

The Fruit of the Poisonous Tree in IP Law*

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ABSTRACT: If a police officer searches my home illegally and finds evidence of a crime there, the criminal law suppresses not only that evidence, but evidence derived from the search that was not itself found illegally. This doctrine is known as the “fruit of the poisonous tree.” The animating principle of the fruit of the poisonous tree doctrine is but-for causation: If you had not violated the law, you wouldn’t have found the evidence, and so you wouldn’t have followed whatever investigative path was triggered by the finding of that evidence. The newly discovered evidence—the fruit—is tainted by the poison of the illegal search.

Intellectual property (“IP”) regimes face this issue when defendants infringe an IP right in the course of making a product that does not itself infringe that right. IP law is all over the map in dealing with such cases. Some IP regimes, like trade secret law, apply the fruit of the poisonous tree logic, allowing the plaintiff to recover not only for the profits the defendant made from secrets she actually stole and used but also for the profits of any product that resulted from the use of those secrets. Copyright law, by contrast, does not permit a plaintiff either to obtain an injunction or to recover damages against non-infringing final products. Patent law is somewhere in between.

In this Essay, I offer a cohesive way to think about the fruit of the poisonous tree in IP law. Whether IP remedies should extend to tainted but non-infringing products should be a function of the mental state of the infringer, the likelihood that infringement will be detected, and the contribution made by the final, non-infringing product. Balancing those three factors won’t necessarily lead all IP regimes to treat the fruit of the poisonous tree in the same way. But it does both explain and suggest some needed reforms to the current legal rules.

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I. INTRODUCTION

If a police officer searches my home illegally and finds evidence of a crime, courts refuse to admit not only that evidence, but evidence found legally if it was ultimately derived from the search. This doctrine is known as the “fruit of the poisonous tree.”¹ The animating principle of the fruit of the poisonous tree doctrine is causation: If you had not violated the law, you wouldn’t have found the evidence, and you wouldn’t have followed whatever investigative path that was triggered by finding that evidence. The newly discovered evidence—the fruit—is tainted by the poison of the illegal search.

Civil law also concerns itself with chains of causation, both in determining liability and in ordering relief. But it does not typically apply the logic of the fruit of the poisonous tree to chase down every consequence of a wrong. Tort law, for example, requires proof of both but-for and proximate causation.² In tort cases, plaintiffs can recover for some (but not all)

1. See *Segura v. United States*, 468 U.S. 796, 802 (1984); *United States v. Ceccolini*, 435 U.S. 268, 275 (1978). Courts applying the fruit of the poisonous tree doctrine in criminal procedure have struggled with some of the same questions of the extent of causation that I discuss in this paper. See generally, e.g., *Herring v. United States*, 555 U.S. 135 (2009); Albert W. Alschuler, *The Exclusionary Rule and Causation: Hudson v. Michigan and Its Ancestors*, 93 IOWA L. REV. 1741 (2008).

2. See *Palsgraf v. Long Island R.R. Co.*, 162 N.E. 99, 102–03 (N.Y. 1928).

unforeseeable consequences.³ Similarly, while remedies law generally tries to return plaintiffs to their rightful position—compensating them for injuries and giving them what they could have expected to receive absent the wrong⁴—it also limits both who can obtain compensation and the sort of thing for which they can be compensated.⁵ Civil law also has rules that aim to disentangle compensable from uncompensable injuries. Antitrust law, for instance, has a “disaggregation” requirement. For a plaintiff to prove that it was injured “by reason of” the antitrust laws,⁶ the plaintiff must be able to separate the harm attributable to the violation from any injury it suffered as a result of legal competitive conduct.⁷

Intellectual property (“IP”) regimes particularly struggle with causation issues when defendants infringe an IP right in the course of making a product that does not itself infringe. Suppose, for instance, that I copy your song onto my laptop in order to make my own song that samples yours. Depending on

3. In *Palsgraf*, for instance, a chain of accidents that led to an injury across the train platform was held to be unforeseeable and hence uncompensable. By contrast, where the contact with the plaintiff is itself foreseeable, courts will generally hold the defendant liable for any physical injury to that plaintiff, even if the extent of that injury was itself unforeseeable. This is known as the “eggshell skull” rule. See generally *Stoleson v. United States*, 708 F.2d 1217, 1221 (7th Cir. 1983) (stating defendants must take their plaintiffs as they find them); WILLIAM L. PROSSER, *HANDBOOK OF THE LAW OF TORTS* 261 (4th ed. 1971).

4. See generally DANIEL B. DOBBS, *LAW OF REMEDIES: DAMAGES—EQUITY—RESTITUTION* (2d ed. 1993); DOUGLAS LAYCOCK, *MODERN AMERICAN REMEDIES* (4th ed. 2012).

5. See, e.g., *Petition of Kinsman Transit Co.*, 388 F.2d 821, 825 (2d Cir. 1968) (“[T]he circumlocution whether posed in terms of ‘foreseeability,’ ‘duty,’ ‘proximate cause,’ ‘remoteness,’ etc. seems unavoidable.” (citations omitted)); *Pruitt v. Allied Chem. Corp.*, 523 F. Supp. 975 (E.D. Va. 1981) (finding that commercial fishermen could be compensated for losses to the value of their catch resulting from pollution of the Chesapeake Bay, but that restaurants and stores that purchased fish from them could not). Thus, a plaintiff who suffers a heart attack from stress caused by a breach of contract or patent infringement cannot recover, even if she can prove the infringement was a but-for cause of the heart attack. *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1546 (Fed. Cir. 1995) (en banc) (“[J]udicial relief cannot redress every conceivable harm that can be traced to an alleged wrongdoing. . . . For example, remote consequences, such as a heart attack of the inventor or loss in value of shares of common stock of a patentee corporation caused indirectly by infringement are not compensable. Thus, along with establishing that a particular injury suffered by a patentee is a ‘but for’ consequence of infringement, there may also be a background question whether the asserted injury is of the type for which the patentee may be compensated.”). The court in *Pruitt*, for instance, was explicit that it was cutting off the chain of causation not because there was no but-for causation or even because injury was unforeseeable but because of

a perceived need to limit liability, without any articulable reason for excluding any particular set of plaintiffs. . . . The Court concludes that plaintiffs who purchased and marketed seafood from commercial fisherman suffered damages that are not legally cognizable, because insufficiently direct. This does not mean that the Court finds that defendant’s alleged acts were not the cause of plaintiffs’ losses, or that plaintiffs’ losses were in any sense unforeseeable.

Pruitt, 523 F. Supp. at 980 (footnote omitted).

6. Clayton Act § 4(a), 15 U.S.C. § 15(a) (2012).

7. *Comcast Corp. v. Behrend*, 133 S. Ct. 1426, 1434 (2013).

how much I use, the final song may not infringe your copyright,⁸ but intermediate versions might, as might the original copy. Or suppose I use a patented microscope without permission to make a scientific discovery that turns into a new drug. The drug doesn't infringe the microscope patent, but the act of research might infringe. Or I might steal your product to figure out how it works, not so that I can copy it but so I can make one that works a different way. My final product doesn't incorporate your secret, but I used my ill-gotten knowledge of your product to get there.

IP law is all over the map in dealing with such cases. Some IP regimes, like trade secret law, apply fruit of the poisonous tree logic, allowing the plaintiff to recover not only for the profits the defendant made from secrets she actually stole and used, but also for the profits of any product that resulted from the use of those secrets, even if the product does not itself incorporate the secret. Trade secret law will also grant a "head-start" injunction against selling non-infringing products for a period of time. In contrast, copyright law does not permit a plaintiff either to obtain an injunction or to recover damages against non-infringing final products. Patent law is somewhere in between, refusing to enjoin non-infringing products but leaving the door open to reach-through royalty claims.

It is not clear that these differences reflect any considered judgment about when IP law should prevent or punish the making and selling of non-infringing products tainted by infringement during the creation process. In this Essay, I offer a cohesive way to think about the fruit of the poisonous tree in IP law. Whether IP remedies should extend to tainted but non-infringing products should be a function of the mental state of the infringer, the ease of enforcing the IP right against the actually infringing products, and the contribution made by the final, non-infringing product. Balancing these three factors won't necessarily lead all IP regimes to treat the fruit of the poisonous tree in the same way, but it does help explain current legal rules and also suggest some needed reforms.

In Part II, I discuss the rationale behind but-for causation theories and their limits in the law. I also explore how each IP doctrine treats the fruit of the poisonous tree differently. In Part III, I suggest a single framework for evaluating poisonous-tree claims and apply that framework to offer proposed reforms to existing law.

8. Compare *Bridgeport Music, Inc. v. Dimension Films*, 410 F.3d 792, 798 (6th Cir. 2005) (using a sample from a song, no matter how brief and inconsequential, is infringing), with *Newton v. Diamond*, 388 F.3d 1189, 1190 (9th Cir. 2004) (copying of three notes from prior song was de minimis and so not infringing).

II. WHEN DO NON-INFRINGEMENT PRODUCTS INFRINGE?

A. THE LIMITS OF BUT-FOR CAUSATION

Many legal doctrines struggle with the limits of causation. The world is a complex and interconnected place. We can trace the echoes of actions through an almost endless chain of likely, or at least possible, circumstances. When you drove your car into mine, you damaged it, causing me to pay towing and repair costs. This causation chain is simple enough and is something the law will surely compensate me for. But you also caused me to miss work for several days, so I didn't get paid. Perhaps the law will compensate me for that too, if it views the loss as sufficiently foreseeable. But, suppose that while I was without a car, I lost focus on a long-term work project, and the bid I submitted wasn't as good as it could have been. My employer lost out on the contract as a result, and the business's profits were less than they otherwise would have been. That meant, in turn, that the stock price declined, and the retirees who held that stock had less money than they otherwise would have. The stress brought on by money woes even caused one of those retirees to have a heart attack. It is at least possible—though progressively less likely—that each of those statements is true as a matter of causal inference. None of those things would have happened were it not for the car accident. But the law will not allow me or those around me to recover for all of those losses, even if we can prove they happened. Rather, the doctrine of proximate cause seeks to restrict plaintiffs to remedies that were both caused by the defendant's actions in a but-for sense and were also sufficiently direct, and therefore foreseeable.⁹ The result is that the law does not—and likely cannot—fully undo the harm caused by various infractions of the law. Instead, it tries to balance the effort to redress injury with the practical limits of tracing the ripples of causation as far as they might go.

B. INFRINGEMENT AND CAUSATION IN IP¹⁰

IP laws prevent infringement on the legal rights of an IP owner. Each IP regime defines infringement differently, but all require that the defendant's conduct or product be sufficiently similar to the plaintiff's. Some regimes also require a wrongful act, like copying from the plaintiff, but the basic definition of infringement requires a certain congruence between the defendant's conduct and the plaintiff's protected legal right. In normal IP cases, the defendant's infringing product is sold in competition with the plaintiff's or in circumstances that might preempt a market the plaintiff would otherwise have

9. See *Staelens v. Dobert*, 318 F.3d 77, 79 (1st Cir. 2003) (Without probable cause, "liability would extend endlessly, one harm leading inevitably to others."); RESTATEMENT (THIRD) OF TORTS: PHYSICAL & EMOTIONAL HARM § 29 (AM. LAW INST. 2010); W. PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS 280–81 (5th ed. 1984).

10. For a discussion of a different causation issue in IP—what makes someone an author—see generally Shyamkrishna Balganesh, *Causing Copyright*, 117 COLUM. L. REV. 1 (2017).

been able to exploit. The act of infringement gives rise to the harm—whether it is lost sales or licensing revenue to the IP owner—and IP remedies are designed to prevent or undo that harm. Each IP regime confronts situations in which the defendant makes unauthorized use of the plaintiff’s work in the course of producing something else that does not itself infringe the plaintiff’s IP right. Curiously, each IP regime approaches the issue in a somewhat different way.

1. Trade Secrets

Trade secret law is the most expansive in applying the fruit of the poisonous tree doctrine. When the defendant acquires a plaintiff’s secret through improper means, or uses or discloses it in violation of a duty to keep it confidential, trade secret law will find misappropriation even if the defendant’s final product differs in whole or in part from the plaintiff’s. Thus, in *Smith v. Dravo Corp.*, the defendant was held liable for using the plaintiff’s secrets, obtained during negotiations to buy the plaintiff’s company, to instead decide to enter the market on its own.¹¹ Notably, the defendant’s product was not simply a copy of the plaintiff’s. While the court found the two “strikingly similar[]” in some respects,¹² it also based liability on the fact that the defendant used its access to plaintiff’s confidential patent applications to change its product to avoid infringement.¹³ In other words, the act of misappropriation was, in part, not to copy the plaintiff’s secret design, but to use knowledge of the plaintiff’s secret to deliberately *not* copy that design.¹⁴ Nonetheless, the court held that act to be misappropriation because it was a use of the plaintiff’s secret that gave the defendant a commercial advantage it would not otherwise have had.¹⁵

Nor is *Smith* an outlier in this respect. In *Mangren Research & Development Corp. v. National Chemical Co.*, the court defined improper “use” broadly, stating that

“the user of another’s trade secret is liable even if he uses it with modifications or improvements upon it effected by his own efforts, so long as the substance of the process used by the actor is derived from the other’s secret.” . . . [I]f trade secret law were not flexible enough to encompass modified or even new products that are substantially derived from the trade secret of another, the protections that law provides would be hollow indeed.¹⁶

11. See generally *Smith v. Dravo Corp.*, 203 F.2d 369 (7th Cir. 1953).

12. *Id.* at 377.

13. *Id.*

14. *Id.* at 372.

15. *Id.* at 377.

16. *Mangren Research & Dev. Corp. v. Nat’l Chem. Co.*, 87 F.3d 937, 944 (7th Cir. 1996) (quoting *In re Innovative Constr. Sys., Inc.*, 793 F.2d 875, 887 (7th Cir. 1986)). Thus, it is not

In *Texas Tanks, Inc. v. Owens–Corning Fiberglas Corp.*, the Fifth Circuit held that any improper “exercise of control and domination” over a secret constituted a commercial use of that secret.¹⁷ It rejected the defendant’s argument that it could not be liable for taking a secret unless the secret was actually incorporated in a commercial product.¹⁸ The court noted that Owens–Corning’s awareness of the secret would likely influence the development of its own competing product, and that this was enough to demonstrate improper “use” of the secret.¹⁹ In *Collelo v. Geographic Services, Inc.*, the Virginia Supreme Court held that a party could misappropriate trade secrets even though it did not compete with the plaintiff, so long as the plaintiff could show injury.²⁰ By contrast, California courts have held that a trade secret in computer source code is not misappropriated by the mere use of publicly disclosed object code produced using that source code, because using the object code is neither use nor disclosure of the secret itself.²¹ That is a limitation on a fruit of the poisonous tree theory. Because the object code is not itself a secret, simply using it isn’t appropriation of a secret at all. By contrast, using the secret source code to produce new object code would likely constitute misappropriation even though the new object code is itself non-infringing. In the latter case, the new object code is the fruit of the poisonous tree.

Indeed, trade secret law protects “negative know-how”—the discovery that a particular research approach *doesn’t* work.²² Knowing what pitfalls to avoid can certainly have “independent economic, value actual or potential”—the standard for a trade secret.²³ It can make it quicker to find the right path and develop a product that works. But by definition, someone who learns that negative information through improper means and uses it in her business is not incorporating the secret in her products. Quite the contrary. The

enough to design around the plaintiff’s product if the secret is used to make the design-around. Cf. *Contour Design, Inc. v. Chance Mold Steel Co.*, 693 F.3d 102, 109–12 (1st Cir. 2012) (reversing an injunction against design-around, but only because the court found that the defendant did not employ plaintiff’s secrets in making it).

17. *Tex. Tanks, Inc. v. Owens–Corning Fiberglas Corp.*, 99 F.3d 734, 739 (5th Cir. 1996) (quoting *Garth v. Staktek Corp.*, 876 S.W.2d 545, 548 (Tex. App. 1994)), *withdrawn*, 99 F.3d 740 (5th Cir. 1997).

18. *Id.* at 738–39.

19. *Id.*

20. *Collelo v. Geographic Servs., Inc.*, 727 S.E.2d 55, 61–62 (Va. 2012); *see also* *Hallmark Cards, Inc. v. Monitor Clipper Partners*, 758 F.3d 1051, 1058 (8th Cir. 2014) (holding that the plaintiff whose secret was misappropriated by one party that sold it to another, which used it, could recover separately against both parties because the downstream use was an independent injury caused by the misappropriation).

21. *Silvaco Data Sys. v. Intel Corp.*, 109 Cal. Rptr. 3d 27, 39–40 (Cal. Ct. App. 2010), *overruled on other grounds by* *Kwikset Corp. v. Superior Court*, 246 P.3d 877 (Cal. 2011).

22. *See, e.g.*, JAMES POOLEY, TRADE SECRETS § 4.02[3] (1997).

23. UNIFORM TRADE SECRETS ACT § 1 (UNIF. LAW COMM’N 1979).

products themselves are not misappropriating the secret, but they are the fruit of the poisonous tree—the improper knowledge of what blind alleys to avoid.

Trade secret law also applies the fruit of the poisonous tree doctrine in a temporal sense. Trade secrets are protected only until they are publicly disclosed.²⁴ Nonetheless, courts will sometimes grant injunctions that prevent the defendant from using the secret or products developed with it even after the secret becomes public. These “head-start injunctions” are available to plaintiffs who eventually published or otherwise disclosed their secret after it was misappropriated.²⁵ For instance, suppose Anne possesses a secret that she is in the process of commercializing. Suppose further that it takes Anne two years after developing the secret to bring the product to market, at which point the secret is disclosed. If Benjamin steals Anne’s idea during the development process (say, after one year), Benjamin will be able to get to market one year earlier than if he had waited until the information became public. In such a case, courts will issue a “head-start” injunction for a period of one year, putting Benjamin in the same position he would have been without the secret. Even if such an injunction is impossible (for example, because Benjamin has already entered the market), courts may allow him to continue using the former secret but require him to pay a “reasonable royalty” to Anne.²⁶ The reasonable royalty is set to approximate the royalty Anne might have charged Benjamin in a voluntary transaction.²⁷ But it is a payment for sales of products made using information that is no longer secret, and thus for a use that would not infringe but for the fruit of the poisonous tree doctrine. Some courts have taken this idea even further, turning head-start injunctions into permanent injunctions preventing any use of information

24. PETER S. MENELL, MARK A. LEMLEY & ROBERT P. MERGES, *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE* 70 (2017 ed.).

25. *Id.* at 139. For examples, see *K-2 Ski Co. v. Head Ski Co.*, 506 F.2d 471, 474 (9th Cir. 1974) (“We are satisfied that the appropriate duration for the injunction should be the period of time it would have taken Head, either by reverse engineering or by independent development, to develop its ski legitimately without use of the K-2 trade secrets.”); *Winston Research Corp. v. Minn. Mining & Mfg. Co.*, 350 F.2d 134, 145–46 (9th Cir. 1965) (discussing injunction protection for a machine company); *Verigy US, Inc. v. Mayder*, No. C-07-04330 RMW, 2008 WL 564634, at *9, *11 (N.D. Cal. Feb. 29, 2008) (granting a five-month injunction to account for the lag time defendant would have faced in getting to market absent misappropriation).

26. See *Mid-Mich. Comp. Sys. v. Marc Glassman, Inc.*, 416 F.3d 505, 510 (6th Cir. 2005) (basing damages for misappropriation of computer software on a reasonable royalty).

27. See *id.* (reasoning that the reasonable royalty calculation takes into account what the license price should have been but for the misappropriation). At least one commentator has suggested that such a remedy “is peculiarly inappropriate to redress a situation where injunctive relief ought to be applied.” See 12 ROGER MILGRIM, *MILGRIM ON TRADE SECRETS* § 1.01 [2] [a], at 1–36 n.20 (citing a district court decision concluding that limiting relief to a reasonable royalty invites misappropriation).

even after it is no longer secret,²⁸ but that is beyond what even the broadest causal theory of trade secret law should allow.

2. Patent Law

i. Patent Law Generally Doesn't Apply the Fruit of the Poisonous Tree Doctrine

In contrast to trade secret law, patent law employs the fruit of the poisonous tree doctrine in much more limited and contested ways. Patent infringement is defined largely by the scope of the patent claims and the duration of the patent. Only products or acts that include each and every element of a patent claim or their equivalents are deemed infringing.²⁹ As a result, courts will not enjoin end products that do not have all the elements of the patent claim, even if they were produced using the patented invention as a template and even if the products were infringing in the lab and only altered to be non-infringing before production.³⁰ Indeed, “designing around” a patent by starting with the patented product and then changing it enough to avoid infringement is not only not forbidden, it is actively encouraged.³¹

28. *E.g.*, *Halliburton Energy Servs. v. Axis Techs.*, 444 S.W.3d 251, 255, 263 (Tex. Ct. App. 2014) (wrongly asserting that permanent injunctions are the traditional trade secret remedy). *Contra* *Syntex Ophthalmics, Inc. v. Novicky*, 745 F.2d 1423, 1435–37 (Fed. Cir. 1984); *K-2 Ski Co.*, 506 F.2d at 474; *Superior Gearbox Co. v. Edwards*, 869 S.W.2d 239, 257 (Mo. Ct. App. 1994); *Richard F. Dole, Jr., Permanent Injunctive Relief for Trade Secret Misappropriation Without an Express Limit Upon its Duration: The Uniform Trade Secrets Act Reconsidered*, 17 B.U.J. SCI. & TECH. L. 173, 196–98 (2011). Courts have also allowed parties to continue to receive royalties on a contract that licenses a trade secret even after the information is no longer secret. *See Warner-Lambert Pharm. Co. v. John J. Reynolds, Inc.*, 178 F. Supp. 655, 666 (S.D.N.Y. 1959). That too can be viewed as a form of temporal extension to unprotected secrets, though it is less clear that trade secret law rather than contract law is responsible.

29. *See* *Centillion Data Sys., LLC v. Qwest Commc'ns Int'l*, 631 F.3d 1279, 1284 (Fed. Cir. 2011).

30. *See, e.g.*, *MicroStrategy Inc. v. Bus. Objects, S.A.*, 429 F.3d 1344, 1352 (Fed. Cir. 2005) (no literal infringement where accused product did not contain every element of the claim); *Cross Med. Prods. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1311 (Fed. Cir. 2005) (no direct infringement where accused product did not include each claim limitation).

31. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 36 (1997) (contrasting “the intentional copyist making minor changes to lower the risk of legal action” with “the incremental innovator designing around the claims, yet seeking to capture as much as is permissible of the patented advance”); *see also* *Slimfold Mfg. Co. v. Kinkead Indus.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991) (“Designing around patents is, in fact, one of the ways in which the patent system works to the advantage of the public in promoting progress in the useful arts, its constitutional purpose.”); *State Indus. v. A.O. Smith Corp.*, 751 F.2d 1226, 1236 (Fed. Cir. 1985) (“One of the benefits of a patent system is its so-called ‘negative incentive’ to ‘design around’ a competitor’s products, even when they are patented, thus bringing a steady flow of innovations to the marketplace.”); *Craig Allen Nard, A Theory of Claim Interpretation*, 14 HARV. J.L. & TECH. 1, 40–41 (2000) (“The practice of designing-around extant patents creates viable substitutes and advances, resulting in competition among patented technologies. The public clearly benefits from such activity.” (citation omitted)); *Matthew J. Conigliaro, Andrew C. Greenberg & Mark A. Lemley, Foreseeability in Patent Law*, 16 BERKELEY TECH. L.J. 1045, 1048 (2001).

Further, with rare exceptions, a patent can be enforced only against products that are made, used, or sold during the 20-year life of the patent.³² Acts that occur before the patent issues are not infringing.³³ Nor are acts that occur once the patent expires.³⁴

Patent law is also territorial. A U.S. patent can be enforced only against acts of infringement in the United States.³⁵ There are limited exceptions for cases of cross-border infringement.³⁶ Courts and agencies sometimes transgress that territorial boundary, seeking to award damages for worldwide sales based on conduct in the United States or to control the importation of data about an invention rather than the invention itself, but the Federal Circuit has generally rejected those approaches.³⁷

32. 35 U.S.C. § 271(a) (2012).

33. *Nat'l Presto Indus. v. West Bend Co.*, 76 F.3d 1185, 1196 (Fed. Cir. 1996) (“Although the tort of inducement is itself prospective, in that the direct infringement will not have occurred until after the acts of inducement, when no patent has issued at the time of the inducement there can not be a violation of § 271 (b). The principle of liability for ‘aiding and abetting’ the wrongful acts of others is not imposed retrospectively, to make illegal an act that was not illegal when it was done.”); *State Indus.*, 751 F.2d at 1236 (“To willfully infringe a patent, the patent must exist and one must have knowledge of it.”). There is, however, a limited exception allowing a patent owner to collect royalties from a defendant who copies the invention after reading a published pending patent application. 35 U.S.C. § 154(d) (2012). And 35 U.S.C. § 271(e)(1) defines certain acts by generic pharmaceutical companies seeking regulatory approval to market a patented drug to be acts of infringement.

34. “It is accepted black-letter law that once a patent expires, others are free to use its teachings and to make, use, and sell competing products.” ROBERT P. MERGES, PETER S. MENELL & MARK A. LEMLEY, *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE* 412 (6th ed. 2012).

35. 35 U.S.C. § 271(a).

36. *See* 35 U.S.C. § 271(f)–(g); *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1321–24 (Fed. Cir. 2005).

37. *See, e.g.*, *ClearCorrect Operating, LLC v. Int'l Trade Comm'n*, 810 F.3d 1283, 1286 (Fed. Cir. 2015) (computer data emailed into the U.S. was not an “article” for purposes of law banning importation of infringing articles); *Carnegie Mellon Univ. v. Marvell Tech. Grp.*, 807 F.3d 1283, 1306–08 (Fed. Cir. 2015) (damages must be calculated based on making, using, or selling the invention in the United States); *Bayer AG v. Housey Pharm., Inc.*, 340 F.3d 1367, 1377 (Fed. Cir. 2003) (importation of data produced abroad by invention does not infringe patent); *see also* *Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 442 (2007) (software copies made abroad and installed on foreign-made computers were not “suppl[ied] . . . from the United States” and did not constitute infringement (second alteration in original)). Notably, however, *Carnegie Mellon* extended the reach of patent law somewhat by holding that if one of the infringing acts (there, sale) took place in the United States the plaintiff could obtain damages based on the value of the sold good even if its making and use both occurred abroad. *Carnegie Mellon*, 807 F.3d at 1288; *cf.* *WesternGeco L.L.C. v. ION Geophysical Corp.*, 791 F.3d 1340, 1350–51 (Fed. Cir. 2015) (rejecting the application of § 271(f) to profits from uses abroad of products exported from the United States, but affirming the award of a reasonable royalty on the devices themselves); *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1371–72 (Fed. Cir. 2013) (“[T]he entirely extraterritorial production, use, or sale of an invention patented in the United States is an independent, intervening act that, under almost all circumstances, cuts off the chain of causation initiated by an act of domestic infringement.”). For discussion, see generally Bernard Chao, *Patent Imperialism*, 109 NW. U. L. REV. ONLINE 77 (2014) (discussing territorial limitations on patent infringement recovery); and Timothy R. Holbrook, *Boundaries, Extraterritoriality, and*

ii. *Circumstances in Which Patent Law Captures the Fruit of the Poisonous Tree*

Patent law does nonetheless contain some features that implement the fruit of the poisonous tree doctrine in limited part. Some courts have adopted a limited version of the “head-start” theory, awarding damages (though not an injunction) against products sold after the patent expired but that would not have been produced or placed on the market had the defendant not started making them during the life of the patent.³⁸ While this theory does in some sense extend the power of the patent beyond its expiration, it is significantly more limited than the head-start injunction in trade secret law.

Patent law also punishes conduct that does not itself infringe a patent but that facilitates another’s infringement of a patent by another, either by encouraging someone else to infringe (inducement) or by providing components that contribute to infringement by another (contributory infringement).³⁹ If I sell a product that does not itself infringe, but that has no substantial use other than to infringe, I am a contributory infringer. My product is effectively declared contraband, even though it is not itself covered by a patent, because it is mostly, but not entirely, used by others to infringe.⁴⁰ Inducing another to infringe a patent might seem more directly tied to acts of infringement, but even there, a number of courts have awarded damages for inducement without evidence of correlative direct infringement⁴¹ or enjoined products that do not themselves infringe but that might (or might not) be used by customers to infringe.⁴²

Additionally, patent law has essentially rejected an experimental use defense, except in the context of research on pharmaceuticals for purposes

Patent Infringement Damages, 92 NOTRE DAME L. REV. 1745 (forthcoming 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2885009 (analyzing Federal Circuit decisions that address the scope of damages under § 271(f)).

38. See, e.g., *Amsted Indus. Inc. v. Nat’l Castings, Inc.*, No. 88 C 924, 1990 WL 106548, at *20 (N.D. Ill. July 11, 1990); *TP Orthodontics, Inc. v. Prof’l Positioners, Inc.*, No. 72-C-697, 1990 WL 268846, at *10 (E.D. Wis. June 9, 1990); *BIC Leisure Prods., Inc. v. Windsurfing Int’l, Inc.*, 687 F. Supp. 134, 136–38 (S.D.N.Y. 1988). To be clear, making the patent is itself an act of infringement even if you don’t sell it. But these cases extend damages to cover products that were “in process” but not actually made at the time the patent expired.

39. 35 U.S.C. § 271(b)–(c) (2012). For an argument that patent law should look beyond who actually infringes to punish those causally responsible for the act, see generally Dmitry Karshedt, *Causal Responsibility and Patent Infringement*, 70 VAND. L. REV. 565 (2017).

40. See generally *Dawson Chem. Co. v. Rohm & Haas Co.*, 448 U.S. 176 (1980) (discussing contributory infringement).

41. For a discussion of the different approaches to damages for inducement, see generally Dmitry Karshedt, *Damages for Indirect Patent Infringement*, 91 WASH. U. L. REV. 911 (2014).

42. *Suprema, Inc. v. Int’l Trade Comm’n*, 796 F.3d 1338, 1352 (Fed. Cir. 2015). Judge Dyk’s dissent points out that the ITC banned all phones from entering the United States because some (but not all) buyers of those phones might run software that infringed the patent. *Id.* at 1353–54 (Dyk, J., dissenting).

related to FDA approval.⁴³ As a result, while it is legal to make and sell an end product that the defendant has designed to avoid infringement, the act of getting to that end product might itself be infringing. If the patentee learns of an act of research that involves using a patented invention, it can sue for infringement, and may be able to stop the act of research. That happened in *Madey v. Duke University*, for instance.⁴⁴ But stopping the act of research will also prevent the making and selling of the fruits of that research—the non-infringing products that would have resulted but for the injunction. Therefore, in a theoretical sense at least, patent law has the effect of preventing the defendant from obtaining the fruit of the poisonous tree.

As a practical matter, though, it is unlikely that a patent owner will get an injunction stopping research before the defendant can produce non-infringing end products. First, research often happens behind closed doors, so the patentee may not find out about the infringement until it is too late. The reason there aren't very many cases against experimental uses may simply be because no one knows about them.⁴⁵ Second, even if the patentee does detect the infringement, it takes time to bring a lawsuit to completion, and preliminary injunctions are rarely granted in patent cases.⁴⁶ Third, since 2006, even if the patentee wins, it will not necessarily obtain a permanent injunction,⁴⁷ and if it does not, the non-infringing end product will be produced.

What about a claim for damages in such a case? If damages are calculated only based on the infringing research, they are likely to be small, and they do not implicate the fruit itself. But some patentees have sought “reach-through royalties” calculated not based on the actual infringing use but on the value of the non-infringing downstream product.⁴⁸ This *is* a fruit of the poisonous tree argument. The theory is that because the non-infringing downstream product would not have resulted but for the infringing research, the patentee's damages should include the value of the non-infringing material that resulted from that research.

43. See 35 U.S.C. § 271(e)(1); *Integra Lifesciences I, Ltd. v. Merck KGaA*, 331 F.3d 860, 870–71 (Fed. Cir. 2003); *Madey v. Duke Univ.*, 307 F.3d 1351, 1360–63 (Fed. Cir. 2002).

44. *Madey*, 307 F.3d at 1352–53.

45. *Madey* is an exception because he worked at Duke and sued when they continued using his research equipment after he left. *Id.*

46. Dennis Crouch finds that even when parties seek preliminary injunctions (and they often do not), they win them less than 20% of the time. Dennis Crouch, *The Impact of eBay on Injunctive Relief in Patent Cases*, PATENTLY-O (July 16, 2015), <http://patentlyo.com/patent/2015/07/impact-injunctive-patent.html>.

47. See generally *eBay, Inc. v. MercExchange L.L.C.*, 547 U.S. 388 (2006).

48. See generally Robin C. Feldman, *The Insufficiency of Antitrust Analysis for Patent Misuse*, 55 HASTINGS L.J. 399 (2003); Alfred C. Server et al., *Reach-Through Rights and the Patentability, Enforcement, and Licensing of Patents on Drug Discovery Tools*, 1 HASTINGS SCI. & TECH. L.J. 21 (2009); Donald R. Ware, *Research Tool Patents: Judicial Remedies*, 30 AIPLA Q.J. 267, 282–87 (2002).

The status of such reach-through royalty claims in patent law is unclear. Patent damages are supposed to compensate the patentee for its losses, not to disgorge the defendant's profits.⁴⁹ At one level, it does not seem likely that the making of a non-infringing product injured the plaintiff. Even if the patentee competes with the non-infringing product, any lost profits seem proximately caused by something other than infringement—the non-infringing product. But patent law also allows a plaintiff who cannot show lost profits to recover a reasonable royalty.⁵⁰ And the reasonable royalty is calculated, with a fair degree of circularity, based on what the patentee and the infringer would have agreed to if there were no infringement.⁵¹ So if the parties to licensing transactions regularly enter into reach-through royalty agreements, the courts might award reach-through royalties since they would be reasonably expected in transactions of this type. And if courts are likely to award reach-through royalties, parties may well negotiate them rather than going to court.⁵² The Federal Circuit faced this issue indirectly in *Integra Lifesciences I, Ltd. v. Merck KGaA*.⁵³ While it did not expressly hold reach-through royalties permissible, and it vacated the award of damages in that case, the Federal Circuit suggested reach-through may be an appropriate way to calculate royalties:

The value to a licensee of research tools lies, in part, in the point at which those tools are employed in the drug development continuum. A research tool enabling the identification of a drug candidate during high throughput screening, for instance, may supply more value to the ultimate invention than a research tool used to confirm an already recognized drug candidate's safety or efficacy. . . . Similarly, the amount Merck would agree to pay for

49. See generally Dane S. Ciolino, *Reconsidering Restitution in Copyright*, 48 EMORY L.J. 1 (1999) (noting that Congress abolished a right to defendant's profits in patent law in 1946). Design patents are an exception to this rule. An award of defendant's profits there is mandatory under 35 U.S.C. § 289. See Mark A. Lemley, *A Rational System of Design Patent Remedies*, 17 STAN. TECH. L. REV. 219, 223–24 (2013), though how far those profits extend is unclear after *Samsung Electronics Co. v. Apple Inc.*, 137 S. Ct. 429 (2016).

50. 35 U.S.C. § 284 (2012).

51. *Riles v. Shell Expl. & Prod. Co.*, 298 F.3d 1302, 1311 (Fed. Cir. 2002); Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627 (2010); Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 (2007); Jonathan S. Masur, *The Use and Misuse of Patent Licenses*, 110 NW. U. L. REV. 115 (2015) (all noting this circularity problem).

52. Reach-through royalty agreements are sufficiently common in certain fields, particularly biomedical research, that the NIH set out guidelines to govern their use in 1999. See Principles and Guidelines for Recipients of NIH Research Grants and Contracts on Obtaining and Disseminating Biomedical Research Resources: Final Notice, 64 Fed. Reg. 72,090 (Dec. 23, 1999). For discussion, see generally Kimberlee A. Stafford, Comment, *Reach-Through Royalties in Biomedical Research Tool Patent Licensing: Implications of NIH Guidelines on Small Biotechnology Firms*, 9 LEWIS & CLARK L. REV. 699 (2005).

53. See generally *Integra Lifesciences I, Ltd. v. Merck KGaA*, 331 F.3d 860 (Fed. Cir. 2003).

Integra's RGD technology could be influenced by the point of placement of this technology in its drug development process.⁵⁴

At least one court has applied the reach-through royalty theory to award \$1 billion in damages, one of the largest patent verdicts in history. In *Monsanto v. DuPont*, the jury awarded \$1 billion in damages based on DuPont's use of Monsanto's patented soybean line in research while developing its own products, even though DuPont had not yet brought its own product to market.⁵⁵ If courts award damages based on the value of non-infringing downstream products produced using infringing research tools, as they did in *Monsanto*, they are applying a version of the fruit of the poisonous tree doctrine.

Patent courts have awarded damages based on the sale of non-infringing products in three other situations. First, courts will award damages based on the patentee's lost sales of products that do not themselves practice the patent if the sales were lost to the defendant's infringing sales.⁵⁶ The idea is that the patentee was injured by the infringing acts, even though the patentee's loss was not of the sales of patented products. That's not really a fruit of the poisonous tree issue, though, because the defendant is in fact depriving the plaintiff of sales by selling its own infringing product. But the patentee's sales being protected are themselves of non-infringing products.

Second, patent law allows the patentee to recover "convoyed sales"—sales of products that are usually bundled in a package with the infringing product.⁵⁷ Those peripheral devices are not themselves patented, but patent law will award damages for their sale so long as there is a physical nexus between the infringing product and the convoyed devices.⁵⁸ The sale of a phone case is a fruit of the infringing smart phone. Patent law allows recovery of that sale even though it is not infringing, but it does so only in limited circumstances: when the goods are physically connected and generally sold

54. *Id.* at 871. Because the finding of infringement was reversed by the Supreme Court, 545 U.S. 193 (2005), the courts never resolved the reach-through royalty issue definitively.

55. See Bernard Chao & Jonathan R. Gray, *A \$1 Billion Parable*, 90 DENV. L. REV. ONLINE 185 (2013), http://static1.1.sqspcdn.com/static/f/276323/23168702/1374632594050/1+Billion+Parable_Chao_Gray_Final-Format.pdf; Dennis Crouch, *Monsanto Wins \$1b Verdict on RoundUp Ready Seed Patent*, PATENTLY-O (Aug. 8, 2012), <https://patentlyo.com/patent/2012/08/monsanto-wins-1b-verdict-on-roundup-ready-seed-patent.html>. I use press reports of the case because, unforgivably, the entire case record is under seal. See Bernard Chao & Derigan Silver, *A Case Study in Patent Litigation Transparency*, 2014 J. DISP. RESOL. 83, 87 (2014) (discussing the Supreme Court's history of supporting an open judicial process).

56. *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1546 (Fed. Cir. 1995) (en banc).

57. See *King Instruments Corp. v. Perego*, 65 F.3d 941, 950, 956 (Fed. Cir. 1995) ("As long as the patentee receives a proper economic return on its investment in the acquisition of a patent, the Act does not require that return to come from the sale of patented products."). The *King Instruments* court also describes the calculation of damages as a "but for" causation inquiry. *Id.* at 952.

58. *Warsaw Orthopedic, Inc. v. Nuvasive, Inc.*, 778 F.3d 1365, 1375 (Fed. Cir. 2015), *vacated on other grounds*, 136 S. Ct. 893 (2016); *Am. Seating Co. v. USSC Grp., Inc.*, 514 F.3d 1262, 1268 (Fed. Cir. 2008).

together. Conveyed sales don't cover, say, the likelihood that people who buy a smartphone from Apple in year one will also likely buy their next generation phone from Apple.

The final patent law rule that implements the fruit of the poisonous tree is the "entire market value" rule.⁵⁹ Often misunderstood,⁶⁰ the entire market value rule is a specific instance of the conveyed sales doctrine that applies when a patent covers one component of a larger integrated product. For example, people buy cars, not pieces of cars. If I have a patent on one component of a car, I would like to be awarded damages based on the value of the entire car. Patent law will permit that award based on the unpatented as well as the patented components only in rare circumstances; the patentee must demonstrate that it is the patented component that drives the demand for the whole product.⁶¹ The patent on the active ingredient of a drug, for instance, drives the sales of that drug, even though the drug also has a candy coating and other inactive components.⁶² By contrast, the patent on the intermittent windshield wiper is unlikely to drive the sale of a car. When the motivating force behind the purchase of a multicomponent product is the patented invention, the patentee effectively gets control over the entire product. The non-infringing components are the fruit of the poisonous tree.

3. Design Patents

Design patent law, like utility patents, defines the invention by using claims.⁶³ A defendant infringes the design patent only if its product includes the claim element.⁶⁴ Unlike utility patent law, there isn't much risk of infringing a design during a research phase. So in most respects, design patent law does not apply the fruit of the poisonous tree doctrine.

In one important respect, however, design patent law does extend to cover the fruit of the poisonous tree—and indeed even beyond. When a design covers only one aspect of a larger product—an increasingly common occurrence⁶⁵—the law nonetheless awards the design patent owner the

59. See generally Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 WM. & MARY L. REV. 655 (2009) (discussing the "entire market value" rule and its limits).

60. For an example of such a misunderstanding, see *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301 (Fed. Cir. 2009). For an explanation of why that is a misunderstanding, see Lemley, *supra* note 59, at 662 n.34.

61. *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1318–19 (Fed. Cir. 2011).

62. *But cf. Astrazeneca AB v. Apotex Corp.*, 782 F.3d 1324, 1333–37 (Fed. Cir. 2015) (finding that a 50% royalty was appropriate for a follow-on patent on a drug dissolution profile even after the patent on the active ingredient had expired, on the theory that the second patent was necessary to sell the product).

63. *Egyptian Goddess, Inc. v. Swisa, Inc.*, 543 F.3d 665, 679 (Fed. Cir. 2008) (en banc).

64. *Id.*

65. See generally Jason J. Du Mont & Mark D. Janis, *Virtual Designs*, 17 STAN. TECH. L. REV. 107 (2013); Mark P. McKenna & Katherine J. Strandburg, *Progress and Competition in Design*, 17 STAN. TECH. L. REV. 1 (2013).

defendant's entire profits from the sale of the product.⁶⁶ Thus, when Samsung copied the design for the iTunes icon depicted on an iPhone screen, the Federal Circuit held it liable not just for the value of that icon, but for the entire value of its whole smartphone.⁶⁷ That rather remarkable rule is a mutant form of the poisonous tree doctrine. Adopting a patented design, no matter how inconsequential, taints any product to which it is attached, no matter how much non-infringing material is also there. The taint applies even if there is no but-for causation—if the non-infringing elements literally have nothing at all to do with the patented design. I have elsewhere criticized this rule and suggested ways it could be restricted.⁶⁸ The Supreme Court has vacated the *Samsung* decision and remanded with a suggestion (though not a command) that the courts should not apply the rule in that case.⁶⁹ But at least for now, given § 289, design patents award the patentee the fruit of the poisonous tree, and indeed pretty much anything in the same forest as the tree.

4. Copyright Law

Like patent law, copyright law takes a variety of intermediate positions on the fruit of the poisonous tree. As a general matter, copyright law offers IP owners control over only the original elements of their work copied by others.⁷⁰ A defendant who copies a portion of the work is liable for doing so, and copyright law can include disgorgement of a defendant's ill-gotten gains,⁷¹ but copyright law apportion damages so that the plaintiff is compensated only for those parts of the defendant's work that copy from the plaintiff.⁷² Indeed, unlike trade secret and patent law, copyright law will not allow reach-through remedies. When a defendant engages in intermediate copying in order to produce a final work that doesn't incorporate any of the original copyrighted material, courts refuse to enjoin or punish the sale of the finished product. Indeed, copyright law goes out of its way to treat even this intermediate use as non-infringing in many circumstances if it results in the production of a non-infringing work.⁷³ For example, copyright law permits a defendant to use a copyrighted factual work—such as a map—to check the accuracy of its own, independently-created factual work.⁷⁴ The Copyright Act

66. 35 U.S.C. § 289 (2012).

67. *Apple Inc. v. Samsung Elecs. Co.*, 786 F.3d 983, 989 (Fed. Cir. 2015).

68. *See generally* Lemley, *supra* note 49.

69. *See generally* *Samsung Elecs. Co. v. Apple Inc.*, 137 S. Ct. 429 (2016).

70. *See Alfred Bell & Co. v. Catalda Fine Arts, Inc.*, 191 F.2d 99, 104–05 (2d Cir. 1951).

71. 17 U.S.C. § 504 (2012).

72. *See Sheldon v. Metro-Goldwyn Pictures Corp.*, 309 U.S. 390, 399 (1940).

73. *See generally* *Sony Comput. Entm't v. Connectix Corp.*, 203 F.3d 596 (9th Cir. 2000); *Sega Enters. v. Accolade, Inc.*, 977 F.2d 1510 (9th Cir. 1992).

74. *See Jewelers' Circular Pub. Co. v. Keystone Pub. Co.*, 274 F. 932, 935 (S.D.N.Y. 1921). By contrast, copying the plaintiff's map into the defendant's—as often proven by common

also contains a provision designed to ensure that a copyright on the depiction of a work cannot be parlayed into control over the work itself.⁷⁵

Copyright law does, however, extend control to the fruit of the poisonous tree in certain respects. While copyright law apportions damages, it is less careful in limiting the scope of injunctions. A court is likely to enjoin the sale of a product that includes copyrighted material, even if it also includes significant uncopyrighted material.⁷⁶ While a significant enough transformation may excuse the defendant's use as a fair use, making changes to a copyrighted work is not generally sufficient to avoid liability.⁷⁷ If the changes cannot easily be separated from the original—as is often the case for derivative works like translations, sequels, or movie adaptations of books—the defendant loses any claim to its added creativity.⁷⁸ In theory, that unlawfully added creativity falls into the public domain, but in practice it is only the original copyright owner who can make use of the added material, because anyone else would infringe the original by using the added material. The new

errors—is not permitted. *See also generally* Gen. Drafting Co. v. Andrews, 37 F.2d 54 (2d Cir. 1930) (permitting use of the plaintiff's work for comparison or checking but finding that the defendant went beyond that).

75. 17 U.S.C. § 113(b). While the text of that statute is opaque, it serves to prevent copyright owners from laying claim to useful articles based on copyrights covering the depiction of those useful articles. *See* 17 U.S.C. § 113(b); H.R. Rep. No. 94-1476, at 105 (1976) (“[C]opyright in a pictorial, graphic, or sculptural work, portraying a useful article as such, does not extend to the manufacture of the useful article itself.”); *Ultraflo Corp. v. Pelican Tank Parts, Inc.*, 845 F.3d 652, 658 (5th Cir. 2017) (“Although the Copyright Act provides the owner of such a drawing the exclusive right to reproduce the drawing itself, it does not grant the exclusive right to use the drawing to make the useful article depicted.”); *Forest River, Inc. v. Heartland Recreational Vehicles, Inc.*, 753 F. Supp. 2d 753, 758–60 (N.D. Ind. 2010) (rejecting the argument that “a copyright in a technical drawing of a non-architectural useful article precludes another party from using copies of that drawing to construct the useful article,” but allowing “a claim for copyright infringement as to the copies (as distinct from the actual [article]).” (alteration in original)); *Gusler v. Fisher*, 580 F. Supp. 2d 309, 315 (S.D.N.Y. 2008) (“[Plaintiff] holds a copyright in a technical drawing of a useful article, which does not preclude Defendants’ manufacturing and marketing of the article itself.”); *Niemi v. Am. Axle & Mfg. Holding, Inc.*, No. 05-74210, 2006 WL 2077590, at *3 (E.D. Mich. July 24, 2006) (“[T]he manufacture of a machine from a copyrighted technical drawing is clearly not copyright infringement.”); GENERAL REVISION OF U.S. COPYRIGHT LAWS, REGISTER OF COPYRIGHTS 14–15 (1961), www.copyright.gov/history/1961_registers_report.pdf. Nonetheless, courts sometimes get this wrong. *See generally, e.g.*, *Tire Eng’g & Distrib., LLC v. Shandong Linglong Rubber Co.*, 682 F.3d 292 (awarding damages based on the sales of tires for infringement of a copyright that covered drawings of tires, despite § 113(b)).

76. *See generally, e.g.*, *Woods v. Universal City Studios, Inc.*, 920 F. Supp. 62 (S.D.N.Y. 1996) (enjoining the movie *12 Monkeys* mid-release because one scene depicted the plaintiff’s copyrighted chair).

77. *Sheldon v. Metro-Goldwyn Pictures Corp.*, 81 F.2d 49, 56 (2d Cir. 1936) (“[N]o plagiarist can excuse the wrong by showing how much of his work he did not pirate.”).

78. *See, e.g.*, 17 U.S.C. § 103 (2012); *Anderson v. Stallone*, No. 87-059, 1989 WL 206431 (C.D. Cal. Apr. 25, 1989) (holding that the author of an unauthorized sequel to the movie *Rocky* held no rights in his original work on the sequel); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989 (1997) (criticizing this rule).

material is the fruit of the poisonous tree, and the law, by depriving the defendant of the benefit of it, effectively consigns it to the copyright owner.

5. Trademark Law

Trademark law largely does not allow trademark owners any control over downstream fruits of the poisonous tree.⁷⁹ A defendant that uses a mark that is confusingly similar to a plaintiff's mark is likely to be enjoined from continued use of that mark, but in most circuits, the ordinary trademark case will not result in damages unless the defendant willfully infringed the trademark.⁸⁰ Even when trademark law does award damages or disgorges defendant's profits, the profits in question must be attributed to sales the defendant made due to confusion. A defendant may benefit from using a plaintiff's trademark to attract attention, but the law will generally not trace the effects of that benefit beyond sales made using the plaintiff's mark.⁸¹

The closest trademark law comes to assigning the fruit of the poisonous tree to plaintiffs lies in the scope of relief courts grant once they have found infringement. Injunctions are generally limited to prevent only infringing conduct.⁸² A court that has found infringement may broaden the scope of the injunction, prohibiting not only the defendant's mark, but other marks that seem similar but that might not necessarily be confusing.⁸³ That does give trademark owners control beyond the scope of their IP right in a limited sense, but it isn't really control over the fruit of the poisonous tree per se.

79. It is true, however, that trademark law has dramatically expanded what it defines as infringement. So things that were not infringing 50 years ago are swept within the scope of trademark law—not because the law reaches beyond infringement, but because we have redefined what constitutes infringement. *See generally* Mark A. Lemley & Mark P. McKenna, *Owning Mark(et)s*, 109 MICH. L. REV. 137 (2010); Glynn S. Lunney, Jr., *Trademark Monopolies*, 48 EMORY L.J. 367 (1999).

80. J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 30:58 (4th ed. 1996) (collecting cases showing that most cases deny damages); Peter J. Karol, *Trademark's eBay Problem*, 26 FORDHAM INTELL. PROP., MEDIA, & ENT. L.J. 625 (2016). For a discussion of this issue. *See generally* Mark A. Lemley, *Did eBay Irreparably Injure Trademark Law?*, 92 NOTRE DAME L. REV. 1795 (2017).

81. *Lindy Pen Corp. v. Bic Pen Corp.*, 982 F.2d 1400, 1408 (9th Cir. 1993) (“[A]n accounting is intended to award profits only on sales that are attributable to the infringing conduct.”).

82. *See Westchester Media v. PRL USA Holdings, Inc.*, 214 F.3d 658, 671 (5th Cir. 2000) (Injunctive relief “for trademark infringement should be no broader than necessary to prevent the deception.”).

83. *Patsy's Brand, Inc. v. I.O.B. Realty*, 317 F.3d 209, 220 (2d Cir. 2003). “[A] party who has once infringed a trademark may be required to suffer a position less advantageous than that of an innocent party.” *Id.* (quoting *Oral-B Labs., Inc. v. Mi-Lor Corp.*, 810 F.2d 20, 24 (2d Cir. 1987)). “[A]nd a court can frame an injunction which will keep a proven infringer safely away from the perimeter of future infringement.” *Id.* (quoting MCCARTHY, *supra* note 80, § 30:4); *see also* *Guthrie Healthcare Sys. v. ContextMedia, Inc.*, 826 F.3d 27, 47 (2d Cir. 2016) (district court erred by granting injunction limited to areas where confusion had been shown; defendant should not be allowed to use confusing marks in any geographic region).

Courts also sometimes order corrective advertising designed to undo the harm caused by deceiving consumers.⁸⁴ That too seems to reach beyond the scope of infringement by trying to restore the status quo as it would have been but for the infringement. But corrective advertising is supposed to be directly related to the act of infringement, rather than a general effort to undo the infringement's downstream effects. Moreover, most courts that award corrective advertising don't require the defendant to run the ads itself, instead awarding money which can be—but need not be—used for corrective advertising.⁸⁵

6. Punitive Damages

Finally, every form of IP law permits a court to enhance damages in certain circumstances, usually based on a determination that the infringement is intentional or willful. Patent, design patent, trade secret, and trademark law all permit courts to award up to three times actual damages and attorneys' fees in such a case,⁸⁶ while copyright law permits enhanced statutory damages and an award of attorneys' fees.⁸⁷ Enhanced damage awards are designed to deter willful infringement. But unlike other punishments (say, prison), they are also a form of fruit of the poisonous tree doctrine. The defendant must pay money in addition to the money directly attributable to infringement, so the IP owner gets compensated not only for the act of infringement, but also paid profits that were not attributable directly to the infringement.

III. WHEN SHOULD IP OWNERS CAPTURE THE FRUIT OF THE POISONOUS TREE?

IP law does not seem to have a consistent, coherent approach to extending control beyond the scope of the IP right itself to encompass the fruit of the poisonous tree. That is not necessarily a bad thing; IP regimes differ, and maybe their rules about the fruit of the poisonous tree should differ as well. But, it would be helpful to understand why we might want (or not want) to allocate control over downstream non-infringing works. In this Part, I offer a systematic way to think about when IP owners should control or be compensated for downstream non-infringing products that owe their origins to acts of infringement.

84. *Big O Tire Dealers, Inc. v. Goodyear Tire & Rubber Co.*, 561 F.2d 1365, 1375 (10th Cir. 1977). For a discussion of the circumstances under which corrective advertising is available, see MCCARTHY, *supra* note 80, § 30:6.

85. See *Big O Tire Dealers, Inc.*, 561 F.2d at 1375.

86. 15 U.S.C. § 1117(a) (2012) (trademarks); UNIF. TRADE SECRETS ACT § 3(b) (UNIF. LAW COMM'N 1979) (trade secrets); *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 136 S. Ct. 1923, 1928 (2016) (patents).

87. 17 U.S.C. §§ 504(c), 505 (2012).

A. FACTORS TO CONSIDER

Two, maybe three factors should matter in deciding how much downstream control we give to IP owners. The first factor that should matter is how different and how valuable the defendant's added work is.⁸⁸ Giving an IP owner control over the fruit of the poisonous tree necessarily assigns some or all of the value of the non-infringing downstream work to the upstream IP owner. Doing so might conceivably increase the incentive of the original IP owner to create by increasing total compensation or control. However, the effect is likely attenuated, since by definition we are giving IP owners control over something that is outside the scope of their IP and in most cases unforeseeable. At the same time, it will definitely reduce the reward to, and therefore the incentive of, the defendant who produces the non-infringing work. That might not bother us if we think that non-infringing work is not particularly valuable, but the more valuable the defendant's contribution is, the more reluctant we should be to ban it or require the defendant to disgorge its profits from that non-infringing work.

A second factor that might affect whether we want to allocate the fruit of the poisonous tree to the IP owner is whether the defendant was a willful infringer. One reason to deprive a defendant of downstream benefits traceable to infringement is to deter the act of infringement. But deterrence only works against people who make a deliberate decision to infringe. Accidental infringement cannot easily be deterred, at least not without also deterring legitimate business activity. By contrast, we might want to punish, and therefore deter, willful acts of infringement. Indeed, all IP regimes do so, usually with a damages multiplier.⁸⁹ The purpose of targeting willful infringement is not to impose a moral judgment. Rather, it is to try to shunt people who make a deliberate decision to infringe into licensing negotiations instead. That is much easier to do with people who act deliberately than with those who do not know they are infringing.

A third factor we might (or might not) want to consider is the efficacy of direct IP remedies in compensating the IP owner. In some circumstances, as with patented research tools or trade secrets used in manufacturing processes, enforcement of IP rights against direct acts of infringement may be difficult or unremunerative. We might worry that those IP rights will not effectively be enforced if the IP owner can only bring suit against direct acts of infringement and those direct acts of infringement are hidden or do not themselves

88. I and others have suggested as much in prior work as an independent rule on the scope of IP rights. See generally Peter Lee, *The Accession Insight and Patent Infringement Remedies*, 110 MICH. L. REV. 175 (2011) (proposing this approach in patent law); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989 (1997) (proposing this approach in copyright law).

89. See *supra* notes 86–87 and accompanying text.

generate revenue directly. One reason to favor a fruit of the poisonous tree rule might be to make sure certain IP owners can recover money.

I am somewhat nervous about this third justification because I think it is easy to abuse. There is no obvious “right” amount of money patentees should recover. It is just as plausible that patentees should not recover much money if the invention did not generate much money. Indeed, it may be an indication that most of the value resides in the defendant’s contribution, which as noted above is a factor that weighs against allocating downstream value to IP owners.

A related but conceptually distinct problem arises when direct infringement is committed by millions of end users, each of whom would be on the hook for a small amount of damages. Tim Holbrook has this concern with 3D printing,⁹⁰ and it arguably extends to other easy-to-replicate technologies like seeds or copyrighted works on the internet. This is not, strictly speaking, a fruit of the poisonous tree problem, because the downstream acts are themselves infringing. Moreover, in circumstances like 3D printing or the internet where a single copy begets others, we commonly hold the defendant liable for inducing that infringement by third parties, at least where they act intentionally to facilitate downstream infringement.⁹¹

Difficulty of detecting infringement, by contrast, makes a stronger case for enhancing remedies. Economic literature commonly suggests raising sanctions in cases where a significant percentage of wrongs go undetected and therefore unremedied.⁹² Other areas of civil law, like antitrust, do just that. But we should probably limit a compensatory justification for expanded remedies to responding to difficulty in detecting infringement, not to a perceived undercompensation when infringement is detected.

90. Timothy R. Holbrook, *Remedies for Digital Patent Infringements*, in 3D PRINTING, EMERGING TECHNOLOGIES, AND IP LAW (Mark A. Lemley & Dinusha Mendis eds., Elgar Press forthcoming 2018). Specifically, Holbrook argues that the producer of a CAD file that generates a product that infringes a design patent should be liable for downstream printing of the infringing design. *Id.*

91. See *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*, 545 U.S. 913, 919 (2005).

92. There is a robust debate on the literature as to whether deterrence is effective in criminal law. See, e.g., Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169, 207–09 (1968); Michael K. Block & Joseph Gregory Sidak, *The Cost of Antitrust Deterrence: Why Not Hang a Price Fixer Now and Then?*, 68 GEO. L.J. 1131, 1131–33 (1980); William J. Chambliss, *Types of Deviance and the Effectiveness of Legal Sanctions*, 1967 WIS. L. REV. 703, 703–04; Paul H. Robinson & John M. Darley, *Does Criminal Law Deter? A Behavioral Science Investigation*, 24 OXFORD J. LEGAL STUD. 173, 185–93 (2004). But IP law seems a more plausible candidate than most for deterrence, since monetary fines rather than prison are at stake, and companies should internalize the potential cost of enhanced damages. See John Collins Coffee, Jr., *Corporate Crime and Punishment: A Non-Chicago View of the Economics of Criminal Sanctions*, 17 AM. CRIM. L. REV. 419, 432 (1980) (arguing that fines deter businesses more effectively than incarceration); Richard A. Posner, *Optimal Sentences for White-Collar Criminals*, 17 AM. CRIM. L. REV. 409, 416 (1980) (same).

B. DO IP'S CURRENT RULES MAKE SENSE?

How do the various fruit of the poisonous tree doctrines in IP law stack up against these principles? To begin, the principles I outlined above may offer an explanation for the otherwise-surprising breadth of the fruit of the poisonous tree doctrine in trade secret law. As we saw in Part II, trade secret law applies the doctrine to a degree most other IP doctrines don't match. The characteristics of typical trade secret cases may help to explain why. Patent and design patent law are strict liability offenses. Defendants can—and generally do—infringe with no idea they are treading on the rights of another.⁹³ Trademark law considers intent, but it too can be, and often is, infringed innocently.⁹⁴ Copyright law requires copying, so copyright infringement is more likely to be intentional, but it requires no particular state of mind, and defendants have been held liable for unconscious copying or for copying works they had licensed in good faith from the wrong owner.⁹⁵ Trade secret law, by contrast, requires bad conduct with at least a negligent state of mind,⁹⁶ so it may be easier to deter than other kinds of IP infringement. Indeed, most misappropriation of trade secrets is done intentionally, though sometimes by departing employees who don't know that what they were taking was not permitted.

Further, misappropriation of trade secrets, like the secrets themselves, is usually concealed from public view. Most infringing uses of patents or copyrights are in public products, and designs and brands are necessarily public-facing. But misappropriated trade secrets may never see the light of day because they are intended to be used in internal processes rather than

93. Indeed, Cotropia and Lemley find that the overwhelming majority of patent cases are filed against people who are not even accused of copying. Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1459–60 (2009). And even the vast majority of findings of “willful” patent infringement are not based on any evidence that the defendant copied the invention. *Id.* at 1463.

94. Indeed, while evidence of intent to confuse can help drive a finding of likely confusion, and may even be the most important factor, Barton Beebe, *An Empirical Study of the Multifactor Tests for Trademark Infringement*, 94 CALIF. L. REV. 1581, 1608 (2006), evidence of a lack of intent to confuse not only doesn't avoid liability, but it doesn't even count in the defendant's favor. *Lucky's Detroit, LLC v. Double L, Inc.*, 533 F. App'x 553, 560 (6th Cir. 2013) (“Because ‘intent is an issue whose resolution may benefit only the cause of the senior user, not of an alleged infringer,’ the district court correctly determined that this factor was neutral.” (quoting *Leelanau Wine Cellars, Ltd. v. Black & Red, Inc.*, 502 F.3d 504, 520 (6th Cir. 2007))).

95. See, e.g., *Lipton v. Nature Co.*, 71 F.3d 464, 475 (2d Cir. 1995) (defendant was liable for copying a list onto a T-shirt, even though it paid a license in good faith to the party it believed was the author of the list); *Bright Tunes Music Corp. v. Harrisongs Music, Ltd.*, 420 F. Supp. 177, 180 (S.D.N.Y. 1976) (George Harrison's song “My Sweet Lord” subconsciously copied the Chiffons' song “He's So Fine”; intentional copying not required.).

96. See, e.g., *Bateman v. Mnemonics, Inc.*, 79 F.3d 1532, 1550 (11th Cir. 1996); RESTATEMENT (THIRD) UNFAIR COMPETITION LAW § 41 (AM. LAW INST. 1995) (requiring that the defendant “had reason to know” it was misappropriating a secret).

sold to the world.⁹⁷ After all, if they were sold to the world, they wouldn't likely be secret anymore.⁹⁸ As a result, it is harder to detect trade secret misappropriation than it is other types of IP infringement. And even when the misappropriation is done by departing employees who might reasonably be suspected of taking secrets with them, it is hard to tell whether they did and, if so, what use has been made of those secrets. Indeed, plaintiff-friendly theories like inevitable disclosure are based on that very inability to know whether the defendant is using the plaintiff's secret.⁹⁹ The result is that, while it is impossible to know for certain, it seems likely that trade secret theft goes undetected more than patent, trademark, or commercial copyright infringement.¹⁰⁰ Further, because trade secrets are more likely to be processes, not products, it may be harder to calculate damages if we do so based only on the use of the process itself.

These conditions are less likely to be present in other IP regimes. With a few notable exceptions, like copying of computer source code and using patented research tools, most infringers make public use of their products, making detection easier. And many patent, design patent, and trademark defendants are accused not of copying or of willfully infringing, but of simply adopting in good faith a technology, design, or brand that the law deems too similar to the plaintiff's.¹⁰¹ Thus, it makes sense for trade secret law, but not other IP regimes, to adopt the fruit of the poisonous tree rule as a default.

Other IP regimes should limit extension of IP rights beyond the scope of infringement to circumstances in which the defendant's infringement was willful and there is some reason to worry that it would not otherwise be

97. See, e.g., Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 STAN. L. REV. 311, 338–41 (2008); Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81, 104–18. There are, of course, counterexamples, including computer source code and the formula for Coca-Cola. But in general, trade secret protection tends to be directed towards processes and products that are not normally exposed to public view. Michael Risch, *Why Do We Have Trade Secrets?*, 11 MARQ. INTELL. PROP. L. REV. 1, 7–8 (2007).

98. See, e.g., MERGES, MENELL & LEMLEY, *supra* note 34, at II-31 to II-36 (documenting cases in which public disclosure destroys trade secret protection).

99. See generally, e.g., *Pepsico, Inc. v. Redmond*, 54 F.3d 1262 (7th Cir. 1995).

100. The commercial caveat is because the prevalence of copyright infringement by individuals on the internet means that some infringement will not be detected, not because it is hard to find, but because it gets lost in the crowd. See generally Mark A. Lemley & R. Anthony Reese, *Reducing Digital Copyright Infringement Without Restricting Innovation*, 56 STAN. L. REV. 1345 (2004). That said, automated takedown notices actually detect and shut down an enormous amount of copyright infringement today. Google has removed links to nearly two billion websites based on requests from copyright owners. See Justin Pot, *Google Delisted 1.75 Billion Websites Because of Copyright Takedown Requests*, TNW, https://thenextweb.com/google/2016/09/12/google-removed-1-75-billion-websites-copyright-takedown-requests/?utm_source=copypaste&utm_medium=referral&utm_content=Google%20delisted%201.75%20billion%20websites%20because%20of%20copyright%20takedown%20requests&utm_campaign=share%2Bbutton#.tnw_CbLafv8U (last visited Sept. 24, 2017).

101. *Cotropia & Lemley, supra* note 93, at 1441–42 (finding that between 90% and 99% of patent lawsuits outside the pharmaceutical industry were filed against defendants who were not even alleged to have obtained the invention from the plaintiff).

detected or remedied. Trademark law generally gets it right on this view. Design patent decidedly does not. Utility patent law may find some justification for reach-through royalties in upstream research tool cases from this approach, though it should probably rethink its willingness to apply the entire market value rule and conveyed sales in cases that involve neither willful infringement nor a reason to think infringement is unlikely to be detected very often.¹⁰² Copyright law's apportionment rules make sense under this test. Finally, my approach may offer some justification for the willingness every IP regime shows to punish willful conduct more severely—at least if willfulness is defined to mean knowing infringement.¹⁰³

Finally, every IP regime should limit application of the fruit of the poisonous tree doctrine in circumstances where the defendant's use added significant value beyond simply implementing or improving the plaintiff's IP. We do not want to shut down valuable inventions and creations like pharmaceuticals or computer programs because of how they were created. IP owners should get compensated for infringement, but they should not be able to lay claim to the defendant's creativity merely because their work was used to help create the defendant's work. Copyright law gets this right in part and wrong in part. It permits reverse engineering with the goal of generating non-infringing products, but it also takes creative derivative works away from their creators if those works incorporate material used unlawfully.¹⁰⁴ Patent law, by contrast, will allow a defendant to separately patent its own contribution, though it also threatens to block the use of that contribution through the doctrine of "blocking patents."¹⁰⁵

Application of the fruit of the poisonous tree doctrine is unwise when the defendant has made substantial contributions that do not merely take or adapt the plaintiff's work. IP owners should be able to recover for the value they contributed to the defendant's work, subject to an apportionment principle, but they should not be able to prevent the defendant from selling

102. Cf. Lemley, *supra* note 59 (criticizing excessive use of the entire market value rule); Brian J. Love, Note, *Patentee Overcompensation and the Entire Market Value Rule*, 60 STAN. L. REV. 263 (2007).

103. While willful infringement in copyright, trademark, and trade secret law is defined in this way, the situation in patent law is less clear. Patent law traditionally defined willfulness using an artificial construct under which independent inventors with no knowledge of the patent could become willful infringers once they were sued unless they obtained a written letter from counsel. See generally Mark A. Lemley & Ragesh K. Tangri, *Ending Patent Law's Willfulness Game*, 18 BERKELEY TECH. L.J. 1085 (2003). The Supreme Court recently redefined willfulness in patent cases. See generally *Halo Elec., Inc. v. Pulse Elec., Inc.*, 136 S. Ct. 1923 (2016). Its definition seems to have in mind intentional conduct. See generally Michael Feldman & Mark A. Lemley, *Characteristic of a Pirate: Willfulness and Treble Damages*, (Stanford Pub. Law Working Paper No. 2811773, 2016). But the Federal Circuit has applied preexisting definitions. See generally *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317 (Fed. Cir. 2016). In my view, enhanced damages for patent infringement should be limited to cases of copying of the invention, as they are in trademark, trade secret, and copyright law. See Lemley & Tangri, *supra*, at 1089.

104. See *supra* notes 70–78 and accompanying text.

105. Lemley, *supra* note 78, at 991–92, 1009–10.

the new work or to control all of it. Patent law has mostly gotten this right, at least since *eBay* eliminated automatic injunctions¹⁰⁶ and courts began taking apportionment seriously as a damages principle.¹⁰⁷ But copyright law needs to limit the control it gives over derivative works,¹⁰⁸ and design patent law, which has no apportionment principle at all, desperately needs one.¹⁰⁹ Even trade secret law, which is generally right to allow plaintiffs to exercise control over downstream works, should limit the reach of the fruit of the poisonous tree doctrine where the defendant's product or process is sufficiently changed from the misappropriated one.¹¹⁰

IV. CONCLUSION

All legal doctrines struggle with the limits of causation, and IP law is no exception. The current IP regimes apply the fruit of the poisonous tree doctrine with seemingly little rhyme or reason. By understanding when and why we might want to use such a doctrine, we can not only understand otherwise puzzling aspects of IP law, like head-start injunctions in trade secret law and reach-through royalties in patent law, but we can also identify legal rules that don't make much sense, like the failure to apportion design patent damages or the excessive control copyright law gives over derivative works.

106. See generally *eBay Inc. v. MercExchange L.L.C.*, 547 U.S. 388 (2006).

107. See *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014).

108. The rise of the transformative use doctrine in fair use has moved copyright law in the right direction here, by excusing many uses that would otherwise have triggered the fruit of the poisonous tree doctrine. See generally, e.g., *Authors Guild v. Google, Inc.*, 804 F.3d 202 (2d Cir. 2015) (applying transformative use doctrine to author copyright infringement case); *Bill Graham Archives v. Dorling Kindersley Ltd.*, 448 F.3d 605 (2d Cir. 2006) (applying transformative use doctrine in a poster copyright case); Pierre N. Leval, *Toward a Fair Use Standard*, 103 HARV. L. REV. 1105 (1990) (providing an overview of the interplay between the transformative use and the fair use doctrines).

109. See Lemley, *supra* note 49, at 232. The Supreme Court offered some hope in *Samsung Elecs. Co. v. Apple Inc.*, 137 S. Ct. 429 (2016), that the bad effects of the no-apportionment rule will be cabined, but it didn't offer much guidance.

110. Thus, I endorse Deepa Varadarajan's suggestion that trade secret law needs a fair use defense. See generally Deepa Varadarajan, *Trade Secret Fair Use*, 83 FORDHAM L. REV. 1401 (2014). She specifically recommends considering "the extent to which the defendant has improved upon the trade secret. Substantial improvement of trade secret information will weigh in favor of fair use." *Id.* at 1449.