier-filed patent document to defeat novelty before the disclosure becomes accessible to the public. Backdating is justified because the first inventor did all that could be done to promptly disclose the invention to the public; thus administrative delays should be ignored. But a manuscript submitted for publication in a peer-reviewed technical journal is also on a trajectory toward public disclosure. Yet it is hard to understand why patent law treats them differently for prior art purposes. Not only should they have the same prior art effect, but I have shown that the *Milburn* principle is more justifiable for manuscripts because the norms of peer review virtually ensure that the disclosure will be enabling. My claim raises interesting theoretical and policy questions about novelty and the meaning of prior art.

society has no need to grant a patent to get this information.").