
Article

Rethinking Technology Neutrality

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INTRODUCTION

Should laws be technology specific or technology neutral? That is, should laws be drawn narrowly to specific technologies or broadly to general characteristics? Scholars and legislators have overwhelmingly adopted the latter mode—“technology neutrality”—based on the assumption it promotes statutory longevity and equal treatment of old and new technologies. But technology neutrality suffers from inherent flaws that undermine its ability to achieve these policy goals. Neutrality, it turns out, is both suboptimal and often self-defeating. It is also not neutral.

Four fraught decades in copyright law, during which technology neutrality was supposed to mitigate a perennial struggle of adapting copyright to new communications technologies, reveal fundamental failings. With the 1976 Copyright Act,¹ a Congress weary of recurring demands to revise copyright law in light of new technologies—e.g., phonographs, film, radio, cable

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1. Pub. L. No. 94-553, 90 Stat. 2541 (1976) (codified as amended in scattered sections of 17 U.S.C.).

transmission, etc.—thought it had guarded the statute against ossification and obsolescence via technology-neutral defaults. These defaults appear in the 1976 Act’s provisions on subject matter,² rights,³ and statutory definitions.⁴ Copyright control was thus supposed to turn on relevant circumstances, not technicalities. That is, with the exception of numerous technology-specific carveouts,⁵ copyright’s subject matter and scope would apply broadly and evenly to all technologies, even those that did not exist. Copyright law would be technology neutral.

Yet, disputes continue. Recently, the U.S. Supreme Court was asked to determine whether a retransmission company, Aereo, violated copyright law by trying to invent around the broadcasters’ public performance rights.⁶ *American Broadcasting Companies, Inc. v. Aereo, Inc.* was the twelfth Supreme Court copyright case arising from a dispute over a new technology or new use of an existing technology;⁷ technology-driven cases have constituted twenty percent of the Court’s substantive copyright docket since 1978.⁸

2. 17 U.S.C. § 102 (2012).

3. *Id.* § 106.

4. *Id.* § 101.

5. For a discussion of some of the many technology-specific provisions that are the exceptions to the Copyright Act’s technology-neutral defaults and that have increased over time, see *infra* Part I.B.

6. *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498 (2014).

7. See generally *MGM Studios, Inc. v. Grokster, Ltd.*, 545 U.S. 913 (2005) (peer-to-peer file sharing); *N.Y. Times Co. v. Tasini*, 533 U.S. 483 (2001) (electronic reproductions); *Lotus Dev. Corp. v. Borland Int’l, Inc.*, 516 U.S. 233 (1996) (software); *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984) (home video recorders); *Williams & Wilkins Co. v. United States*, 420 U.S. 376 (1975) (photocopying); *Teleprompter Corp. v. Columbia Broad. Sys., Inc.*, 415 U.S. 394 (1974) (cable retransmission); *Fortnightly Corp. v. United Artists Television*, 392 U.S. 390 (1968) (same); *Mazer v. Stein*, 347 U.S. 201 (1954) (applied art); *Buck v. Jewell-La Salle Realty Co.*, 283 U.S. 191 (1931) (radio); *Kalem Co. v. Harper Bros.*, 222 U.S. 55 (1911) (motion picture version of novel *Ben Hur*); *White-Smith Music Publ’g Co. v. Apollo Co.*, 209 U.S. 1 (1908) (player piano rolls); *Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53 (1884) (photographs). Although *Mazer* is not typically thought of as a new technology case, it is relevant because it involved a new use of an existing technology.

8. I set January 1, 1978, as the cutoff because that is when the 1976 Copyright Act took effect. This also excludes any case that did not arise primarily as a copyright dispute. See *Dastar Corp. v. Twentieth Century Fox Film Corp.*, 539 U.S. 23 (2003); *Dowling v. United States*, 473 U.S. 207 (1985); *Broad. Music, Inc. v. Columbia Broad. Sys., Inc.*, 441 U.S. 1 (1979). Of the Court’s twenty copyright cases, four were primarily driven by new technologies.

The need to adapt to new technologies remains the primary impetus for copyright revision. The 1976 Act, like its predecessors, began to feel antiquated shortly after its enactment—“a good 1950 copyright law,” in the words of the statute’s principle drafter, former Register of Copyrights Barbara Ringer.⁹ Technology-neutral provisions have failed to future-proof copyright law, leading to numerous quickly outmoded revisions. Neutral provisions also have magnified copyright’s complexity by driving judicial inconsistency and increasing the role of uncertain *ex post* exceptions. And, repeatedly, technology-neutral provisions have been neutral in theory, but technology-specific in practice; by focusing on design,¹⁰ judges have reached contrary results across technologies that are similar in technological output but distinct in design, process, or construct.¹¹ Moreover, the 1976 Act’s technology-neutral defaults were drafted with existing technologies (and business models) in mind, resulting in inefficient and unjustified discrimination against new technologies.

Surprisingly, scholars have not questioned the expedience of technology neutrality as embodied by the 1976 Copyright Act. With the review process ongoing for possibly the fifth major overhaul of copyright law,¹² copyright scholars, at conferences and before Congress, have highlighted numerous areas of the law that they think are in greatest need of reform.¹³ Yet,

9. Barbara Ringer, *Authors’ Rights in the Electronic Age: Beyond the Copyright Act of 1976*, 1 LOY. L.A. ENT. L. REV. 1, 4 (1981); see also *id.* (“[S]ome of its inadequacies are already becoming apparent, and no prophet is needed to foretell the need for substantial restructuring of our copyright system before the end of this century.”).

10. And, in this sense, adopting the formalistic approach of *White-Smith Music Publ’g Co.*, 209 U.S. at 1.

11. In other words, judges apply different doctrines to different technologies that do the same thing because the technologies use different means to achieve the same end. See, e.g., *infra* notes 208–25 and accompanying text (discussing the three big peer-to-peer file-sharing cases from the early aughts).

12. See *The Scope of Copyright Protection: Hearing Before the Subcomm. on Courts, Intellectual Prop., & the Internet of the H. Comm. on the Judiciary*, 113th Cong. (2014); see also Maria A. Pallante, *The Next Great Copyright Act*, 36 COLUM. J.L. & ARTS 315 (2013) (an extended version of the Twenty-Sixth Horace S. Manges Lecture delivered on March 4, 2013, at Columbia Law School, in which the Register of Copyrights called on Congress to review and revise the copyright law). Four previous major revisions were implemented by the 1831, 1870, 1909, and 1976 copyright statutes.

13. Among other issues, statutory damages, notice and takedown, orphan works, music licensing, the scope of rights, formalities, and copyright limitations have received significant attention. See, e.g., *Congressional Hearings on the Review of the Copyright Law*, U.S. COPYRIGHT OFF., <http://copyright>

despite generally broad recognition that copyright law remains poorly tailored to new technologies, scholars have not searched Congress's rationale for adopting technology-neutral provisions in copyright nor asked whether and when neutrality is desirable or even achievable.

This Article offers a novel critique of technology neutrality. It starts from the premise that technology neutrality is undertheorized and, thereby, poorly understood. While scholars frequently refer vaguely to the principle, few have conceptualized it, and legislators have adopted it without critical inquiry. This Article challenges the utility of technology neutrality by positing four overlooked flaws: (1) the problem of prediction; (2) the problem of the penumbra; (3) the problem of perspective; and (4) the problem of pretense. Together, these problems demonstrate that technology neutrality is both suboptimal and often self-defeating—the very features that are said to animate its virtues also expose vices that impede the ability to achieve stated policy goals. In contrast, technological discrimination sometimes enhances social welfare.

First, this Article introduces technology neutrality's *problem of prediction*. That is, legislators often cannot adequately predict whether and to what extent a law should regulate a new technology until that technology is known. Because laws drafted to account for unforeseen technologies are, in fact, drawn with known technologies in mind, they are prone to poor tailoring. These predictive limitations undermine technology neutrality's ability to future-proof laws against paradigm-shifting technologies and mistake equal application for equivalence. The emergence of the Internet offers a poignant illustration of this tension in the 1976 Copyright Act.

Second, and relatedly, this Article explains how technology neutrality amplifies a general challenge of jurisprudence—the *problem of the penumbra*—and how this leads to under- and over-inclusiveness. Legal theorists like H.L.A. Hart long have recognized the limitations in tailoring a law to unforeseen circumstances.¹⁴ Yet, surprisingly, these understandings have not colored the principle of technology neutrality, which is undermined by an enlarging penumbra of uncertainty. Moreover,

.gov/laws/hearings (last visited Mar. 17, 2015); Patrick Goold, *The Next Great Copyright Act—A Conference Recap*, TECH. ACAD. POL'Y (May 2, 2014), <http://www.techpolicy.com/Blog/May-2014/Next-Great-Copyright-Act—A-Conference-Recap,-The.aspx>.

14. See *infra* notes 145–48 and accompanying text.

with time it becomes less clear that the law should apply, and because the 1976 Act uses broad terms that are per se inclusive of new technologies, courts have responded by expanding the availability of use-specific exceptions to copyright liability. In particular, fair use has taken on an outsized role. That, in turn, has increased uncertainty about how the law actually will be applied.

Third, this Article explores the *problem of perspective* in copyright law that misguides technology-neutral inquiries. Even assuming that technology neutrality is desirable, its implementation is hampered by judges choosing between a behavioral perspective and a structural perspective in infringement inquiries. The former focuses on the technological output, the use facilitated by the technology; the latter looks inside the machine at the design or process that enables the use. Numerous examples from recent decades show that the locus of inquiry often is determinative, with variations leading to inconsistent application of copyright law.¹⁵

And, fourth, this Article discusses the *problem of pre-tense*—that technology neutrality is not, in fact, neutral. To begin, legislative and interpretive processes are shaped by social and political contexts. Merely determining the technologies to which the law should be applied neutrally is based on value judgments that reflect different beliefs about the law's role in protecting authors or enabling technology. Moreover, ex ante inclusion of unforeseen technologies increases the likelihood that the law will discriminate against future technologies by not accounting for new uses that disturb the policies Congress previously balanced.

This conceptual rethinking reveals fundamental flaws with the ex ante application of law to future technologies. Technolo-

15. Yet the problem of perspective has a much longer history in copyright law. Part II.C focuses specifically on *Aereo* and peer-to-peer file-sharing. But other examples exist, such as video game derivative works. Compare *Lewis Galoob Toys, Inc. v. Nintendo of Am. Inc.*, 964 F.2d 965, 967–68 (9th Cir. 1992) (finding that the plaintiff's Game Genie, which enabled users to alter Nintendo video games while the game was in use, did not infringe Nintendo's copyrights because the "altered displays do not incorporate a portion of a copyrighted work in some concrete or permanent form," and the changes do not exist independent of the Nintendo console), with *Midway Mfg. Co. v. Artic Int'l, Inc.*, 704 F.2d 1009, 1013–14 (7th Cir. 1983) (finding that read-only memory chips that replaced a video game manufacturer's circuit boards and increased rate of game play infringed the plaintiff's copyrights by creating derivative works). For further discussion, see Brad A. Greenberg, *Judging New Technologies* (Aug. 27, 2015) (unpublished manuscript) (on file with author).

gy neutrality is not per se harmful or inefficient. But to achieve the perceived benefits of technology neutrality, lawmakers must properly discriminate among different technologies; to be substantively technology neutral, a statute must be specific about the technologies to which it will be neutrally applied.

Conversely, technology specificity has unappreciated benefits. By embracing the need for more frequent updates, technology-specific laws can be drafted more carefully than technology-neutral laws and be coupled with judicial tools and regulatory processes that help technology-specific laws achieve the policy goals of technology neutrality, and without the costs. Integral, though, is congressional recognition that other institutions—courts and agencies—are needed to help adapt the law to technological change.

In short, this Article argues that technological discrimination, a combination of neutrality and specificity, can better serve broader copyright and innovation policy goals by improving legal tailoring, reducing legal uncertainty, limiting efforts to exploit statutory ambiguity, and better balancing flexibility for technologists with compensation for copyright owners. At the same time, it can increase statutory longevity and promote treating like technologies alike.

One path forward, outlined here, involves reshaping copyright law around a broadly defined exclusive right that reaches only covered technologies. The law's scope is initially set by Congress and serves as a guide for the judiciary and an agency applying the law to new technologies. This proposal does not completely abandon the concept of neutrality, but pushes the law toward greater technology specificity. The statute would be drafted to technologies within specific domains (e.g., a handheld device, substantively equivalent to a pen or pencil, for writing), and the law would then be applied to new technologies that fit within those domains. To ensure that unforeseen technologies do not deplete the value of copyrights, the agency would issue rules regarding whether a new technology is within the statute's covered technologies and would set compulsory licenses for uncovered technologies. This would amend legal defaults that grant authors control over new technologies without swinging the pendulum back to no-control. A compulsory license regime for unforeseen technologies provides an equitable backstop for the copyright system.

This proposal implicitly embraces technology exceptionalism—the position that new technologies often de-

mand new legal rules. This claim is familiar from the cyberlaw debate of recent years. Cyberlaw advocates, as technology exceptionalists, argued that the Internet is special and thus requires special legal tools.¹⁶ Skeptics, on the other hand, argued that the Internet is merely a focal point for the study of numerous already established areas of law (e.g., tort, contract, criminal procedure); cyberlaw, as Judge Easterbrook famously remarked, is nothing more than “law of the horse.”¹⁷ This Article moves beyond the basic premise of technology exceptionalism to show how copyright law has repeatedly struggled when it has attempted to treat different technologies alike.

This Article proceeds as follows. Part I sketches copyright’s repeated conflicts with new technologies and introduces the promises of technology neutrality generally and as embodied in the 1976 Act specifically. Part II then deconstructs technology neutrality. It exposes four overlooked problems—prediction, the penumbra, perspective, and pretense—and discusses the force in each major copyright content-technology conflict of the past four decades. Finally, Part III argues that technological discrimination can be socially beneficial and offers a more technology-specific alternative for achieving technology-neutral goals, showing how this would have affected the outcome in *Aereo* and would have created greater clarity as to copyright liability for cloud-computing technologies generally. This Article concludes with a brief discussion of the implications of this rethinking for other technology-neutral legal regimes, such as electronic signatures, surveillance, and telecommunications, with a focus on patent law.

16. See, e.g., Dan Hunter, *Cyberspace as Place and the Tragedy of the Digital Anticommons*, 91 CALIF. L. REV. 439, 518 (2003) (“The cyberspace enclosure movement threatens to reverse this process by forcing our physical property assumptions on the online environment where they are unnecessary, harmful, and wrong.”); Lawrence Lessig, *The Law of the Horse: What Cyberlaw Might Teach*, 113 HARV. L. REV. 501 (1999); Jonathan Zittrain, *Internet Points of Control*, 44 B.C. L. REV. 653 (2003) (arguing that control will trump anarchy on the Internet by examining Pennsylvania’s recent attempts to restrict internet access to illegal pornography).

17. Frank H. Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. CHI. LEGAL F. 207, 208.

I. TECHNOLOGY NEUTRALITY'S PROMISE

A. COPYRIGHT AND NEW TECHNOLOGIES

Modern copyright law's existence can be traced to a transcendent technology: the movable-type printing press. In an effort to control the information that could be shared with the masses, governments restricted who could licitly print and control the publication of certain writings.¹⁸ Subsequent technological and social changes led to Britain's 1710 Statute of Anne, the matriarch of copyright law.¹⁹ Unlike the printing privileges that preceded it, copyright law offered the dream of artistic riches to anyone who authored a copyrightable work.²⁰

Copyright encourages authorship through incentives, primarily the promise of control over a work and its commercialization.²¹ In the interest of "promot[ing] the Progress of Science and useful Arts," the U.S. Constitution authorizes Congress to provide authors with exclusive rights over the use of their creative works.²² Copyright law's subject matter and scope have expanded dramatically since the first statute was enacted in 1790;²³ protection now subsists in any original work of author-

18. EATON DRONE, A TREATISE ON THE LAW OF PROPERTY IN INTELLECTUAL PRODUCTIONS IN GREAT BRITAIN AND THE UNITED STATES 54–59 (1879); BENJAMIN KAPLAN, AN UNHURRIED VIEW OF COPYRIGHT 3–7 (1967).

19. Statute of Anne 1710, 8 Ann. c. 19, http://avalon.law.yale.edu/18th_century/anne_1710.asp. See generally Diane Leenheer Zimmerman, *The Statute of Anne and Its Progeny: Variations Without a Theme*, 47 HOUS. L. REV. 965 (2010) (examining the origins of copyright and subsequent development).

20. But see Jane C. Ginsburg, *The U.S. Experience with Mandatory Copyright Formalities: A Love/Hate Relationship*, 33 COLUM. J.L. & ARTS 311, 319 (2010) (discussing the Statute of Anne's stringent formalities). Copyright law also nurtured a free-speech culture by removing government licensing from the publishing business. See Edward Lee, *Freedom of the Press 2.0*, 42 GA. L. REV. 309, 316 (2008); Neil Weinstock Netanel, *Copyright and a Democratic Civil Society*, 106 YALE L.J. 283, 335–36 (1996) (discussing the incentives created by a democratic paradigm of copyright).

21. See generally WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* (2003) (presenting an economic analysis focusing on copyright law).

22. U.S. CONST. art. I, § 8, cl. 8. In the Progress Clause, also called the Intellectual Property Clause, "Science" refers to the province of copyright and "useful Arts" to patent.

23. See Act of May 31, 1790, ch. 15, § 3, 1 Stat. 124 (amended 1802) ("[F]or the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies, during the times therein mentioned."). For a discussion of copyright's growth, see generally Neil W. Netanel, *Why Has Copyright Expanded? Analysis and Critique*, in 6 NEW DIRECTIONS IN COPYRIGHT LAW (Fiona Macmillan ed., 2007) (arguing that copy-

ship fixed in a tangible medium and grants the copyright owner exclusive rights over, *inter alia*, reproduction, distribution, adaptation, and performance.²⁴

The dominant theory for U.S. intellectual property law is utilitarianism—copyright is the chosen means to a principled end.²⁵ The framers intended to promote cultural progress and knowledge transfer by providing authors with the “economic incentive to create and disseminate ideas.”²⁶ Under this theory, the Supreme Court has indicated that authors ought to benefit from their labors, but whether they actually do so is ancillary to the public benefit reaped by an author’s motivation to create an original work.²⁷

In copyright’s story, technology has played the part of both hero and villain.²⁸ Technology has promoted copyright values by

right content industries have successfully lobbied Congress with interests not necessarily shared by the public).

24. 17 U.S.C. §§ 102(a), 106 (2012).

25. See William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 J. LEGAL STUD. 325, 326 (1989) (discussing the extent to which copyright law can be explained as a means for efficient allocation of resources); see also ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 115 (5th ed. 2008) (“The utilitarian approach makes a person’s claim to property tentative. It can be taken from him in principle if the beneficiaries of the expropriation gain more in utility than the owner loses.”); Abraham Bell & Gideon Parchomovsky, *A Theory of Property*, 90 CORNELL L. REV. 531, 547 (2005) (“[T]here is widespread agreement that the law orders property in response to societal needs, rather than in obedience to a moral command or the natural order of the universe.”).

26. *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 558 (1985); see also *Eldred v. Ashcroft*, 537 U.S. 186, 219 (2003) (noting that copyright established “a marketable right to the use of one’s expression”); *Mills Music, Inc. v. Snyder*, 469 U.S. 153, 187 (1985) (White, J., dissenting) (“Achieving that fundamental objective of the copyright laws requires providing incentives both to the creation of works of art and to their dissemination.”).

27. See *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 477 (1984) (Blackmun, J., dissenting) (discussing the fair use doctrine); *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975) (“[P]rivate motivation must ultimately serve the cause of promoting availability . . .”).

28. See generally REGISTER OF COPYRIGHTS, REGISTER’S REPORT ON THE GENERAL REVISION OF THE U.S. COPYRIGHT LAW IX (1961) (“[T]echnical advances have brought in new industries and new methods for the reproduction and dissemination of the . . . works that comprise the subject matter of copyright.”); PAUL GOLDSTEIN, *COPYRIGHT’S HIGHWAY: FROM GUTENBERG TO THE CELESTIAL JUKEBOX* (2003); LAWRENCE LESSIG, *FREE CULTURE: HOW BIG MEDIA USES TECHNOLOGY AND THE LAW TO LOCK DOWN CULTURE AND CONTROL CREATIVITY* (2004); Clark D. Asay, *Copyright’s Technological Interdependencies*, 18 STAN. TECH. L. REV. 189 (2015); Anupam Chander, *How Law Made Silicon Valley*, 63 EMORY L.J. 639 (2014); Ben Depoorter, *Technology and Uncertainty: The Shaping Effect on Copyright Law*, 157 U. PA. L. REV.

increasing both the quantity of and access to copyrightable works—providing new mediums of expression, and in the process new types of authorship,²⁹ as well as facilitating geometric growth in the quantity of creative expression. New technologies also have dramatically expanded modes of reproduction and dissemination, thereby increasing access to copyrighted works. Novel mediums and modes have opened new markets for commercializing copyrighted works. But technology also has undermined copyright incentives by supplanting existing markets for such works,³⁰ facilitating large-scale infringement,³¹ and threatening to make existing law obsolete.³² New technologies both increase the uses that consumers can make of copyrighted works³³ and, in tandem, may provide content owners with new technological means to limit uses.³⁴ At the same time, copyright

1831 (2009); Dr. Mihály Ficsor, *Copyright for the Digital Era: The WIPO “Internet” Treaties*, 21 COLUM.-VLA J.L. & ARTS 197 (1997); Jane C. Ginsburg, *Copyright and Control over New Technologies of Dissemination*, 101 COLUM. L. REV. 1613 (2001); Jessica D. Litman, *Copyright Legislation and Technological Change*, 68 OR. L. REV. 275 (1989); Robert P. Merges, *One Hundred Years of Solicitude: Intellectual Property Law, 1900–2000*, 88 CALIF. L. REV. 2187 (2000); Harry Surden, *Technological Cost as Law in Intellectual Property*, 27 HARV. J.L. & TECH. 135 (2013); Timothy Wu, *Copyright’s Communications Policy*, 103 MICH. L. REV. 278 (2003).

29. For example, the invention of motion picture camera technology created a new possible medium of expressive work, the motion picture, or film.

30. See Ginsburg, *supra* note 28, at 1631.

31. See *MGM Studios, Inc. v. Grokster, Ltd.*, 518 F. Supp. 2d 1197, 1217 (C.D. Cal. 2007) (noting “undisputed evidence at summary judgment of massive end-user infringement”); *In re Aimster Copyright Litig.*, 252 F. Supp. 2d 634, 638 (N.D. Ill. 2002) (stating that Aimster’s “very *raison d’être* appears to be the facilitation of and contribution to copyright infringement on a massive scale”); Annemarie Bridy, *Is Online Copyright Enforcement Scalable?*, 13 VAND. J. ENT. & TECH. L. 695 (2011) (examining the contemporary problems with copyright enforcement through the lens of scalability).

32. New technology does not per se result in conflict with copyright law. As Peter DiCola and Matthew Sag note: “No significant upheaval arises in those rare instances when content owners are also the inventors of a new copyright technology [such as DVD encryption technology].” Peter DiCola & Matthew Sag, *An Information-Gathering Approach to Copyright Policy*, 34 CARDOZO L. REV. 173, 179 (2012). Conflict, though, is common and frequent.

33. See Jessica Litman, *Lawful Personal Use*, 85 TEX. L. REV. 1871, 1909 (2007) (“Supporters of copyright enhancements maintain that copyright owners need broader rights because technology has both enabled new and exciting ways of dissemination and chipped away at their control of their works.”).

34. Beyond technological protection measures, the digital age also has changed the way consumers experience copyrighted works. See generally NICHOLAS NEGROPONTE, *BEING DIGITAL* (1995); Jane C. Ginsburg, *From Having Copies to Experiencing Works: The Development of an Access Right in U.S. Copyright Law*, in U.S. INTELLECTUAL PROPERTY: LAW AND POLICY 39 (Hugh

law exerts substantial influence over which new technologies, particularly those facilitating new forms of distribution, will be permitted to enter a market.³⁵

These dynamics frequently result in conflicts between copyright content owners and technologists whose innovations make unauthorized uses of the copyrighted content.³⁶ An early example gives some shape to this push-and-pull relationship. In the late 1800s, long before copyright protected sound recordings, it attached to sheet music—and the music business was good. Then along came the gramophone and the player piano, technological innovations that enabled even the instrumentally ignorant to fill a home with the beauty of Beethoven and Bach. These machines also played copyrighted musical compositions that had been captured on records and perforated music rolls, respectively, which were manufactured and sold without the copyright owners' permission or compensation. Music publishers sued, and the U.S. Supreme Court held that piano rolls (and, by implication, records) were non-infringing because they were not human readable—and thus were unlike sheet music—and also because the relevant copyright statute did not speak to such technology.³⁷ After losing in court, composers took their fight to Congress, which quickly moved to include in the 1909

C. Hansen ed., 2000). The consumer market for copyrighted works has transformed from one of purchasing copies to one of purchasing licenses that limit permissible uses. See Aaron Perzanowski & Jason Schultz, *Reconciling Intellectual and Personal Property*, 90 NOTRE DAME L. REV. 1211, 1235–37 (2015).

35. See, e.g., Randal C. Picker, *Copyright as Entry Policy: The Case of Digital Distribution*, 47 ANTITRUST BULL. 423 (2002); Wu, *supra* note 28. Similar regulatory limitations to market entrants are seen in non-copyright fields, too. See, e.g., Ryan Calo, *Your Request To Innovate Has Been Denied*, FORBES (Apr. 14, 2014, 10:30 AM), http://cached.newslookup.com/cached.php?ref_id=293&siteid=2235&id=5632623&t=1397485800 (discussing ride-sharing startups that challenge taxicabs and a legal recruiting website that cuts out the headhunter, and noting that “[i]n each case, a new market entrant had to ask permission of some power to innovate, and that power imposed limits”). Limiting market competitors, in turn, can hamper innovation. See Tim Wu, *Intellectual Property, Innovation, and Decentralized Decisions*, 92 VA. L. REV. 123, 125–26 (2006) (“[T]he broad Edison patent slowed down progress . . .” (quoting Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 885–88 (1990))).

36. See Randal C. Picker, *The Yin and Yang of Copyright and Technology*, 55 COMM. ACM 30 (Jan. 2012), <http://cacm.acm.org/magazines/2012/1/144807-the-yin-and-yang-of-copyright-and-technology/fulltext> (“New waves of technology have created novel expressive opportunities and dramatic improvements in the ability to distribute copyrighted works. But new technology rarely asks permission, and with each technical advance, we have seen new opportunities and new clashes.”).

37. *White-Smith Music Publ'g Co. v. Apollo Co.*, 209 U.S. 1 (1908).

Copyright Act provisions extending the definition of “copy” to machine-readable copies and establishing a compulsory licensing regime for sheet music embodied in a record or perforated roll.³⁸

A much more recent content-technology conflict, to which I return throughout this Article, involved television broadcasters and an Internet-based broadcast delivery service. Aereo leased to subscribers a personal antenna that captured over-the-air television, copied and digitized the signal, and then sent it into the subscriber’s home over the Internet in near-real-time or later at the subscriber’s desire.³⁹ Television broadcasters sued, claiming that Aereo infringed Section 106(4) of the 1976 Copyright Act by making unlicensed transmissions.⁴⁰ Aereo argued that its transmissions were not public, and therefore did not infringe the public performance right in Section 106(4), because every transmission occurred on a one-to-one basis—one antenna to make one copy that could only be accessed by one subscriber. The dispute moved through the courts at a blistering pace; barely two years after the lawsuit was filed in the Southern District of New York,⁴¹ the Supreme Court held that Aereo’s technology did not absolve it of copyright liability. Aereo’s transmissions were treated as public performances and thus infringed the broadcasters’ public performance rights.⁴² The same day, Aereo waved the white flag.⁴³

38. The compulsory license was effectuated by the 1909 Copyright Act, which also created an exemption for coin-operated machines (i.e., jukeboxes). Copyright Act of 1909, ch. 320, 35 Stat. 1075 (superseded by 1976 Copyright Act, Pub. L. No. 94-553, 90 Stat. 2541).

39. The “live” transmission is delayed a few seconds.

40. *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498, 2503–04 (2014).

41. Complaint, *Am. Broad. Cos. v. Aereo, Inc.*, No. 12CV01540 (S.D.N.Y. Mar. 1, 2012), 2012 WL 676194.

42. *Aereo*, 134 S. Ct. at 2511.

43. See Victor Luckerson, *Aereo Backer Barry Diller: “It’s Over Now,”* TIME (June 25, 2014), <http://time.com/2921376/aereo-barry-diller>. Shortly thereafter Aereo attempted to avail itself of the Section 111 statutory license, though during litigation both the broadcasters and Aereo had stated that Aereo was ineligible. See Joint Letter to Judge Alison J. Nathan, *Aereo*, 2012 WL 676194; see also *US Copyright Office Says Aereo Not a Cable Company Under Terms of Copyright Act*, CNBC (July 17, 2014, 9:51 AM), <http://www.cnbc.com/id/101838646>. Aereo later filed for bankruptcy and settled with broadcasters for \$950,000. See Erik Larson, *Aereo Settles Broadcasters’ Claims for Penny on the Dollar*, BLOOMBERG BUS. (Apr. 21, 2015, 9:16 AM), <http://www.bloomberg.com/news/articles/2015-04-21/aereo-settles-broadcasters-copyright-claims-for-950-000>; Emily Steel, *Aereo Concedes Defeat and Files for Bankruptcy*, N.Y. TIMES (Nov. 21, 2014), <http://www.nytimes.com/2014/11/22/business/aereo-files-for-bankruptcy.html>. However, a district court in a re-

Such content-technology conflicts have historically traveled along one of three paths. For some new technologies copyright is held inapplicable, thus squelching liability, but Congress responds by amending the law to include that technology (e.g., player pianos, cable transmission, audio home recording devices). For other technologies, copyright law governs the technology's use of copyrighted content, and private ordering ensues (e.g., radio, film adaptations) or the technology disappears (e.g., Aereo, DVD copying). For yet another group of technologies, copyright is deemed applicable, but the technology's otherwise infringing use of copyrighted content is subject to an exception or exemption (e.g., photocopiers, VCRs, Internet search engines).

The arguments of opposing parties are fairly predictable in these conflicts. Rooted in distinct understandings of copyright's utilitarian purpose, each party's argument follows a general formula that puts author incentives and technological innovation at diametrically opposed poles.⁴⁴ On the one hand, content owners generally argue that excluding new technologies or exempting new uses harms copyright markets, which, in turn, undermines certainty regarding *ex ante* incentives. Key to this contention is that the author of a copyrighted work receives exclusive control over exploiting known *and* potential markets.⁴⁵ Though a potential market that arises only after the emergence of a new technology, if not reasonably foreseeable, could not have explicitly motivated an author *ex ante* and would represent a windfall, such markets are within copyright's constitutionally authorized incentive system.⁴⁶

lated case ruled that an Aereo competitor, providing functionally the same service, is entitled to the statutory license. *Fox Television Stations, Inc. v. AereoKiller*, 115 F. Supp. 3d 1152 (C.D. Cal. 2015).

44. An interesting case study is that of Sony Corporation, the producer of the personal videocassette recorders that once allegedly posed an existential threat to Hollywood. After defeating the claim that its technology infringed copyright, Sony became a major content producer through newly developed film and music studio divisions. See JAMES LARDNER, *FAST FORWARD: HOLLYWOOD, THE JAPANESE AND THE ONSLAUGHT OF THE VCR* 21–36 (1987).

45. See *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 568 (1985); see also Brad A. Greenberg, *Copyright Trolls and Presumptively Fair Uses*, 85 U. COLO. L. REV. 53, 98 (2014) (“Even if copyright owners choose not to actively license a work, or intentionally withhold licensing because they do not want the work to find an audience or be altered, courts have held that an infringing use likely harms a market that the copyright owners *could* exploit.”).

46. *Eldred v. Ashcroft*, 537 U.S. 186, 215 (2003) (suggesting that Congress's long pattern of extending copyright's duration and its coverage to new

The developers of new technologies, on the other hand, argue that subjecting the new use or distribution tool to copyright liability will threaten innovation.⁴⁷ Though it is unclear what role copyright should play in innovation policy—promote technological innovation, avoid hindering it, or just refuse to treat it differently than other allegedly infringing activities—technologists’ concerns relate to potential liability hindering technological development or enjoining products already to market.⁴⁸ In short: “[c]opyright can kill technology.”⁴⁹

Generally, it is difficult to know what technologies might have been but never were.⁵⁰ Like a dispute that settles before a lawsuit is filed, identifying research and development halted before news of any project is released can be elusive. But Michael Carrier’s research suggests that potential copyright lia-

technologies could motivate authorship by creating expectation of future expansion); see also Ginsburg, *supra* note 28, at 1619–21. Some have questioned this approach, most emphatically in the context of the Copyright Term Extension Act, which retroactively extended copyright duration twenty years for works already in existence. See, e.g., *Eldred*, 537 U.S. at 254–63 (Breyer, J., dissenting) (“[N]o one could reasonably conclude that copyright’s traditional economic rationale applies here. The extension will not act as an economic spur encouraging authors to create new works.”); see also Shyamkrishna Balganesh, *Foreseeability and Copyright Incentives*, 122 HARV. L. REV. 1569 (2009) (discussing the social costs of granting new-market windfalls to copyright owners). The term extension was seen as a gift to entertainment companies, which had valuable properties from the 1920s and 1930s, and was derisively known as “The Mickey Mouse Protection Act.” See Lawrence Lessig, *Copyright’s First Amendment*, 48 UCLA L. REV. 1057, 1065 (2001).

47. For a succinct discussion of these tradeoffs, seen most clearly with secondary liability doctrines and the DMCA’s safe harbor, see Randal C. Picker, *Copyright and Technology: Déjà Vu All Over Again*, 2013 WIS. L. REV. ONLINE 41; see also Ginsburg, *supra* note 28; Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1084 (1997) (arguing that patent law more effectively promotes innovation because of doctrines balancing the rights of inventors with improvers that are absent in copyright law).

48. See Gaia Bernstein, *In the Shadow of Innovation*, 31 CARDOZO L. REV. 2257 (2010); Mark A. Lemley & R. Anthony Reese, *Reducing Digital Copyright Infringement Without Restricting Innovation*, 56 STAN. L. REV. 1345, 1386–90 (2004); Robert Hof, “Ten Years of Chilled Innovation,” BLOOMBERG BUS. (June 28, 2005) (on file with the *Minnesota Law Review*) (interview with Lawrence Lessig in which he says that in Silicon Valley, following the Supreme Court’s *Grokster* decision, “already money has shifted into places which will avoid any conflict with the copyright holders”).

49. Picker, *supra* note 47, at 41.

50. A snapshot, though, comes from Michael Carrier, who cataloged numerous abandoned technologies by interviewing founders and executives from technology companies, the recording industry, and venture capital firms. Michael A. Carrier, *Copyright and Innovation: The Untold Story*, 2012 WIS. L. REV. 891.

bility increases *ex ante* caution.⁵¹ From a welfare standpoint, such a chill on technological development before the technology's capabilities could be known would raise policy concerns because a technology's commercial viability and social utility are exceptionally difficult to predict.⁵² Frequently, technologies are developed for one purpose but subsequently acquire greater meaning in an unforeseen area.⁵³ For example, Alexander Graham Bell struggled to convince consumers that his telephone would be useful for more than broadcasting the day's news⁵⁴ and Thomas Edison thought his phonograph would be used mostly to record deathbed testaments.⁵⁵ Both men were legendary inventors, but neither realized their creations' potential. If, for example, Bell gave up development of the telephone or its network because broadcasting news would have implicated copyright law, society would have lost a valuable new technology.⁵⁶ And because innovation is iterative, many subsequent technologies might never have come into being.

Conversely, some new communication technologies fit the model of player pianos and videocassette recorders and Google Book Search—technologies whose developers believed either that copyright law would not apply or that, if it did, their technological use would be free from liability. These technologists were willing to innovate first and worry about the legal conse-

51. *Id.* at 950–58.

52. *See infra* notes 124–29 and accompanying text.

53. *See* CLAYTON M. CHRISTENSEN, *THE INNOVATOR'S DILEMMA: WHEN NEW TECHNOLOGIES CAUSE GREAT FIRMS TO FAIL* 135 (1997) (“[N]either manufacturers nor customers know how or why the products will be used, and hence do not know what specific features of the product will and will not ultimately be valued.”).

54. *See* IRA FLATOW, *THEY ALL LAUGHED . . . FROM LIGHT BULBS TO LASERS: THE FASCINATING STORIES BEHIND THE GREAT INVENTIONS THAT HAVE CHANGED OUR LIVES* 83 (1992); JAMES GARDNER, *SIDESTEP AND TWIST* 135–37 (2012); DON NORMAN & TAMARA DUNAEFF, *THINGS THAT MAKE US SMART: DEFENDING HUMAN ATTRIBUTES IN THE AGE OF THE MACHINE* 191 (1994). Similarly, Elisha Gray, who claimed he invented the telephone a few weeks before Bell and lost the race to the patent office, envisioned the telephone as “nothing more than a toy.” FLATOW, *supra*, at 72; *see also id.* at 76 (“Believing speech transmission to be a waste of time, the top technical journal of the industry, *The Telegrapher*, put down the idea, claiming it was not new and the telephone had ‘no direct practical application.’”).

55. *See* Nathan Rosenberg, *Factors Affecting the Diffusion of Technology*, 10 *EXPLORATIONS ECON. HIST.* 3, 14 (1972).

56. That is, at least until someone else either is willing to assume the risk or sees the telephone's non-copyright-related potential.

quences later.⁵⁷ However, in recent years, many, if not most, of these technologies have been developed and defended in court by technology industry leaders that can afford the fight.⁵⁸

The current copyright regime, with its broad defaults, appears to have two predominant effects on the development of copyright-using technologies: it either encourages risk-taking by those who can afford the liability, or discourages technological development by those who cannot. Napster and other peering platforms—start-up risk-seekers—fit neither paradigm, but in the wake of Napster’s demise, start-ups and their funders reportedly became unwilling to move against the grain of copyright liability.⁵⁹ And with good reason, as courts evaluating claims that a new technology infringes copyright might overvalue the costs while undervaluing potential future uses, even identifiable uses.⁶⁰

57. This is similar to the practice, at least common in Silicon Valley during the past decade, of creating something new and waiting until it becomes wildly popular to figure out how to monetize it. *See, e.g.*, Matthew Braga, *Twitter’s Road to IPO: Grow First, Monetize Later*, FIN. POST (Sept. 13, 2013, 4:50 PM), http://business.financialpost.com/fp-tech-desk/twitters-road-to-ipo-grow-first-monetize-later?_lsa=75a4-7f74 (“It’s a common story amongst Internet companies of recent vintage, a grow-first-monetize-later strategy that has spawned some particularly successful product and services—at least, in terms of engagement and size.”); David Gelles, *For Facebook, It’s Users First and Profits Later*, N.Y. TIMES DEALBOOK (Feb. 20, 2014, 8:52 PM), <http://dealbook.nytimes.com/2014/02/20/for-facebook-its-users-first-and-profits-later>; Damon Lavrinc, *After 10 Years in the Business, Tesla Finally Turns a Profit*, WIRED (May 8, 2013, 6:17 PM), <http://www.wired.com/2013/05/tesla-profit-q1-2013>.

58. Notably, Google. This poses its own set of normative concerns—namely, whether it is good to refine copyright policy mainly through the judicial process; whether deep-pocket technologists’ interests sufficiently proxy those of the public at large; and whether this process has significant anti-competitive consequences.

59. There are other anomalies, such as digital audio tapes, which were commercialized, but then became largely unavailable at market.

60. *See* R. Anthony Reese, *The Problems of Judging Young Technologies: A Comment on Sony, Tort Doctrines, and the Puzzle of Peer-to-Peer*, 55 CASE W. RES. L. REV. 877, 887–91 (2005); *see also* Daniel Gervais, *The Regulation of Inchoate Technologies*, 47 HOUS. L. REV. 665, 678 (2010) (“[T]he regulation of inchoate technologies cannot, and should not, be approached from the perspective of whether the technology itself or technological progress is ‘good’ or ‘bad.’”). *But see* Jane C. Ginsburg, *Fair Use for Free, or Permitted-but-Paid?*, 29 BERKELEY TECH. L.J. 1383, 1385 (2014) (noting that in some cases, particularly when a new use is seen as “socially beneficial, a court may overemphasize its ‘transformativeness,’ and correspondingly underestimate the market consequences, in order to prevent the copyright owner from frustrating the social benefit”); Ginsburg, *supra* note 28, at 1622–26 (“The Supreme Court has been more reluctant to ‘give full protection to the [copyright] monopoly’ when

These arguments are frequently heard from copyright content owners on one side and technologists on the other. Settling the debate is neither within the scope of this Article nor antecedent to its analytic and normative conclusions. Rather, introducing the debate helps sketch the purported stakes behind content-technology conflicts.⁶¹ Congress had such interests in mind when it began the twenty-one-year process of overhauling the 1909 Act—when it thought it solved copyright law’s new-technology problem with the 1976 Act.

B. TECHNOLOGY NEUTRALITY AND THE 1976 COPYRIGHT ACT

The struggle to adapt law to new technologies is not unique to copyright law, and alongside the increasing pace of innovation, numerous legal regimes have adopted a general drafting principle: technology neutrality.⁶² Foreign countries⁶³ and in-

it has perceived that groups of copyright owners in particular sectors were seeking to prohibit a new form of reproduction and distribution, or to leverage their exclusive reproduction rights into monopoly power over the devices employed to effect the new kinds of reproductions.”).

61. For further reading, see Ginsburg, *supra* note 28; Lemley, *supra* note 47.

62. See, e.g., Nicholas W. Allard & Theresa Lauerhass, *Debalkanize the Telecommunications Marketplace*, 28 CAL. W. L. REV. 231, 231 (1992) (examining the need for a technology-neutral implementation of telecommunications policies); Michael A. Geist, *Is There a There There? Toward Greater Certainty for Internet Jurisdiction*, 16 BERKELEY TECH. L.J. 1345, 1345–46 (2001) (discussing the inadequacies of prior frameworks and the need for a new test to remain technology-neutral); Orin S. Kerr, *Applying the Fourth Amendment to the Internet: A General Approach*, 62 STAN. L. REV. 1005, 1015–17 (2010); Bert-Jaap Koops, *Should ICT Regulation Be Technology-Neutral?*, in STARTING POINTS FOR ICT REGULATION: DECONSTRUCTING PREVALENT POLICY ONE-LINERS 77 (Bert-Jaap Koops et al. eds., 2006) (arguing that ICT regulation should be technology-neutral); Stephanie K. Pell & Christopher Soghoian, *Can You See Me Now? Toward Reasonable Standards for Law Enforcement Access to Location Data that Congress Could Enact*, 27 BERKELEY TECH. L. J. 117 (2012) (proposing a legislative model for law enforcement access standards and downstream privacy protections for location information); Eric Posner & John Yoo, *The Patriot Act Under Fire*, WALL ST. J., Dec. 9, 2003, at A26; see also Paul Ohm, *The Argument Against Technology-Neutral Surveillance Laws*, 88 TEX. L. REV. 1685, 1687–1700 (2010) (analyzing arguments for and against tech neutrality); Chris Reed, *Taking Sides on Technology Neutrality*, 4 SCRIPT-ED 263, 264–65 (2007) (critiquing the narrow approach taken by many to technology neutrality).

63. See, e.g., *Nat’l Rugby League Invests Pty Ltd v Singtel Optus Pty Ltd* [2012] FCAFC 59, ¶ 95 (Austl.) (“The desirability of technological neutrality—of not limiting rights and defences to technologies known at the time when those rights and defences were enacted—has been acknowledged for some time.”); THE COPYRIGHT PENTALOGY: HOW THE SUPREME COURT OF CANADA

ternational agreements also have adopted the principle.⁶⁴ Technology neutrality's lodestar is intent to regulate behavior, not technology; to worry about what occurs, not how it occurs. Whereas technology-specific provisions refer to technological classes (e.g., the fountain pen), technology-neutral laws use "general, vague, open-textured terms that specify purposes, effects, functions, and other general characteristics"⁶⁵ (e.g., any device or process that produces a perceptible writing). The former regulates fountain pens, whereas the latter could reach other pens, typewriters, smartphones, fax machines, and skywriters. The goal of technology neutrality is to disprove Justice Holmes' law of the law: "[i]t cannot be helped, it is as it should be, that the law is behind the times."⁶⁶

Though under-theorized, generally the principle of technology neutrality contains two overarching goals.⁶⁷ First, technology neutrality seeks to promote a statute's longevity—that is, to future-proof the law.⁶⁸ The more technology specific a law is, the more difficult adapting to unforeseen technologies would seem to be; eventually, a technology will emerge that cannot

SHOOK THE FOUNDATIONS OF CANADIAN COPYRIGHT LAW 271–333 (Michael Geist ed., 2013) (discussing technology neutrality in Canada).

64. See, e.g., World Intellectual Property Organization Copyright Treaty art. 8, Dec. 20, 1996, S. Treaty Doc. 105-17 (1997) [hereinafter WIPO Copyright Treaty]; accord MIHÁLY FICSOR, THE LAW OF COPYRIGHT AND THE INTERNET: THE 1996 WIPO TREATIES, THEIR INTERPRETATION AND IMPLEMENTATION C8.06, 496–97 (2002); SILKE VON LEWINSKI, INTERNATIONAL COPYRIGHT LAW AND POLICY 17:75, 457 (2008); Professor Jane C. Ginsburg, Comment Letter on the Right of Making Available 2 (Apr. 7, 2014), http://copyright.gov/docs/making_available/comments/docket2014_2/Jane_Ginsburg.pdf ("Article 8 is designedly 'technology neutral' in order to avoid obsolescence.").

65. Ohm, *supra* note 62, at 1687.

66. OLIVER WENDELL HOLMES, COLLECTED LEGAL PAPERS 294 (1920); see also Joel R. Reidenberg, *Lex Informatica: The Formulation of Information Policy Rules Through Technology*, 76 TEX. L. REV. 553, 566 (1998) ("[T]hat technological developments outpace the rate of legal change poses another particular problem for intellectual property rights; the law always lags behind the technology.").

67. See Lyria Bennett Moses, *Recurring Dilemmas: The Law's Race To Keep up with Technological Change*, 2007 U. ILL. J.L. TECH. & POL'Y 239, 270–76 (noting future-proofing and equivalence); accord Ohm, *supra* note 62, at 1691 ("Those who argue for tech neutrality too rarely explain in detail the reasoning behind their arguments. Quite often, tech neutrality is a principle or rule, and it almost seems to go without saying. Even when proponents of neutrality explain their reasoning, they often do so cursorily. As a result, we lack satisfying theoretical explanations for tech neutrality.").

68. See Koops, *supra* note 62; see also Ohm, *supra* note 62, at 1692–93; Reed, *supra* note 62, at 275–76.

reasonably be covered by the language of the technology-specific statute.⁶⁹ Technology neutrality attempts to invert the consequences of specificity; it presumes that laws untethered to specific technologies will be less disrupted by technological turbulence. Rather than force the law to struggle with new technologies, and in the interest of sparing legislators the time-consuming effort of frequent revisions, technology neutrality attempts to avoid ossification by making a statute more adaptable to technological advances.⁷⁰ It does so through broad, open-textured terms.

Second, technology neutrality aims for greater doctrinal equivalence.⁷¹ By forcing the law to treat like things alike—to avoid limiting a right only to its exercise in extant technology or discriminating against older technology simply because it existed when the law was enacted—technology neutrality seeks to promote greater fairness in the law’s application. Whether a technology-neutral law applies to a given technology (new or old) is intended to turn on relevant features, factors, or characteristics rather than express categorical inclusion.

Additionally, technology neutrality often is adopted as an institutional arrangement, pushing questions arising from new technologies away from legislatures, to courts and administrative agencies. Technology neutrality recognizes that legislatures often take too long and may lack the expertise to frequently update a law in light of new technologies.⁷² Accordingly,

69. See, e.g., *Moses*, *supra* note 67, at 266–68 (discussing section 1962(5) of the California Code of Civil Procedure, enacted in 1872, which presumed paternity if a husband lived with his wife and was not impotent; the Radio Act of 1927, which regulated radio transmission on the belief that the only way to avoid interference was for separate signals to be transmitted across distinct frequencies (this technological constraint soon disappeared, but the licensing regime remained); and fencing-out statutes that limited recovery for rampaging cattle to farmers who erected a fence calculated to keep cattle out (with the invention of barbed wire, such fences became feasible and the law’s purpose, to reduce liability for ranging farmers except where another landowner had erected a fence, was perverted)).

70. See, e.g., *Ohm*, *supra* note 62, at 1688 (“Congress must often choose between tech neutrality and specificity when it drafts surveillance laws because the great challenge of surveillance is keeping up with the latest advances in technology.”).

71. See *id.* at 1691–92; *Reed*, *supra* note 62, at 276.

72. See *Ohm*, *supra* note 62, at 1694 n.55 (“Often arguments like these carry a hint of superiority and maybe even a sense of ridicule. Perhaps other societal institutions can keep up with technology, but not Congress, which is stodgy and out of touch, full of elderly members who are the same.” (citing Jim Puzanghera, *Weighing High-Tech Bills in Analog: Political Issues Pile up in*

the legislature might wish to delegate the responsibility of determining whether a law applies to a new technology to another, presumably better-suited, institution (e.g., the judiciary or an administrative agency). Or it might draft a technology-neutral law so broadly that the law applies, *per se*, to future technologies. Deciding between the two involves allocating, or retaining, the power to regulate in a given area. The former option is based on a presumption that other institutions either should shape policy or are capable of evaluating new technology by analogy; the latter evinces a fear of formalism.⁷³ Generally, delegating to courts or an agency increases administrative costs, legal delay, and uncertainty, but also enables better tailoring.⁷⁴ *Per se* inclusion, on the other hand, is easier to administer and would be expected to increase legal certainty,⁷⁵ but leads to overinclusive application of the law.⁷⁶

Among numerous radical changes that Congress adopted in the 1976 Copyright Act⁷⁷ was the principle of technology neutrality.⁷⁸ Future-proofing and promoting equivalence color the

the Fast-Evolving Sector, but Congress' Expertise Isn't up to Date, L.A. TIMES, Aug. 7, 2006, at C1)).

73. The choice has significant consequences, discussed *infra* Part III.A.

74. See *infra* Part III.B.

75. Though not necessarily. See *infra* Part II.B.

76. If this sounds analogous to the classic rules-standards debate, it is. See *infra* notes 163–64 and accompanying text.

77. See Barbara Ringer, *First Thoughts on the Copyright Act of 1976*, 22 N.Y.L. SCH. L. REV. 477, 479 (1977). Significant departures in the 1976 Act included dropping formalities as a condition to copyright protection, see Brad A. Greenberg, *More than Just a Formality: Instant Authorship and Copyright's Opt-out Future in the Digital Age*, 59 UCLA L. REV. 1028, 1038–39 (2012); scrapping the publication requirement, see Jake Linford, *A Second Look at the Right of First Publication*, 58 J. COPYRIGHT SOC'Y U.S.A. 585, 605 n.109 (2011); transitioning to a single fixed term, see 17 U.S.C. § 302 (2012); giving authors an unwaivable termination right, see Brad A. Greenberg, *DOMA's Ghost and Copyright Reversionary Interests*, 108 NW. U. L. REV. 391, 393–94 (2013); disaggregating each copyright into an infinitely divisible bundle of rights, see § 201(d)(2); H.R. REP. NO. 94-1476, at 5 (1976); codifying the fair use exception to infringement, see § 107; and preempting state copyright laws, see § 301.

78. Technology neutrality also has been referred to by courts as “media neutrality.” See, e.g., *N.Y. Times Co. v. Tasini*, 533 U.S. 483, 502 (2001) (“Invoking the concept of ‘media neutrality,’ the Publishers urge that the ‘transfer of a work between media’ does not ‘alte[r] the character of that work for copyright purposes. That is indeed true.”); *Peter Mayer Publishers Inc. v. Shilovskaya*, 11 F. Supp. 3d 421, 427 (S.D.N.Y. 2014) (“Section 101 reflects copyright law’s general requirement of ‘media-neutrality.’ The concept of ‘media-neutrality’—that a change in medium does not affect a copyrighted work’s status—is well-settled.”).

1976 Copyright Act,⁷⁹ which set technology-neutral defaults in three fundamental areas: subject matter, exclusive rights, and, to a lesser degree, statutory definitions. Best known is the language of Section 102(a): “Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.”⁸⁰ The technology-neutral aspect of Section 102(a) has three features: copyright law covers a copyrighted work fixed in (1) any technology (2) so long as something or someone can perceive it and (3) regardless of whether Congress mentioned the technology specifically.

The technology-neutral nature of exclusive rights is less explicit, but no less express in the structure of Section 106 and the legislative history. Section 106 defines exclusive rights in broad terms⁸¹ and incorporates technology-neutral definitions in Section 101 to avoid “confining the scope of an author’s rights on the basis of the present technology.”⁸² Notably, the

79. Treatise writer David Nimmer calls technology neutrality a “unifying theme” of the 1976 Act. MELVILLE B. NIMMER & DAVID NIMMER, *NIMMER ON COPYRIGHT* § 12A.16(B) (1963); see also *Greenberg v. Nat’l Geo. Soc’y*, 533 F.3d 1244, 1257 (11th Cir. 2008) (“[T]he principle of media neutrality is a staple of the Copyright Act[.]”). And, indeed, the Copyright Office had urged Congress as early as at least 1903 to improve copyright law’s ability to adjust to new technologies. See Thorvald Solberg, *Copyright Law Reform*, 35 *YALE L.J.* 48, 61–62 (1925) (reprinting the conclusion of the Report on Copyright Legislation (Dec. 1, 1903)); see also Zechariah Chafee, Jr., *Reflections on the Law of Copyright: I*, 45 *COLUM. L. REV.* 503, 522 (1945) (“When scientific invention or ingenuity gives an unauthorized person a new way to cash in on the author’s creative ability, the law must either squeeze the novel device into an ill-fitting box or leave the author helplessly watching another man grow wealthy from what he himself gave to the world.”).

80. 17 U.S.C. § 102(a).

81. H.R. REP. NO. 94-1476.

82. *Copyright Law Revision: Hearings on H.R. 4347, H.R. 5680, H.R. 6381, and H.R. 6835 Before the Subcomm. on Courts, Civil Liberties & the Admin. of Justice of the H. Comm. on the Judiciary*, 89th Cong. 32–33 (1965) [hereinafter 1965 House Hearings] (statement of George Cary, Deputy Register of Copyrights); cf. H.R. REP. NO. 105-551, pt. 2, at 24 (1998) (reiterating that “[i]n general, all of these provisions are technology neutral”); STAFF OF THE H. COMM. ON THE JUDICIARY, 89TH CONG., *COPYRIGHT LAW REVISION, PART 6: SUPPLEMENTARY REPORT OF THE REGISTER OF COPYRIGHTS ON THE GENERAL REVISION OF THE U.S. COPYRIGHT LAW 18* (Comm. Print 1965) [hereinafter SUPPLEMENTARY REPORT] (“[I]t would be a mistake for the statute, in trying to deal with such a new and evolving field as that of computer technology, to include an explicit provision that could later turn out to be too broad or too narrow.”).

tangible form of reproductions—copies and phonorecords—need not be physical or visually perceptible; it is sufficient that a copy or phonorecord is a perceivable instantiation of the copyrighted work.⁸³ Similarly, transmitting a work publicly, in violation of Section 106(4), can occur “by means of any device or process,”⁸⁴ including those “not yet in use or even invented.”⁸⁵

Though the defaults were technology neutral, the 1976 Act was enacted with numerous technology-specific provisions.⁸⁶ For example, Section 111 created a compulsory license for cable retransmission. This favored the struggling cable industry, long hampered by copyright litigation and potential FCC regulation,⁸⁷ by converting broadcasters’ exclusive rights into liability rules; the Section 111 compulsory license is only available to technologies that fit within its narrow definition. The 1976 Act also included vestiges of the 1909 Act, such as the compulsory licenses for jukeboxes⁸⁸ and mechanical reproductions of musical works.⁸⁹ And Section 114 created a complicated system for exclusive rights in sound recordings.⁹⁰

83. H.R. REP. NO. 94-1476, at 53 (explaining that if the work of authorship is a “literary work,” the copies or phonorecords could take any form, “including books, periodicals, computer punch cards, microfilm, tape recordings, and so forth”); *see also id.* (“There is no need, for example, to specify the copyrightability of electronic or concrete music in the statute since the form of a work would no longer be of any importance . . .”).

84. 17 U.S.C. § 101.

85. H.R. REP. NO. 94-1476, at 63.

86. *See* Copyright Act of 1976, Pub. L. No. 94-553, 90 Stat. 2541 (1976) (codified as amended in scattered sections of 17 U.S.C.). Subsequently, Congress has amended copyright law with numerous additional technology-specific provisions.

87. Though the Supreme Court disagreed with the broadcasters, holding that cable equipment simply offers a powerful antenna that is functionally similar to the antennas that individual viewers can erect to capture over-the-air broadcast, *Fortnightly Corp. v. United Artists Television, Inc.*, 392 U.S. 390, 399–400 (1968), the FCC soon proposed giving broadcasters through regulation of the cable industry what the 1909 Act did not. *See* Notice of Proposed Rulemaking and Notice of Inquiry, 15 F.C.C.2d 417, 432 (1968) (never enacted). The potential regulation “slowed, if not froze” the cable industry’s growth. Wu, *supra* note 28, at 319; *see also* Leonard Chazen & Leonard Ross, *Federal Regulation of Cable Television: The Visible Hand*, 83 HARV. L. REV. 1820, 1820 (1970) (suggesting alternative regulatory approaches).

88. 17 U.S.C. § 116.

89. *Id.* § 115. Some scholars argue that this has created a below-market rate for privately negotiated music licenses. Lydia Pallas Loren, *Untangling the Web of Music Copyrights*, 53 CASE W. RES. L. REV. 673, 680–83 (2003); *see generally* Frederick F. Greenman, Jr. & Alvin Deutsch, *The Copyright Royalty Tribunal and the Statutory Mechanical Royalty: History and Prospect*, 1

Because the 1976 Act was a mixture of technology-neutral and technology-specific provisions, it is necessary to disentangle the struggles of the neutral and specific provisions. Accordingly, the problems discussed in Part II are only those that have arisen as a result of copyright's technology-neutral defaults. In Part III, I will explain how technological discrimination, by avoiding the extremes of neutrality and specificity that have defined U.S. copyright law, can avoid the pitfalls of both.

Congress's rationale for making the 1976 Act's default provisions—particularly subject matter and exclusive rights—technology neutral appears plain from the legislative history. Technology neutrality was adopted to “avoid the artificial and largely unjustifiable distinctions . . . under which statutory copyrightability in certain cases has been made to depend upon the form or medium in which the work is fixed.”⁹¹ Congress was worried about the development of new technologies that would use copyrighted works but would be outside copyright's reach (and, thereby, the copyright owner's control).⁹² In other words, Congress wanted to future-proof the law so it would apply to unknown and unforeseen technologies, and would do so in an equivalent manner. By using broad language,⁹³ Congress indicated that copyright law would per se apply to future copyright-using technologies; the 1976 Act conferred broad rights to authors, to which courts would subsequently be asked to carve-out narrow exceptions.⁹⁴

Based on the assumption that technology neutrality would behave in copyright law as proponents believe it behaves generally,⁹⁵ “Congress meant to change the old pattern and enact a

CARDOZO ARTS & ENT. L.J. 1 (1982) (discussing the Copyright Royalty Tribunal and the distribution of royalties and royalty rate setting).

90. 17 U.S.C. § 114; *see also* Loren, *supra* note 89 (arguing for a revision of the 1976 Act).

91. H.R. REP. NO. 94-1476, at 52 (1976).

92. *See* REGISTER OF COPYRIGHTS, *supra* note 28, at 5.

93. H.R. REP. NO. 94-1476, at 52; *see also* 1965 House Hearings, *supra* note 82 (“We have tried to phrase the broad rights granted in such a way that they can be adapted as time goes on to each of the new advancing media.”); SUPPLEMENTARY REPORT, *supra* note 82, at 13–14 (“A real danger to be guarded against is that of confining the scope of an author's rights on the basis of the present technology so that, as the years go by, his copyright loses much of its value because of unforeseen technical advances. For these reasons, we believe that the author's rights should be stated in the statute in broad terms . . .”).

94. *See* Litman, *supra* note 28, at 281; *supra* note 93.

95. The legislative history shows no evidence of technology neutrality being challenged on its ability to future-proof the statute and promote equiva-

statute that would cover new technologies, as well as old,” in the words of Justice Blackmun.⁹⁶ That all new copyright-using technologies are subject to copyright law gave the 1976 Act the appearance of flexibility in the face of increasingly rapid technological change. Only authors or users unhappy with the law’s application would feel the need to lobby Congress for technology-specific treatment. Neutrality was a blunt tool, but it appeared to guard copyright law against obsolescence, even if over time it became apparent that the law was often too general to be adequately tailored to new technologies.⁹⁷ Indeed, four decades later, technology neutrality continues to be touted as value-maximizing in copyright law.⁹⁸

lence. The criticisms then, to the extent there were any, related to the broad nature of rights conferred to authors by technology-neutral defaults and the limited number of statutory exceptions and exemptions for specific uses and users. *See supra* note 93.

96. *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 457–58 (1984) (Blackmun, J., dissenting).

97. Which Congress acknowledged explicitly in the DMCA’s legislative history and implicitly with its passage. H.R. REP. NO. 105-551(II), at 21 (1998) (noting that the DMCA was enacted as “part of the [international] effort to begin updating national laws for the digital era”).

98. *See, e.g.*, Brief for International Federation of the Phonographic Industry (IFPI), et al. as Amici Curiae Supporting Petitioners at 2, *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498 (2014) (No. 13-461), 2014 WL 891768, at *2; Maria Martin-Prat, *The Future of Copyright in Europe*, 38 COLUM. J.L. & ARTS 29, 44 (2014) (presenting an extended version of the Twenty-Seventh Horace S. Manges Lecture delivered on April 7, 2014, at Columbia Law School, in which the head of the European Commission’s Copyright Unit stated that “the more technology accelerates, the less copyright should rely on technology-bound concepts”); Guido Westkamp, *Code, Copying, Competition: The Subversive Force of Para-Copyright and the Need for an Unfair Competition Based Reassessment of DRM Laws After Infopaq*, 58 J. COPYRIGHT SOC’Y U.S.A. 665, 705 (2011) (arguing that technology neutrality is important to copyright law because it helps adjudicators keep in perspective a “multitude of interests that must be brought in line”); Jay W. Ferguson, Comment, *XM Lawsuit: Threats to the Incentive Model of Copyright Genesis and the Obsolescence of the AHRA in a Digital Age of Hybrid Technology*, 28 N. ILL. U. L. REV. 125, 162–63 (2007) (arguing for a technology-neutral amendment to address “hybrid technology” that facilitate transmission, which in the music context is governed by compulsory license, and enable reproduction for later enjoyment, which is not authorized by compulsory license); Andrew Stockment, Note, *Internet Radio: The Case for a Technology Neutral Royalty Standard*, 95 VA. L. REV. 2129, 2131 (2009) (arguing for “a single, technology neutral standard for determining the royalties for digital radio”). Similarly, the Visual Artists Rights Act (VARA) has been criticized as too narrowly focused on art forms that were better known at the time of the copyright amendment. *See* Martina Hinojosa, Note, *Challenges for Emerging Art Forms Under the Visual Artists Rights Act*, 11 J. ON TELECOMM. & HIGH TECH. L. 433, 434 (2013).

But technology neutrality has not delivered the anticipated benefits. Judges have struggled with applying “the nebulous concept”⁹⁹ and have treated similar technologies unevenly and inconsistently, often based on small technological differences that are functionally irrelevant.¹⁰⁰ Additionally, not long after the 1976 Copyright Act took effect on January 1, 1978, copyright content owners complained that the statute was outmoded or being incorrectly applied, and lobbied for revisions.¹⁰¹ At the urging of frustrated copyright owners and even the Register of Copyrights,¹⁰² the statute has been amended thirty-one times to add or revise technology-specific provisions. Revisions have added complexity to the 1976 Act, and on occasion without clear benefit to copyright owners or users.

For example, in response to strong record industry lobbying regarding digital audio recordings—largely motivated by fear of a new technology that could “make perfect multi-generational digital audio recordings”¹⁰³ and the outcome of the legal challenge to the home videocassette recorder—Congress passed the Audio Home Recording Act of 1992 (AHRA).¹⁰⁴ The AHRA amended copyright law to impose a levy on manufacturers of digital audio recording devices.¹⁰⁵ But, levy aside, the technology was commercially unsuccessful, and Chapter 10 of

99. *Greenberg v. Nat’l Geographic Soc’y*, 533 F.3d 1244, 1272 (11th Cir. 2008) (Birch, J., dissenting).

100. *See infra* Part II.C.

101. Jessica Litman notes that, in 1989, nineteen copyright bills were pending in Congress. Litman, *supra* note 28, at 275.

102. *See* Thomas P. Olson, *The Iron Law of Consensus: Congressional Responses to Proposed Copyright Reforms Since the 1909 Act*, 36 J. COPYRIGHT SOC’Y U.S.A. 109, 109–10 (1989) (providing several examples of authors and copyright owners urging reform of the 1976 Act); Ralph Oman, *1976 Copyright Revision Revisited*: “Lector, si Monumentum Requiris, Circumspice,” 34 J. COPYRIGHT SOC’Y U.S.A. 29, 30 (1986) (arguing that, by reference to the litigation over the VCR and the debate over satellite communications, “regardless of Congress’ attempt to include these unknown technologies in the embrace of the new copyright law, the courts so far have politely declined their invitation”).

103. Christopher Doval et al., *The Next Great Copyright Act and the Future of Radio*, 14 J. MARSHALL REV. INTELL. PROP. L. 378, 386 (2015); *see also* Recording Indus. Ass’n of Am. v. Diamond Multimedia Sys., Inc., 180 F.3d 1072, 1073 (9th Cir. 1999) (“With digital recording, by contrast [to analog], there is almost no degradation in sound quality, no matter how many generations of copies are made. Digital copying thus allows thousands of perfect or near perfect copies (and copies of copies) to be made from a single original recording.”).

104. Audio Home Recording Act of 1992, Pub. L. No. 102-563, 106 Stat. 4237 (codified as amended at 17 U.S.C. §§ 1001–1010).

105. *Id.*

U.S. Code Title 17 stands largely as an anachronism from a technological future that never was.¹⁰⁶ For reasons discussed below, the failures of the AHRA are not inherent to greater technology specificity.

Whereas the technology-specific provisions included with the 1976 Act signaled Congress's belief that extant technology should be treated differently, those that have been added since suggest that the technology-neutral defaults did not serve their purpose for many new technologies. For example, the personal videocassette recorder and communication satellites both were emerging at the end of the revision process—in fact, the legal challenge to Sony's Betamax began only three weeks after the 1976 Act was signed¹⁰⁷—but neither received special treatment. In turn, under the technology-neutral defaults, courts quickly “struggled” to apply copyright law to videocassette recorders and communications satellites,¹⁰⁸ pushing the Betamax case to the Supreme Court and two technology-specific revisions relating to satellite transmission of distant television and local television.¹⁰⁹ The satellite provisions are notoriously impenetrable.¹¹⁰

Though copyright law should reach new types of authorial works and new technological mediums,¹¹¹ it “may often produce unexpected and unjust results if spread uniformly over so many

106. See WILLIAM F. PATRY, 1 PATRY ON COPYRIGHT § 21:84, Westlaw (database updated Sept. 2015) (describing AHRA provisions regarding digital audio recording devices).

107. See *Universal City Studios, Inc. v. Sony Corp. of Am.*, No. CV 76-3520-F (C.D. Cal. Nov. 11, 1976). And the Sony Betamax had already been sold in U.S. stores for about a year. See Jessica Litman, *The Story of Sony v. Universal Studios: Mary Poppins Meets the Boston Strangler*, in INTELLECTUAL PROPERTY STORIES 358, 359 (Jane C. Ginsburg & Rochelle C. Dreyfuss eds., 2006); see also LARDNER, *supra* note 44. Moreover, Betamax was not the first home video recording device. LARDNER, *supra* note 44, at 75–84; NICK LYONS, THE SONY VISION 202–15 (1976).

108. Litman, *supra* note 28, at 315–16. It may be that the window for addressing these emerging technologies had already closed by the time Congress became aware of their potential importance.

109. Satellite Home Viewer Act of 1988, Pub. L. No. 100-667, 102 Stat. 3949 (codified as amended at 17 U.S.C. § 119); Satellite Home Viewer Improvement Act of 1999, Pub. L. No. 106-113, Div. B. § 1000(a)(9), 113 Stat. 1501 (codified as amended at 17 U.S.C. § 122).

110. See, e.g., William Patry, *A Precis on Section 119*, PATRY COPYRIGHT BLOG (May 25, 2006, 10:41 AM), <http://williampatry.blogspot.com/2006/05/precis-on-section-119.html> (“Section 119 compulsory license for satellite re-transmissions is not for the faint of heart.”).

111. See Chafee, *supra* note 79, at 504–05.

divergent things and acts.”¹¹² The 1976 Act’s adoption of technology-neutral defaults—in recognition of the former principle and ignorance of the latter—is a poignant example. Recognizing that technology neutrality has not performed as expected helps illuminate deficiencies in the 1976 Act’s technology-neutral language, specifically, and barriers to achieving technology neutrality, generally. Technology neutrality’s goals are intuitive, but, upon close inspection, they too often are neither desirable nor attainable.

II. DECONSTRUCTING TECHNOLOGY NEUTRALITY

To avoid being made obsolete by technological changes, a law needs to anticipate innovations; it can do so through prescience or, more realistically, provisions that enable flexible application. In an attempt to achieve the latter, the 1976 Act chose broad terms that are inclusive of unforeseen technologies. Based on accepted principles at the time the law is passed, a technology-neutral law is drafted to regulate particular behavior—a legal means to regulating an end use, regardless of the technological path along which the use travels. And in many circumstances this makes sense.

For example, one would expect the author of a novella to have the same rights to control its exploitation regardless of whether it was written using a pen or typewriter or word processor.¹¹³ Digitally compressed music offers another example of how the 1976 Act’s technology-neutral defaults may have spared copyright owners the formalistic fate of the sheet music composers. Like the piano rolls and wax records of roughly a century earlier, courts could have looked at MP3 and WAV files, and decided that the form of the music, of which there existed no physical copy, looked nothing like the types of copies or phonorecords identified in a technology-specific copyright law. Applying the logic of *White-Smith Music* would have placed digitally compressed music outside copyright’s reach, and, thereby, enabled iTunes to sell music and webcasters to stream it without any license or royalty liability for exploiting the musical composition. But that is not what happened. An obvious explanation is that, unlike the 1870 Copyright Act that controlled in

112. *Id.* at 518.

113. *Cf.* *N.Y. Times Co. v. Tasini*, 533 U.S. 483, 488 (2001) (holding that the author of a newspaper article licensed as part of a collective work retained control over the use of that article as an individual contribution to a digital database).

White-Smith Music, the 1976 Act is technology neutral and the examples of copies and phonorecords enumerated in Section 101 are just that: examples.¹¹⁴ The list is neither exhaustive nor limited even to technologies known at the time of the law's enactment. Accordingly, a digitally compressed music file, to the extent it contains a form of the copyrighted work that can be perceived by a person or a machine, is subject to copyright.¹¹⁵

A related benefit of technology neutrality, as it pertains to subjecting new works or uses to copyright control, is that neutral defaults keep copyright-using technologies within the copyright system by encouraging use-specific exceptions rather than technology-specific exclusions.¹¹⁶ That, in turn, confers on an author greater default control over her copyrighted work and increases the likelihood of remuneration for new uses while simultaneously protecting existing commercial markets and technological formats. Whether this enhances social welfare is a popular normative debate among copyright scholars,¹¹⁷ albeit beyond this Article's scope. But the legislative history suggests that Congress intended to grant authors control over new uses and markets.¹¹⁸ And, to that end, technology neutrality creates a presumption of copyright reaching new tech.

However, technology neutrality discounts, if not overlooks, countervailing reasons to avoid future-proofing, as well as the downsides to treating differences alike. Significantly, technology neutrality assumes the propriety of old laws regulating new technologies. Yet fading normativity and elusive neutrality, as detailed in this Part, make technology neutrality both subopti-

114. H.R. REP. NO. 94-1476, at 53–54 (1976).

115. Yet, for reasons discussed *infra* in Part III.B, it is more likely that even under the technology-specific 1909 Act digitally compressed music would have been within copyright law.

116. This is the 1976 Act's default approach, though some technologies receive specific treatment.

117. See, e.g., Balganesch, *supra* note 46, at 1589–91 (arguing that content owners “clearly are not best positioned to develop” new markets, which can “facilitate a potential holdout, raising the transaction costs for developers of new media and devices and stifling innovation in the process”); Ginsburg, *supra* note 28, at 1619 (arguing that copyright control over new markets “not only enhances the moral appeal of the exercise of copyright, but also may offer the public an increased quantity and variety of works of authorship”); Raymond Shih Ray Ku, *The Creative Destruction of Copyright: Napster and the New Economics of Digital Technology*, 69 U. CHI. L. REV. 263, 312–15 (2002) (proposing a statutory levy on “subscriptions for Internet service and the sales of computer, audio, and video equipment” to permit private copying without creating a new exception to copyright for peer-to-peer technology).

118. See *supra* notes 91–94 and accompanying text.

mal and self-defeating. Future-proofing a statute so that it need not be amended in response to unforeseen technologies only embodies normative preferences to the extent norms remain constant—and technological development has the potential to shift paradigms and, in the process, displace the first principles that undergird the technology-neutral law. Relatedly, mandating ex ante application of the law to new technologies assumes that subjecting extant and future technologies to copyright liability imposes the same costs and benefits to the copyright system and to society. This overlooks the possibility that different technologies warrant different treatment, mistaking equal application for equivalence. Moreover, even when technology neutrality is desirable, the goals are undermined by inconsistent application and a statutory mindset favoring old technologies. These shortcomings are derivative of four conceptual “problems,” articulated below, with treating technology neutrality as a legislative principle.

The consequences are numerous. Technology-neutral defaults have led to often exceptionally narrow (and quickly obsolete) conflict-specific resolutions. Rather than broadly addressing the social costs, benefits, and possibilities of a new technology, Congress has drawn technology-specific amendments responsive to narrow conflicts between interested parties.¹¹⁹ Conflict-specific resolutions contribute to what Joseph Liu calls “regulatory copyright”—the hallmark of which is Congress’s increased “willing[ness] to intervene in the structure of copyright markets” with narrow amendments.¹²⁰ Regulatory copyright, in turn, increases the complexity—and density—of copyright law.¹²¹ Additionally, new use-specific exceptions, cou-

119. See, e.g., *supra* notes 99–106 and accompanying text (discussing the AHRA).

120. Joseph P. Liu, *Regulatory Copyright*, 83 N.C. L. REV. 87, 91 (2004); see also Mark A. Lemley, *The Regulatory Turn in IP*, 36 HARV. J.L. & PUB. POLY 109, 110–11 (2013) (“In both copyright and patent . . . we have seen a turn increasingly towards the regulatory side of IP . . .”).

121. See, e.g., Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1637–38 (stating that copyright law’s “industry-specific rules and exceptions have led to a bloated, impenetrable statute that reads like the tax code”); Liu, *supra* note 120, at 89 (“Many commentators have become concerned that the complexity of the code is making it more difficult for individuals to understand and comply with its provisions. Others have lamented the complexity of certain, very detailed, provisions.” (footnote omitted)). *But see* Daniel Martin Katz & Michael J. Bommarito II, *Measuring the Complexity of the Law: The United States Code 38–40* (unpublished manuscript) (draft of Aug. 1, 2013), http://papers.ssrn.com/sol3/papers.cfm?abstract_

pled with inconsistent judicial application of technology-neutral rights, have increased legal uncertainty.¹²² And, finally, the ways in which courts have applied the 1976 Act's technology-neutral provisions have often encouraged exploitation of ambiguity or silence in positive law.¹²³

A. PROBLEM OF PREDICTION

A key shortcoming of technology neutrality stems from the fact that technological developments are notoriously unpredictable,¹²⁴ and history is littered with the commercially dead remains of Next Big Things. Remember Laserdiscs? There also are the bold claims about a technology's lack of utility that only a few years later look comically myopic.¹²⁵ Well-known examples include Harry Warner of Warner Bros. asking in 1927, "Who the hell wants to hear actors talk?"¹²⁶ and the founder of the minicomputer manufacturer Digital Equipment Corp. saying in 1977 that "there is no reason for any individual to have a computer in their home."¹²⁷ Notably, the father of disruptive-

id=2307352 (finding that of forty-nine titles of the U.S. Code, copyright law's Title 17 ranks thirtieth most complex).

122. The volition doctrine, which limits copyright liability to an individual's "volitional conduct that violates the Act," *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498, 2512 (2014) (Scalia, J., dissenting), is illustrative. The doctrine has been central to many cases involving new technologies that implicate the reproduction right or the public performance right, but its application has been inconsistent. And the *Aereo* majority's silence on the doctrine further clouded its reach. Likewise, the scope of the distribution right and the transmission right with respect to new technologies have been heavily disputed, as discussed more *infra* Part II.B–C.

123. See *infra* note 225 and accompanying text.

124. See, e.g., CHRISTENSEN, *supra* note 53; Grant Gilmore, *On Statutory Obsolescence*, 39 U. COLO. L. REV. 461, 467 (1967); Eugene Volokh, *Technology and the Future of Law*, 47 STAN. L. REV. 1375, 1375–76 (1995).

125. See L. Gordon Crovitz, *Technology Predictions Are Mostly Bunk*, WALL ST. J., Dec. 28, 2009, at A15 (recounting the ten worst technology predictions of all time).

126. SCOTT KIRSNER, *INVENTING THE MOVIES: HOLLYWOOD'S EPIC BATTLE BETWEEN INNOVATION AND THE STATUS QUO, FROM THOMAS EDISON TO STEVE JOBS* 18 (2008).

127. Ken Olsen claims he was referring to computers controlling all operations in a home, not to personal computers. See EDGAR H. SCHEIN, *DEC IS DEAD, LONG LIVE DEC: THE LASTING LEGACY OF DIGITAL EQUIPMENT CORPORATION* 53–55 (2010). But the Internet of Things has disproven even that more conservative prediction. See, e.g., Robert L. Mitchell, *The Internet of Things at Home*, COMPUTERWORLD (June 30, 2014, 6:30 AM), <http://www.computerworld.com/article/2474727/consumerization/150407-the-internet-of-things.html>

("The Internet of Things is changing simple homes into smart homes, where everything from your lights to your locks can be controlled from your

innovation theory predicted in 2007 “that Apple won’t succeed with the iPhone. . . . History speaks pretty loudly on that.”¹²⁸ In hindsight, these miscalculations look abjectly shortsighted—but that is an indication of how difficult it can be to predict the future value of true innovation.¹²⁹

The unpredictable nature of innovation compounds the challenges of foreseeing the technological future, particularly for Members of Congress, who typically lack the expertise of those in the field.¹³⁰ Some innovations are subtle and frequent, like improvements to the typewriter; others are dramatic and paradigm shifting, like the computer processor.¹³¹ Rapid and sporadic innovations are much more difficult to predict because they defy the general human vision of the future as a linearly enhanced version of the present. These innovations cause ex-

smartphone.”). There are also numerous apocryphal stories, like the U.S. patent commissioner who purportedly resigned in 1899 because “[e]verything that can be invented has been invented.” See Samuel Sass, *A Patently False Patent Myth*, 13 SKEPTICAL INQUIRER 310, 311 (1989) (attributing the quote’s origin to a 1981 book); Dennis Crouch, *Tracing the Quote: Everything that Can Be Invented Has Been Invented*, PATENTLY-O (Jan. 6, 2011), <http://patentlyo.com/patent/2011/01/tracing-the-quote-everything-that-can-be-invented-has-been-invented.html> (suggesting that the quote actually originated from an 1899 edition of *Punch* magazine).

128. Jena McGregor, *Clayton Christensen’s Innovation Brain*, BUSINESSWEEK (June 15, 2007), <http://www.bloomberg.com/bw/stories/2007-06-15/clayton-christensens-innovation-brainbusinessweek-business-news-stock-market-and-financial-advice>.

129. See CHRISTENSEN, *supra* note 53, at 150–51 (“[N]either manufacturers nor customers know how or why the products will be used, and hence do not know what specific features of the product will and will not ultimately be valued.”). This challenge of predicting innovation is, of course, not limited to technology. Just ask the record company that told the Beatles they had “no future in show business” or the professional basketball players who thought the slam dunk was an unacceptable way to score. See Eddie Deezen, *The Record Company That Rejected the Beatles*, NEATORAMA (Jan. 1, 2013, 6:00 AM), <http://www.neatorama.com/2013/01/01/The-Record-Company-That-Rejected-The-Beatles>; Evin Demirel, *Secret History of the First Dunk*, DAILY BEAST (Feb. 15, 2014, 4:45 AM), <http://www.thedailybeast.com/articles/2014/02/15/the-first-dunk-in-basketball.html>.

130. Cf. Peter S. Menell, *In Search of Copyright’s Lost Ark: Interpreting the Right To Distribute in the Internet Age*, 59 J. COPYRIGHT SOC’Y U.S.A. 1, 56 n.234 (2011) (“Peer-to-peer technology was not even anticipated at the time Congress passed the DMCA in 1998.”).

131. See Michael L. Tushman & Philip Anderson, *Technological Discontinuities and Organizational Environments*, 31 ADMIN. SCI. Q. 439, 439 (1986) (using as case studies the minicomputer, cement, and airline industries to “demonstrate that technology evolves through periods of incremental change punctuated by technological breakthroughs that either enhance or destroy the competence of firms in an industry”).

ponential changes to their environment. And it is the rapid and sporadic innovations that primarily open new markets for copyrighted works. Therein lies a core shortcoming of technology neutrality's underlying principles.

This shortcoming—what I call the problem of prediction—is twofold. The first is implicit in the arguments favoring neutrality: we cannot know what future technology will look like, and thus the law should be drafted to adapt to the unforeseen.¹³² The other problem, related but overlooked, pushes against technology neutrality: we cannot predict whether applying a law to a new technology will promote—or undermine—the law's policy goals. In other words, Congress could not have known in 1976 whether copyright law should apply in exactly the same manner to Internet search engines when it had no vision of the World Wide Web; nor, for related reasons, could Congress have known how it wanted copyright law to treat webcasting or peer-to-peer file sharing or Internet-based audio-visual transmissions.

In the abstract, legislators can say that they want an unknown B to be treated like a known A. But until B's nature and capabilities are understood—until legislators have some appreciation for how the law will affect B, and the attendant welfare costs and benefits—it is impossible to evaluate the extent to which the law actually should treat B like A.¹³³ Technology neutrality is based on the premise that technology-neutral laws can adequately anticipate known unknowns. The trouble is: technological spikes inject unknown unknowns.¹³⁴

132. This concept peppers the legislative history of the 1976 Copyright Act. See, e.g., SUPPLEMENTARY REPORT, *supra* note 82, at 13 (“[O]f the many problems dealt with in the bill, those covered by the exclusive rights sections are most affected by advancing technology in all fields of communications, including a number of future developments that can only be speculated about.”).

133. In many cases, the default of copyright law applying to a new technology as it applied to old technologies has not imposed costs that undermine copyright policy goals—namely, the advancement of knowledge and learning. In other cases, as discussed in Part II.B, courts have utilized the fair use doctrine to provide new technologies relief from liability. But this is not always true.

134. Here I adopt former Secretary of Defense Donald Rumsfeld's taxonomy of things: “there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns” *DoD News Briefing—Secretary Rumsfeld and Gen. Myers*, U.S. DEP'T OF DEF. (Feb. 12, 2002, 11:30 AM), <http://archive.defense.gov/transcripts/transcript.aspx?transcriptid=2636>; see also Derek E. Bambauer, *Ghost in the Network*,

Moreover, when Congress attempts to draft laws with an eye toward an unknown future, it does so from the vantage point of contemporary technological limitations,¹³⁵ crafting technology-neutral laws with extant technology in mind.¹³⁶ Like the nineteenth-century farmer who imagines a sharper plow but is unable to foresee the combustion engine, Congress imagines linear advances from extant technology.¹³⁷ Thus, laws theoretically tailored to known unknowns—in a world of unknown unknowns—are, in fact, based on known knowns.

Within the rubric of known knowns, Congress might see no harm in courts applying copyright law to a new technology in exactly the manner courts apply copyright law to extant technology.¹³⁸ But the arrival of the Internet—and with it the democratization of authorship, the digitization of everything, and the disappearance of physical copies—complicates the calculus. The Internet, like the combustion engine to the farmer, is a technological discontinuity—a rapid spike on the timeline of innovation that moves the future of technology onto a new plane.¹³⁹ And the principles underlying the law, whether technology specific or neutral, are disrupted.

Copyright's lack of appreciation for the unknown unknowns is visible in the delineation of copyright's exclusive

162 U. PA. L. REV. 1011, 1018 (2014) (using this concept of known unknowns and unknown unknowns in the context of cybersecurity).

135. See GUIDO CALABRESI, *A COMMON LAW FOR THE AGE OF STATUTES* 130–31 (1982).

136. See Michael Birnhack, *Reverse Engineering Informational Privacy Law*, 15 *YALE J.L. & TECH.* 24, 28 (2012) (“Time and again we realize that a law that seemed to be technology-neutral at one point (usually the time of its legislation), is in fact based on a particular technology, albeit in a general manner. We often realize the technological mindset that is embedded in the law only once a new technological paradigm replaces the previous one.”).

137. Cf. RICHARD R. NELSON & SIDNEY G. WINTER, *AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE* 128–31 (1982) (arguing that innovation is a process of trial and error); TIM WU, *THE MASTER SWITCH* 111 (2010) (“General human ignorance about the future leads to a great many human errors.”).

138. This is related to the problem of the penumbra, discussed further *infra* Part II.B.

139. See Edward Lee, *Rules and Standards for Cyberspace*, 77 *NOTRE DAME L. REV.* 1275, 1279 (2002) (“While the law has lagged behind technological developments in the past, the Internet seems to present challenges of an entirely different order.”). See generally Philip Anderson & Michael L. Tushman, *Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change*, 35 *ADMIN. SCI. Q.* 604, 605 (1990) (discussing “when and how dominant designs emerge from technological discontinuities”); Tushman & Anderson, *supra* note 131 (discussing “patterns of technological change”).

rights. Beyond the scope of rights being too broadly applied to some unforeseen technologies, the rationale for separating exclusive rights into six categorical rights has broken down as technology has advanced. In particular, the distribution right found in Section 106(3)¹⁴⁰ and the public performance right in Section 106(4)¹⁴¹ evince an antiquated understanding of communications technologies—one that ignores the way digital technologies bundle the rights. Section 106(3) applies to both distribution of physical copies and digital downloads; Section 106(4) prohibits the transmission or streaming of a copyrighted work in public or to the public. This made sense in 1976 because reproduction and distribution were one business, and public performance was another. That no longer is true. Moreover, as Jane Ginsburg has noted, “that approach assumes that it is possible today, and more importantly, will remain possible tomorrow, to ascertain what is a stream and what is a download.”¹⁴² Indeed, as the Second Circuit stated in *United States v. American Society of Composers, Authors and Publishers*, “under certain circumstances . . . a transmission could constitute both a stream and a download, each of which implicates a different right of the copyright holder.”¹⁴³

The facts in *American Broadcasting Companies, Inc. v. Aereo, Inc.* further called into question the distinctness of the different exclusive rights. The Court only addressed the public performance right, but a counterfactual demonstrates that copyright’s exclusive rights are borne of a technological mindset. That technological mindset, which explains the division of the exclusive rights, hinders copyright law’s ability to reach substantively equivalent technologies and business models. Imagine that rather than stream content to a subscriber, Aereo communicated an inert file to the subscriber’s computer. When the subscriber later opens the file and watches the content, Aereo no longer would be liable for infringing the copyright owner’s public performance right because the communication was not simultaneously viewable or audible, as required by the statute. Copyright control then would shift to the distribution right in Section 106(3), but if Aereo made copies at the direction of users, would a distribution actually have occurred? If not, then the copyright question would turn to the reproduction

140. 17 U.S.C. § 106(3) (2012).

141. *Id.* § 106(4).

142. Ginsburg, *supra* note 64, at 9.

143. 627 F.3d 64, 74 n.10 (2d Cir. 2010).

right. Such piecemeal regulation, beyond being unprincipled, invites technological manipulation designed to skirt liability while engaging in practices that do not conform to the spirit of the law.¹⁴⁴

In light of these predictive limitations, Congress cannot be expected to really know whether the law should apply to a yet unknown technology. And by choosing technology neutrality, it creates a false sense that the law can avoid general overhaul.

B. PROBLEM OF THE PENUMBRA

Moreover, by dictating per se inclusion of new technologies within an existing statute's ambit, technology neutrality amplifies the general jurisprudential challenge of determining what the law governs and whether it should. New technologies add new wrinkles to the law's application. Interacting with the problem of prediction, the law's ability to speak clearly to proscribed behavior becomes more muddled over time.

This is technology neutrality's problem of the penumbra. The shortcoming can be better understood by considering H.L.A. Hart's canonical illustration of interpretative challenges: "A legal rule forbids you to take a vehicle into the public park. Plainly this forbids an automobile, but what about bicycles, roller skates, toy automobiles? What about airplanes? Are these, as we say, to be called 'vehicles' for the purpose of the rule or not?"¹⁴⁵

The hypothetical is short, as is the rule: no vehicles in the park. But the application is anything but simple or straightforward. In a debate with Lon Fuller¹⁴⁶ that has spawned an immense literature,¹⁴⁷ Hart said the easy cases are those involving the rule's "core" (i.e., automobiles); more difficult are those possibly belonging in the partially obscured "penumbra" (e.g., bicycles, roller skates, toy automobiles, airplanes).¹⁴⁸

Hart's hypothetical invites innumerable variations. What about an ambulance, for example? Clearly, an ambulance is a vehicle, but in an emergency should it not be permitted to enter

144. See *infra* notes 224–25 and accompanying text.

145. H.L.A. Hart, *Positivism and the Separation of Law and Morals*, 71 HARV. L. REV. 593, 607 (1958).

146. Lon L. Fuller, *Positivism and Fidelity to Law—A Reply to Professor Hart*, 71 HARV. L. REV. 630, 661–69 (1958).

147. See Frederick Schauer, *A Critical Guide to Vehicles in the Park*, 83 N.Y.U. L. REV. 1109, 1111 n.10 (2008) (summarizing the literature).

148. Hart, *supra* note 145.

the park? Or what to make of the commonly accepted definition of a vehicle—“a machine that is used to carry people or goods from one place to another”¹⁴⁹—not covering all automobiles (e.g., an inert car) yet implicating conveyances that could not reasonably be within the proscription (e.g., a baby stroller)? Other variations likewise raise doubt about whether the law will apply or should apply; each increases the penumbra of uncertainty. And the penumbra generally is unavoidable, even at the moment a law is enacted, because laws cannot reasonably be drafted to explicitly speak to every possibly relevant scenario.

Interpreting statutory language is a challenge with all types of legislation. But it is more problematic with a technology-neutral law because the penumbra expands as the law ages. There are two reasons. First, a law drafted for future technologies typically must speak in broader generalities than a technology-specific law. For example, the vehicles-in-the-park prohibition has in mind certain bounds of the word “vehicle.” This latent definition is based on accepted meaning, and that, in turn, is shaped by technological limitations. As technology advances, that definition changes and new “vehicles” fall into the law’s penumbra of uncertainty. (For example, is a Segway a vehicle? What about a drone? Does it matter if the drone carries only a camera for surveillance or if it is delivering beer?) In contrast, a technology-specific law—e.g., No Skateboards—is less prone to penumbral enlargement.

Similarly, the 1976 Act’s grant of control over transmissions to the public is based on unstated assumptions about the types of technology capable of transmitting copyrighted works to the public. Congress did not envision communication technologies that could transmit the exact same content to large numbers of people via copies and channels unique to each audience member.¹⁵⁰ Thus, it was unclear whether Aereo infringed the broadcasters’ public performance right when it rebroadcast to an individual subscriber a copy made only for that subscriber. Was Aereo transmitting to an audience of one or to an audience of everyone viewing any copy of the same content? Courts

149. *Vehicle*, MERRIAM-WEBSTER, <http://www.merriam-webster.com/dictionary> (last visited Mar. 17, 2016).

150. The former is typically a sufficient but not necessary element of public performance; the latter is a hallmark of private performance.

disagreed¹⁵¹ and three Supreme Court justices, dissenting from the majority opinion holding that Aereo infringed Section 106(4),¹⁵² countered that the statute did not speak to Aereo's technology.¹⁵³ Whereas the 1976 Act was enacted with a penumbra of uncertainty around what qualified as "the public" (is the threshold two people or fifty?) or as a transmission (must it actually be seen by anyone?), new technologies, like Aereo, enlarge the area of uncertainty by creating questions that legislators did not imagine were technologically possible.

The second reason the penumbra is more problematic is that technology neutrality, counterintuitively, causes the law to ossify. Though one of the core purposes of technology neutrality is future-proofing,¹⁵⁴ that goal presumes that technology-neutral laws actually adapt well to change. When they do not, legislators may be left with the false impression that the law need not be updated. That helps explain why updating copyright law has been such a piecemeal process, one of conflict resolution rather than holistic review—pain management rather than restorative treatment.¹⁵⁵

The questions raised by the penumbra cannot be answered as "a matter of logical deduction" and, thus, if rational, must be grounded in something else.¹⁵⁶ Instead, whether the law applies to a case in the penumbral area must be answered by positing

151. *See* Cmty. Television of Utah, L.L.C. v. Aereo, Inc., 997 F. Supp. 2d 1202 (D. Utah 2014) (finding that Aereo infringed plaintiffs' copyrights); *Am. Broad. Cos. v. Aereo, Inc.*, 874 F. Supp. 2d 373, 375 (S.D.N.Y. 2012) (finding that plaintiffs failed to show a likelihood of infringement); *see also* Fox Television Sys., Inc. v. BarryDriller Content Sys., P.L.C., 915 F. Supp. 2d 1138, 1143 (C.D. Cal. 2012) (finding that defendant's technology, which is materially similar to Aereo's, infringed plaintiffs' copyrights); *Fox Television Stations, Inc. v. FilmOn X L.L.C.*, 966 F. Supp. 2d 30, 46 (D.D.C. 2013) (same, though only finding a likelihood of infringement in granting a preliminary injunction).

152. *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498, 2511 (2014).

153. *Id.* at 2517 (Scalia, J., dissenting) ("It is not the role of this Court to identify and plug loop-holes. It is the role of good lawyers to identify and exploit them, and the role of Congress to eliminate them if it wishes. Congress can do that, I may add, in a much more targeted, better informed, and less disruptive fashion than the crude 'looks-like-cable-TV' solution the Court invents today.").

154. *See supra* notes 67–68 and accompanying text.

155. The political landscape also helps explain the lack of a major overhaul. *See* S.A. Miller & Stephen Dinan, *Gridlock in Congress Rekindled Quickly Despite Democrat, Republican Calls for Cooperation*, WASH. TIMES (Jan. 7, 2015), <http://www.washingtontimes.com/news/2015/jan/7/gridlock-in-congress-rekindled-quickly-despite-dem>.

156. Hart, *supra* note 145, at 607–08.

“some concept of what the law ought to be.”¹⁵⁷ And determining what the law should be requires evaluating whether the situation is of the kind that the law seeks to prohibit. That involves drawing lines and making value judgments,¹⁵⁸ even though—maybe particularly because—the statute claims to be neutral.¹⁵⁹ Even when courts look to statutory text, judges (like scholars) cannot distill exactly what Congress meant.¹⁶⁰ That, in turn, leads to a deeper exploration of the legislative history. All in the interest of addressing whether the law answers a question Congress was not asked.¹⁶¹

There is, however, a way to try to slow the penumbra’s growth: draft the law to apply prospectively to all future technology. Though technology neutrality is frequently spoken of as flexible like a legal standard,¹⁶² the 1976 Act posited an overinclusive rule that expands to encompass, rather than adapt to, new technology. (Laws generally fall along a rules-standards spectrum¹⁶³: rules are more expensive to devise but are easier to apply and provide parties with greater adjudicative certainty; standards are cheaper to devise and lend themselves to greater fairness and flexibility but their application is more difficult and inconsistent.¹⁶⁴) A law that adapts to new

157. *Id.* at 608.

158. *See, e.g.*, *Holy Trinity Church v. United States*, 143 U.S. 457, 466–72 (1892) (acknowledging that the Court was interpreting the Alien Contract Labor Act with Christian values in mind).

159. More on the pretense of neutrality *infra* Part II.D.

160. *See* Allan C. Hutchinson & Derek Morgan, *The Semiology of Statutes*, 21 HARV. J. LEGIS. 583, 593 (1984) (“Words do not interpret themselves. A sentence will never mean exactly the same thing to any two different people or even the same thing to one person on different occasions.”); *see also id.* at 594 (“Courts that shield themselves behind descriptions of law as clear, predetermined and objective norms against which they pitch their neutral decisions are worthy of suspicion.”).

161. *Cf.* *Guisseppi v. Walling*, 144 F.2d 608, 624 (2d Cir. 1944) (Hand, J., concurring) (“As nearly as we can, we must put ourselves in the place of those who uttered the words, and try to divine how they would have dealt with the unforeseen situation . . .”).

162. *See, e.g.*, *Birnhack*, *supra* note 136, at 38 (“[T]echnology-neutral laws are equivalent to standards and the technology-specific laws are equivalent to rules.”); *Kerr*, *supra* note 62, at 1016 (“New facts will trigger new rules, but the role of the [Fourth Amendment] should remain constant regardless of technology.”).

163. *See* Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 DUKE L.J. 557, 561 n.6 (1992); Cass R. Sunstein, *Problems with Rules*, 83 CALIF. L. REV. 953, 963–64 (1995).

164. The classic example is between a rule that prohibits drivers on the highway from exceeding fifty-five miles per hour and a standard that prohibits

technologies over time must be designed to evaluate whether, and if so how, the law applies to a new technology. But the 1976 Copyright Act's technology-neutral provisions do not enable such ad hoc determinations. Judges are given no factors to consider when deciding whether copyright law applies. The statute dictates that copyright applies.¹⁶⁵ Yet, the penumbra still exists and expands, albeit more slowly, and thus judges still must determine what Congress meant the law to be. Over time, a broadly inclusive technology-neutral law's tailoring to the practices it governs becomes more tenuous, and, significantly, a different penumbra of uncertainty expands: whether the law *should* apply.

Increasingly, judges have suggested that, in some cases, the costs to innovation, and by extension social welfare, would be too severe if the technologist were not free from copyright liability and have leaned heavily on fair use.¹⁶⁶ Accordingly, the doctrine has taken on an outsized role, expanding to provide "breathing space"¹⁶⁷—not just as it historically had done for new creative expression, but also now for new technological innovations.¹⁶⁸ That, in turn, increases uncertainty about how the law *will* apply.

This judicial phenomenon began to take shape with the Betamax case.¹⁶⁹ In *Sony Corp. of America v. Universal City*

driving at an unreasonable speed. For a concise and recent discussion of the rules-standards tradeoffs, see Scott Dodson, *The Complexity of Jurisdictional Clarity*, 97 VA. L. REV. 1, 16–17 (2011); see also *id.* at 15 n.56 (providing "a very small sampling of the rich literature exploring rules and standards generally").

165. See 17 U.S.C. § 102 (2012).

166. See, e.g., *Authors Guild, Inc. v. Google Inc.*, 954 F. Supp. 2d 282, 293 (S.D.N.Y. 2013) (emphasizing the social value of Google Books), *aff'd*, 804 F.3d 202 (2d Cir. 2015).

167. *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 579 (1994).

168. Cf. Ginsburg, *supra* note 60, at 1389–91; Edward Lee, *Technological Fair Use*, 83 S. CAL. L. REV. 797, 823–24 (2010) (discussing the importance of breathing room for technological development); Fred von Lohmann, *Fair Use As Innovation Policy*, 23 BERKELEY TECH. L.J. 829, 840–41 (2008); Matthew Sag, *God in the Machine: A New Structural Analysis of Copyright's Fair Use Doctrine*, 11 MICH. TELECOMM. & TECH. L. REV. 381, 384 (2005) (discussing how fair use facilitated broader initial rights being vested in authors and "preserve[d] copyright's ability to adapt to new technology").

169. *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984). Betamax, like the peer-to-peer file-sharing cases discussed *infra* notes 208–25 and accompanying text, concerned secondary liability based on common law doctrines. Though secondary liability is not defined in the 1976 Act, it is predicated upon a primary infringement, which does arise from an exclusive right found in Section 106. See 17 U.S.C. § 106.

Studios Inc., television broadcasters and studios claimed that Sony's Betamax personal videocassette recorder infringed their copyrights by enabling users to copy television programs without permission.¹⁷⁰ A five to four Supreme Court held that Sony was not secondarily liable for copyright infringement by fashioning, from patent law, the now-famous "staple article of commerce" doctrine, which stated that the manufacturer of a device capable of infringing uses is not secondarily liable if the device is capable of a "substantial noninfringing use."¹⁷¹

The Court's mitigating liability for Sony was contingent upon determining that consumer "time-shifting"—by which an individual records a program to watch at a non-televised time—was a substantial noninfringing use.¹⁷² The majority did so by refusing to accept that Congress intended for copyright law to regulate private copying on videocassette recorders.¹⁷³ After all, that would have meant that millions of Americans were infringing copyrights.¹⁷⁴ In apparent rejection of the principles of technology neutrality, and by reference to new-technology cases decided under the technology-specific 1790, 1870, and 1909 copyright statutes, the Supreme Court declared that Congress must determine whether it wants copyright law to cover videocassette recorders now that the technology is known¹⁷⁵:

Sound policy, as well as history, supports our consistent deference to Congress when major technological innovations alter the market for copyrighted materials. Congress has the constitutional authority and the institutional ability to accommodate fully the varied permutations of competing interests that are inevitably implicated by such new technology.

In a case like this, in which Congress has not plainly marked our course, we must be circumspect in construing the scope of rights created by a legislative enactment which never contemplated such a calculus of interests.¹⁷⁶

The concerns are understandable, but practical policy does not refute Justice Blackmun's argument, in dissent, that Congress already had plainly marked the course by "chang[ing] the old pattern and enact[ing] a statute that would cover new technologies, as well as old."¹⁷⁷ Rather, it demonstrates that the

170. 464 U.S. at 420.

171. *Id.* at 442.

172. *Id.* at 456.

173. *Id.* at 454.

174. *Id.* at 456.

175. *Id.* at 430–31.

176. *Id.* at 431.

177. *Id.* at 457–58 (Blackmun, J., dissenting).

Court was concerned about the implications of Congress's ex ante technology-neutral approach.¹⁷⁸ The Supreme Court reiterated this concern in *Aereo* by noting the Transmit Clause's breadth and stating, without discussion, that, though not before the court, "the doctrine of 'fair use' can help to prevent inappropriate or inequitable applications."¹⁷⁹

Related judicial treatment of the 1976 Act's expansiveness can be seen in Judge Chin's opinion in *Authors Guild, Inc. v. Google Inc.*, holding that the wholesale copying of millions of in-copyright books by Google for its Book Search project is a fair use and therefore does not infringe the authors' copyrights.¹⁸⁰ The fair use doctrine, as codified by Section 107, directs judges to consider whether excusing an unauthorized use would further copyright policy goals.¹⁸¹ And Judge Chin did so by including a long discussion of the benefits of Google Book Search,¹⁸² he completed his fair use analysis with a normative assertion:

Google Books provides significant public benefits. It advances the progress of the arts and sciences, while maintaining respectful consideration for the rights of authors and other creative individuals, and without adversely impacting the rights of copyright holders. It has become an invaluable research tool that permits students, teachers, librarians, and others to more efficiently identify and locate books. It has given scholars the ability, for the first time, to conduct full-text searches of tens of millions of books. It preserves books, in particular out-of-print and old books that have been forgotten in the bowels of libraries, and it gives them new life. It facilitates access to books for print-disabled and remote or underserved populations. It generates new audiences and creates new sources of income for authors and publishers. Indeed, *all society benefits*.¹⁸³

In other words, Judge Chin felt that the welfare costs of subjecting Google Book Search to copyright liability made enforcement unreasonable: Google's unauthorized copying must be excused.

178. Cf. Andrew Tutt, *Textualism and the Equity of the Copyright Act: Reflections Inspired by American Broadcasting Companies, Inc. v. Aereo, Inc.*, 89 N.Y.U. L. REV. ONLINE 1, 7 (2014) (arguing that though "[t]he enactors of the Copyright Act certainly would have thought that the 'over-engineered[,] 'Rube Goldberg-like contrivance' should be sacrificed to the copyright gods," doing so would undermine copyright policy values).

179. *Am. Broad. Cos., Inc. v. Aereo, Inc.*, 134 S. Ct. 2498, 2511 (2014).

180. 954 F. Supp. 2d 282, 294 (S.D.N.Y. 2013).

181. See Greenberg, *supra* note 45, at 106–08.

182. *Authors Guild*, 954 F. Supp. 2d at 287–88.

183. *Id.* at 293 (emphasis added). To be sure, Judge Chin also found that the four statutory factors weigh "in favor of a finding of fair use." *Id.*

Technology neutrality also is an element of Canadian copyright law, and played an important role in five copyright cases that the Canadian Supreme Court decided in July 2012.¹⁸⁴ Looking at these cases, Carys Craig indirectly offers a possible explanation for the dramatic expansion of the fair use doctrine in U.S. copyright law.¹⁸⁵ Craig posits that, in Canada, a third purpose of technology neutrality is serving as a basis for maintaining the copyright owner-user balance that has three centuries of analog development—and thereby as a justification for “circumscribing the potential reach of existing owners’ rights where their extension threatens to upset copyright’s fragile balance in the digital domain.”¹⁸⁶ Conceptually, something similar could be happening with the judicial expansion of the fair use doctrine for new technologies, though, to be sure, the 1976 Copyright Act is silent on whether fair use is to be technology neutral or technology specific.

The interaction between neutrality amplifying uncertainty and courts’ increasingly heavy reliance on fair use has resulted in an awkward dance. Authors initially receive broad rights, which presumably factored into ex ante incentives, but courts subsequently reduce entitlements ex post. One consequence is that copyright owners are increasingly displeased with copyright law and, in turn, are lobbying Congress to revise the law. On the other hand, when use-specific exceptions are denied, technologists are the ones who push law reform. Both scenarios undermine the premise that technology neutrality can promote statutory longevity.

C. PROBLEM OF PERSPECTIVE

Beyond courts choosing to not apply technology-neutral laws in an equivalent manner to future technologies because of normative concerns, the nature of the 1976 Act hinders judges

184. See *Entm’t Software Ass’n v. Soc’y of Composers, Authors & Music Publishers of Can.*, [2012] 2 S.C.R. 231; *Rogers Comms. Inc. v. Soc’y of Composers, Authors & Music Publishers of Can.*, [2012] 2 S.C.R. 283; *Soc’y of Composers, Authors & Music Publishers of Can. v. Bell Can.*, [2012] 2 S.C.R. 326; *Alberta (Education) v. Canadian Copyright Licensing Agency (Access Copyright)*, [2012] 2 S.C.R. 345; *Re:Sound v. Motion Picture Theatre Ass’ns of Can.*, [2012] 2 S.C.R. 376.

185. See Carys J. Craig, *Technological Neutrality: (Pre)Serving the Purposes of Copyright Law*, in *THE COPYRIGHT PENTALOGY*, *supra* note 63, at 271–72. Her claim is indirect because it is broader and because Canadian copyright law lacks the fair use doctrine; instead, it has the analog of fair dealing.

186. *Id.* at 299.

from applying the law to new technologies in a consistent manner. Discrepancies appear both within and across technologies. It is not enough to say that a law applies to a new technology in the same manner it applied to the old technology when the new technology might present a secondary locus of inquiry. A close examination shows that incongruences in content-technology disputes often turn on how a court conceptualizes the relevant technology and whether the court looks to mechanical limitations—the structure and process of the technological system—or only to the technological byproduct. That is, judges often formalistically adjudge a technology as infringing or noninfringing without looking at what the technology accomplishes; instead, judges often look at how the technology operates.

This is the problem of perspective¹⁸⁷—the distortion that occurs when new technologies introduce a new locus of inquiry. The 1976 Act’s instruction to treat new technology as legally equivalent to old technology creates such a problem.¹⁸⁸ The structural perspective in copyright law looks inside the machine at the technological design or process; the behavioral perspective looks only at the technological output—at what, not how. Inconsistent judicial treatment of new technologies suggests that courts are not answering the same question when determining when and how copyright law applies to a new technology. Put another way: different judges have different perspectives on the universe of material facts. And, in many cases, that perspective determines the applicable copyright doctrine, if any, and whether it is adverse to the technology.

The recent litigation over broadcast retransmitter Aereo demonstrates how legal outcomes at times hinge on different foci in evaluating the same technology. Courts in different circuits split over whether Aereo’s technology made a public performance of copyrighted content and thereby infringed the Transmit Clause in Section 106(4).¹⁸⁹ A key question for some judges was why Aereo used thousands of dime-sized personal

187. The idea that new technologies can introduce parallel perspectives was first articulated by Orin Kerr in the context of cyberlaw. See Orin S. Kerr, *The Problem of Perspective in Internet Law*, 91 GEO. L.J. 357, 357 (2003). He argued that perspective often is legally determinative and “many of the major disputes within the field of ‘cyberlaw’ boil down to clashes between internal and external perspectives.” *Id.*

188. The problem of perspective can exist in other laws, but it is particularly problematic in technology-neutral laws because it undermines equivalence.

189. See cases cited *supra* note 151.

antennae rather than a single antenna like the kind used for cable retransmission.¹⁹⁰ Was there a technological benefit or was it a copyright workaround?¹⁹¹ For other judges, Aereo's rationale was irrelevant; what mattered was that the personal-antenna technology ensured that every transmission, to these judges, was privately performed.¹⁹² That is, the personal antennae made thousands of personal copies of each captured program, thereby enabling Aereo to transmit thousands of one-to-one performances to specific subscribers; a single antenna either would have made these performances public in real time or would have subjected them to the single-copy aggregation exception in transmission.¹⁹³

A divided panel of the Second Circuit illustrates the structural and behavioral perspectives¹⁹⁴—and how the choice of perspective undermines the premise of technology neutrality. The panel majority found significant that Aereo assigned each subscriber a personal antenna:

The feed from that antenna is not used to generate multiple copies of each program for different Aereo users but rather only one copy: the copy that can be watched by the user to whom that antenna is assigned. Thus even if we were to disregard Aereo's copies, it would still be true that the potential audience of each of Aereo's transmissions was the single user to whom each antenna was assigned.¹⁹⁵

The individual antennae, the court said, made the transmissions to each subscriber akin to the uncontrovertibly private transmission of an antenna placed on top of each subscriber's home.¹⁹⁶ And because that antenna is individual to the subscriber, "the entire chain of transmission from the time a signal is first received by Aereo to the time it generates an image the Aereo user sees has a potential audience of only one Aereo cus-

190. See, e.g., *WNET, Thirteen v. Aereo*, 712 F.3d 676, 696 (2d Cir. 2013) (Chin, J., dissenting).

191. There is a third possibility: the thousands of antennae represented a technologically beneficial copyright workaround. See Dan L. Burk, *Inventing Around Copyright*, 109 NW. U. L. REV. 547, 550 (2015).

192. See *Am. Broad. Cos. v. Aereo, Inc.*, 874 F. Supp. 2d 373, 396 (S.D.N.Y. 2012).

193. Cf. James Grimmelman, *Why Johnny Can't Stream: How Video Copyright Went Insane*, ARS TECHNICA (Aug. 30, 2012), <http://arstechnica.com/tech-policy/2012/08/why-johnny-cant-stream-how-video-copyright-went-insane/> 2 ("Pause to note what a silly distinction this is.").

194. *Aereo*, 712 F.3d at 676 (affirming the denial of a preliminary injunction in part because transmissions of "live" Internet broadcasts likely were not public performances).

195. *Id.* at 693.

196. *Id.*

tomers.”¹⁹⁷ By closely inspecting Aereo’s technology, the court found no way that Aereo could be infringing the Transmit Clause, regardless of how Aereo’s service appeared from a thirty-thousand-foot view that saw only the technological output.¹⁹⁸

In contrast, Judge Chin’s dissent looked beyond Aereo’s technology, which he characterized as “a sham”—“a Rube Goldberg-like contrivance, over-engineered in an attempt to avoid the reach of the Copyright Act and to take advantage of a perceived loophole in the law.”¹⁹⁹ He criticized the majority for focusing on Aereo’s technical architecture and, thereby, “elevat[ing] form over substance.”²⁰⁰ Arguing that Aereo infringed the broadcasters’ copyrights, Judge Chin concentrated on the nature of Aereo’s technology-based service, on the product it delivers; not on the path it travels.²⁰¹ Moreover, Judge Chin argued that the broad language of the 1976 Act covers “any device or process,” and that included Aereo’s technology.²⁰² Whether Aereo used one antenna or one million was irrelevant. “Because Aereo is transmitting television signals to paying strangers, all of its transmissions are ‘to the public,’ even if intervening ‘device[s] or process[es]’ limit the potential audience of each separate transmission to a single ‘member[] of the public.’”²⁰³

The Supreme Court reversed the Second Circuit, holding that Aereo infringed Section 106(4) because, based on its technological output, Aereo resembled a cable-like system.²⁰⁴ The Court focused on the purpose of the 1976 Act, specifically Congress’s stated intent to abrogate prior Supreme Court decisions holding that cable companies did not perform copyrighted

197. *Id.*

198. *Id.* at 696.

199. *Id.* at 697. Not surprisingly, Aereo proclaimed that its business model was devised to avoid copyright liability. See Brian Fung, *Aereo: Yes, We’re a Rube Goldberg Device. And We’re Proud of It.*, WASH. POST (Mar. 27, 2014), <https://www.washingtonpost.com/news/the-switch/wp/2014/03/27/aereo-yes-were-a-rube-goldberg-device-and-were-proud-of-it/> (“Exploiting loopholes is the whole point, the company says.”).

200. *Aereo*, 712 F.3d at 697.

201. *Id.* at 704–05.

202. *Id.* at 698 (citing 17 U.S.C. § 101 (2012)) (emphasis in opinion).

203. *Id.* at 699; see also *WNET, Thirteen v. Aereo, Inc.*, 722 F.3d 500, 512 (2d Cir. 2013) (Chin, J., dissenting) (“Courts should follow Congress’s lead and resist the urge to look ‘under the hood’ at how these processes technically work.”), *denying reh’g en banc of* 712 F.3d 676 (2d Cir. 2013).

204. *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498, 2511 (2014).

works and were thus outside the 1909 Act's reach.²⁰⁵ Despite Aereo's aim to technologically manipulate all performances to be private, the Court explicitly stated that traditional cable retransmission systems and Aereo's one-to-one system were effectively equivalent. Technological variations, the Court said, were irrelevant because "[t]hey concern the behind-the-scenes way in which Aereo delivers television programming to its viewers' screens."²⁰⁶ The Supreme Court's decision approximates a behavioral perspective, though it is colored by other perspectives: defendant's purpose and viewer's experience.²⁰⁷

Additionally, the problem of perspective, to the extent it invites structural inquiries, even if inconsistent, pushes technological innovation toward exploiting legal ambiguity or silence. Peer-to-peer litigation tells the story of how iterative technologies might be designed in an effort to skirt liability while facilitating proscribed activities.²⁰⁸ Napster, Aimster, and Grokster—three early peer-to-peer file-sharing services—varied technologically but offered the same general service: enabling a user to share a file in his possession with other users who wanted a copy. The services were "[p]erhaps the most conspicuous attack on property rights" to emerge in the digital age,²⁰⁹ used overwhelmingly for the unauthorized sharing of copyright-protected music,²¹⁰ which the recording industry vehemently opposed on numerous fronts. One front was litigation, and, despite effectively similar technology, Napster,²¹¹ Aimster,²¹² and Grokster²¹³ each lost on a different basis.

205. *Id.* at 2504–07 (discussing *Teleprompter Corp. v. Columbia Broad. Sys., Inc.*, 415 U.S. 394 (1974); *Fortnightly Corp. v. United Artists Television, Inc.*, 392 U.S. 390 (1968)) ("Aereo's activities are substantially similar to those of the [community antenna television] companies that Congress amended the Act to reach.").

206. *Id.* at 2508.

207. *Id.* (stating that technological variations "do not render Aereo's commercial objective any different from that of cable companies").

208. See generally REBECCA GIBLIN, *CODE WARS: 10 YEARS OF P2P SOFTWARE LITIGATION* (2011).

209. STUART BANNER, *AMERICAN PROPERTY: A HISTORY OF HOW, WHY, AND WHAT WE OWN* 279 (2011).

210. See, e.g., *In re Napster, Inc. Copyright Litig.*, 377 F. Supp. 2d 796, 806 (N.D. Cal. 2005) (noting "evidence . . . suggesting that almost 15 billion files were downloaded by Napster users" during a nine-month period); *A&M Records, Inc. v. Napster, Inc.*, 114 F. Supp. 2d 896, 902 (N.D. Cal. 2000) ("Approximately 10,000 music files are shared per second using Napster . . .").

211. See *A&M Records, Inc. v. Napster, Inc.*, 239 F.3d 1004 (9th Cir. 2001).

212. See *In re Aimster Copyright Litig.*, 334 F.3d 643 (7th Cir. 2003).

213. See *MGM Studios Inc. v. Grokster, Ltd.*, 545 U.S. 913 (2005).

The saga began with the Ninth Circuit holding Napster secondarily liable for copyright infringement.²¹⁴ Central to the court's decision was that Napster had reasonable knowledge of infringing file-sharing and had the right and ability to prevent such activity; the former was a key element of contributory liability, the latter of vicarious liability. Both turned on Napster's technological design, which contained a central index that users searched for files they wanted to copy.²¹⁵ But focusing on knowledge and control had the unintended consequence of motivating other file-sharing services to design systems lacking those elements without putting in place features to limit the infringing uses that drove the *Napster* litigation. Aimster responded to Napster's legal troubles by distributing encryption software that all users needed to share files. (Though the Seventh Circuit still held Aimster liable because it intentionally "blinded itself" in an effort to skirt liability where it otherwise knew it existed,²¹⁶ the Court suggested that encryption technology could shield from liability a peer-to-peer service that lacked "actual knowledge of the unlawful purposes for which the service is being used."²¹⁷) Grokster, promoting itself as an alternative to Napster, met the same fate but on a distinct legal basis.²¹⁸ Unlike Napster, Grokster did not use a central server or index; using the Grokster software, computers communicated with each other through supernode indexing computers.²¹⁹ Unlike Aimster, Grokster did not encrypt peer-to-peer files; Grokster "use[d] no servers to intercept the content of the search requests or to mediate the file transfers conducted by users of the software,"²²⁰ and thereby did not know when files were copied. Thus, the Supreme Court could not find Grokster liable for contributory infringement, unless on the basis of willful blindness; vicarious liability also was unlikely.²²¹ According-

214. *Napster*, 239 F.3d at 1020, 1024.

215. However, users did not upload files to Napster's central server. Files remained on a user's computer until another user requested them. That communication was routed through the central server.

216. *Aimster*, 334 F.3d at 653.

217. *Id.* at 650–51.

218. *Grokster*, 545 U.S. at 925–26. The case also involved Streamcast's similar Morpheus peer-to-peer software. The following discussion applies to both, but I reference only Grokster for simplicity.

219. *Id.* at 921.

220. *Id.* at 922.

221. The Court declined to analyze vicarious liability, *id.* at 930 n.9, but control was lacking and it is unlikely that the Court would have found

ly, the Court looked to a record “replete” with evidence that Grokster sought “to satisfy a known source of demand for copyright infringement”²²² and decided to adopt from patent law the inducement of infringement doctrine.²²³

In each case, the court was concerned that a peer-to-peer technology facilitated materially similar infringement on a “massive scale.”²²⁴ However, because technological designs varied, the courts thought that different legal doctrines must apply, regardless of whether those variations had any practical effect on infringing uses. Each decision provided a later-mover with a blueprint for avoiding copyright liability—for “exploit[ing] the gaps between technological possibilities and the self-described boundaries of law”²²⁵—without guarding against the very infringement that led to liability in the earlier case(s). And all without serving the societal interests that Congress presumed when it declared that copyright law would apply to all future copyright-using technologies.

In the 1976 Act, the statutory language and legislative history are not explicit about the proper perspective. But, against the backdrop of technology neutrality’s general principles, the nature of the 1976 Act’s default rights and the legislative history suggest that Congress generally wanted judges to adopt a behavioral perspective, to focus on technological output, not process or design. That was how Congress, in the words of Justice Blackmun, intended to “change the old pattern and enact a statute that would cover new technologies, as well as old.”²²⁶ I give this matter full consideration elsewhere.²²⁷

More generally, though in technology-neutral laws the problem of perspective can be mitigated with explicit statutory language about the proper perspective, the specter of the problem likely will remain. Even assuming that a statute indicated

Grokster’s decentralized network to rise to the level of the willful blindness in *Aimster*.

222. *Id.* at 938–39.

223. *Id.* at 936–37.

224. *In re Aimster Copyright Litig.*, 252 F. Supp. 2d 634, 638 (N.D. Ill. 2002); *see supra* note 31.

225. Depoorter, *supra* note 28, at 1864; *see also* Tim Wu, *When Code Isn’t Law*, 89 VA. L. REV. 679, 682 (2003) (“The programmer is not unlike the tax lawyer, exploiting differences between stated goals of the law, and its legal or practical limits. He targets specific weaknesses in legal regimes . . .”).

226. *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 457–58 (1984) (Blackmun, J., dissenting).

227. *See Greenberg, supra* note 15.

a behavioral perspective and that courts consistently eschewed the structural perspective, some courts might alter the behavioral perspective as the *Aereo* Court seemed to do, imbuing upon it additional lenses such as the technologist's "commercial purpose" and the viewer's experience.²²⁸ This raises concerns about whether neutrality is even possible.

D. PROBLEM OF PRETENSE

The 1976 Act, as enacted, included several technology-specific provisions, indicating that Congress did not actually believe all technologies should be treated the same—but those provisions are not the only non-neutral aspects of the statute. The technology-neutral provisions are not, in fact, neutral either.²²⁹ A neutral law is said to be impartial and unbiased in application,²³⁰ but technology neutrality has earlier steps: the legislative process that crafts the boundaries of technology-neutral provisions and the interpretative construction that reduces content-technology conflicts to legal controversies.²³¹ Neither process is neutral; both are shaped by social and political context.²³² This is technology neutrality's problem of pretense—it holds out neutrality as *neutral*.

A technology-neutral statute's step zero begins with choosing the technologies to which a neutral law will be applied. For example, copyright law might be broadly or narrowly inclusive of new technologies. Does technology neutrality mean every technology now known or later developed? Or every communications technology now known or later developed? Or every communications technology with X, Y, and Z characteristics,

228. See *A&M Records, Inc. v. Napster, Inc.*, 239 F.3d 1004, 1018 (9th Cir. 2001).

229. That purportedly neutral laws are laden with values is a classic claim of the critical legal studies movement. See Roberto Mangabeira Unger, *The Critical Legal Studies Movement*, 96 HARV. L. REV. 561 (1983); see also James Boyle, *The Politics of Reason: Critical Legal Theory and Local Social Thought*, 133 U. PA. L. REV. 685 (1985); Jonathan Turley, *Introduction: The Hitchhiker's Guide to CLS, Unger, and Deep Thought*, 81 NW. U. L. REV. 593 (1987). Surprisingly, this claim had not, to my knowledge, been extended to technology neutrality.

230. See, e.g., *Neutral*, BLACK'S LAW DICTIONARY (9th ed. 2009).

231. See Mark Kelman, *Interpretive Construction in the Substantive Criminal Law*, 33 STAN. L. REV. 591, 592 (1981).

232. And as Jessica Litman has shown, the broad terms that formed the 1976 Act's technology-neutral provisions were driven by the incumbent-parties negotiation process that characterized the revision. Litman, *supra* note 28, at 281.

now known or later developed? Choosing among the options reflects different beliefs about the role of copyright law in protecting authors and enabling technologists. The legislative history of the 1976 Act is overt about Congress's value-laden goals for technology neutrality: it sought to grant authors control over new markets, to protect the author against "his copyright los[ing] much of its value because of unforeseen technical advances."²³³ Congress therefore chose broad terms and per se inclusion of future technologies.

That is an understandable decision—the propriety of which invokes the discussion in Part I about utilitarian copyright—but it is not neutral. The choice of perspective also is illustrative. Legislators (or, in the absence of statutory clarity, courts) can adopt a structural perspective or behavioral perspective (or something else). That decision is based, at least in part, on whether the decisionmaker thinks that the law should proscribe disfavored technological processes or technological outputs.²³⁴ Similarly, how judges answer penumbral questions is shaped by non-neutral values.²³⁵

More importantly, because laws regulating unforeseen technologies are drafted with extant technologies in mind, neutral application might, in fact, discriminate against a new technology. That would seem to undermine technology neutrality's goal of doctrinal equivalence. For example, the Supreme Court in *Aereo* said that Congress drafted Section 106(4) to cover "an entity that acts like a CATV [cable] system."²³⁶ The Court found that *Aereo* looked like a cable system, but the Court explicitly refused to address the implications of its ruling on related technology.²³⁷ At a high level of abstraction, *Aereo* was

233. SUPPLEMENTARY REPORT, *supra* note 82, at 14.

234. Cf. Richard A. Posner, *The Jurisprudence of Skepticism*, 86 MICH. L. REV. 827, 852 (1988) (stating, in the context of "means-ends rationality" that "[t]he choice between alternative legal rules often depends on deciding which one makes a better fit to some underlying legal goal"); Adrian Vermeule, *Interpretive Choice*, 75 N.Y.U. L. REV. 74, 76 (2000) ("Interpretive choice is a choice among possible means to attain stipulated ends.").

235. See *supra* notes 156–60.

236. *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498, 2506 (2014).

237. *Id.* at 2510–11 ("We cannot now answer more precisely how the Transmit Clause or other provisions of the Copyright Act will apply to technologies not before us. We agree with the Solicitor General that '[q]uestions involving cloud computing, [remote storage] DVRs, and other novel issues not before the Court, as to which "Congress has not plainly marked [the] course," should await a case in which they are squarely presented.'"); see also Rebecca Giblin & Jane C. Ginsburg, *We (Still) Need To Talk About Aereo: New Contro-*

another broadcast retransmitter, the type of unforeseen technology that Congress could have had in mind when debating Section 106(4). But upon closer review, Aereo also looks like a very different technology that would have been much further removed from Congress's imagination: cloud computing services like Dropbox. If cloud computing is like Aereo and Aereo is like cable systems, should Section 106(4) apply the same to cloud computing as to early cable technologies? Or would doing so actually discriminate against cloud computing, thereby undermining technology neutrality?

The problem of pretense is unlike the discriminatory nature of technology specificity. Its discrimination, if normative, is inadvertent, not tailored to policy goals. In some areas technology neutrality runs the risk of entrenching existing markets and handicapping more efficient or dynamic technologies.²³⁸ In copyright law, for example, technology neutrality entangles granting authors exclusive control over exploitation of their work with protecting existing markets from new markets of exploitation—and that imposes social costs without necessarily conferring benefits to authors.²³⁹

Finally, the pretense of neutrality magnifies the stresses that new technologies place on the law in three ways. Structurally, a technology-neutral statute is more prone to providing limited judicial guidance because legislators assume that making the law technology neutral in name suffices to make the law adaptable to new technology. Practically, a technology-neutral statute gives legislators the false impression that the law will not require legislative recalibration or reconsideration in response to new technology. And, administratively, the law might lack needed institutional tools for promoting tailored adaptation and equivalence. Each is visible in the 1976 Act, which provides judges with little guidance for determining whether a new technology is equivalent to an old technology; creates the illusion of technology-specific amendments being unnecessary, from which Congress responded to emerging content-technology

versies and Unresolved Questions After the Supreme Court's Decision, 38 COLUM. J.L. & ARTS 109, 132–39 (2015) (discussing the uncertain implications of Aereo for “cloud storage, Slingboxes, ‘tablet TVs’ and live TV streaming”).

238. See, e.g., Raymond Shih Ray Ku, *Grokking Grokster*, 2005 WIS. L. REV. 1217 (suggesting that technology neutrality may have been about technology entrenchment, basically ensuring that the incumbent distributors could remain powerful even when new, more efficient vehicles arose for disseminating content).

239. See Balganes, *supra* note 46, at 1589–91.

conflicts with conflict-specific resolutions that did not consider the broader technological implications; and neglects to designate an institution for timely and tailored adjustments of copyright.

III. TOWARD TECHNOLOGICAL DISCRIMINATION

The discussion in Part II illuminates unappreciated shortcomings of technology-neutral drafting generally and its implementation in the 1976 Copyright Act specifically. The problem of prediction is unavoidable for laws governing technology-dependent fields, often resulting in poor tailoring of laws to future technologies—both known unknowns and, especially, unknown unknowns. Similarly, the problem of the penumbra suggests that courts will resist technology-neutral laws because as time passes and technology advances further into the unknown unknowns, it becomes less clear that the law should apply—and that leads to uncertainty about how the law actually will apply. Additionally, judges either cannot or do not apply technology-neutral laws in an equivalent and consistent manner. The problem of perspective, though not unique to technology-neutral laws, can cause more damage therein; when multiple possible perspectives exist, it leads to inconsistent judicial treatment of substantively similar technologies, as illustrated by *Aereo* and the peer-to-peer file-sharing cases, and thereby undermines the goal of equivalence. And the problem of pretense causes technology-neutral provisions to be based on non-neutral determinations favoring old technologies and business models.

There are numerous possible alternatives to pure technology neutrality. One, as Michael Birnhack notes, is to “replace a dichotomous approach with a series of continuums that form a complex legislative matrix.”²⁴⁰ And, in reality, laws typically are infused with both neutrality and specificity, at least conceptually. As discussed in Part II.D, even when technology neutrality is desirable and achievable, the law only is *neutral* in its treatment of technologies that fit within *specific* criteria. Like with rules and standards, legal provisions fall on a spectrum of technology neutrality and specificity. This Part proffers that making copyright law more technology specific would better facilitate the goals of technology neutrality. It offers a proposal

240. Birnhack, *supra* note 136, at 36; *see also* Ohm, *supra* note 62, at 1687–88.

that overtly abandons the pretense of neutrality and instead embraces the concept of technological discrimination.

The claim is not that technology-neutral laws—that is, any law drawn to general technological characteristics—are fatally flawed. The four problems of technology neutrality appear to varying degrees in different types of laws—dependent on, *inter alia*, the field of law and the nature of the relevant technology-neutral provision.²⁴¹ Likewise, not all technology-specific laws promote policy goals. Copyright law’s pre-1978 experience with extreme technology specificity demonstrates the significance of the statutory and institutional context.

Rather, laws should be *more* technology specific—that is, they should discriminate among technologies and technological classes in the furtherance of policy goals. This is what I call “domain-specific neutrality.” Within this rubric, a law might be drawn to “pens and pencils” or to “a handheld device, substantively equivalent to a pen or pencil, for writing.” But the law would not be drawn to the poles of specificity and neutrality: e.g., “red ball-point pens” or “all technology, now known or later developed, capable of producing a writing that can be perceived either directly or with the aid of a machine or device.” The defaults in copyright law, to this point, have been set at such extremes. Instead, copyright law should embrace technological discrimination: neutral treatment of all technologies that fit within a character-specific domain.

Though technology specificity has long been criticized as prone to under-inclusiveness, antiquation, and obsolescence,²⁴² such failings are not inescapable features of technology-specific laws. They arise in certain contexts and can be mitigated by alternative approaches to lawmaking and adjudication. The key to better technology-specific laws is congressional recognition that other institutions are needed to help adapt the law to technological change. Courts play an important but likely incomplete role in technological discrimination; an agency probably would be necessary too. Courts need to take on a bigger role in determining whether copyright law applies, in the first instance, to new technologies. That is, does copyright law regulate use of copyrighted works in the new technology? Additionally, Congress could empower an administrative agency to issue clear and targeted rules for whether and how copyright

241. More on that, immediately below.

242. *Cf. Moses, supra* note 67, at 266–68; Sunstein, *supra* note 163, at 993.

law applies to new technologies.²⁴³ The agency also would be useful for setting compulsory license rates for technologies not subject to the copyright owner's exclusive right.²⁴⁴

Within this institutional lattice, discrimination can be normative by responding to the costs and benefits of specific technologies rather than being determined *ex ante* by technology-neutral rules. This Part shows how technological discrimination, meted out by courts and an agency, could produce clearer outcomes in content-technology disputes while leaving less uncertainty about related technologies. It then makes the case for technological discrimination.

A. ONE PROPOSAL

Technological discrimination should be designed to avoid the unintended consequences of technology neutrality *and* to promote the general policy goals that motivate technology-neutral laws. Better legislative drafting tools would promote statutory longevity and doctrinal equivalence, but only to the extent that doing so did not generate the phenomena that undermine technology neutrality's normativity.²⁴⁵ It also would enable non-legislative adaptation of the law to new technologies and would recognize when new technologies should be treated differently from old technologies. Such a system would foster technology neutrality's goals only when those goals are, in fact, socially valuable; when not, it would adapt the law accordingly.

My proposal advises moving copyright law away from its inadvertent technological mindset, shaped by old business models, of the distinct Section 106 exclusive rights;²⁴⁶ using narrower, but flexible, terms to define covered technologies, rather than the all-inclusive definitions currently in Section

243. This should not raise nondelegation doctrine concerns, as Congress would do the heavy lifting by defining the statutory categories and authorizing the agency to determine the specific technologies that fit within those categories, using both the technological standards and broadly defined policy principles that Congress includes in the statute.

244. That would be important for freeing technologists from potential hold-up demands while also ensuring that authors still receive some compensation for technologies that the statute does not speak to.

245. Carys Craig argues that *substantive* technology neutrality—that is, applying the law so that it does not discriminate against or favor specific technologies—is socially beneficial, Craig, *supra* note 185, at 272–74, and I agree. But the 1976 Copyright Act, as drafted, does not allow for substantive technology neutrality. Its statutory tools are too blunt and prospectively applicable.

246. 17 U.S.C. § 106 (2012).

101,²⁴⁷ and adopting workable mechanisms for adapting copyright law to new technologies. How might this be operationalized? I offer the following hypothetical revision to copyright law for illustration; it is intentionally incomplete.

My proposal begins with Congress replacing the technology-neutral language of the exclusive rights and statutory definitions with something like this as a revised Section 106:

Subject to limitations in Sections 107–122, the owner of a copyright under this title has the exclusive right to economic exploitation of the copyrighted work in covered technologies.

Covered technologies are the following and those substantively equivalent:

- (1) Devices or systems, substantively equivalent to a video cassette recorder or camera, for recording audiovisual works;
- (2) Devices, substantively equivalent to broadcast or cable transmission, for communicating audiovisual works to the public;
- (3) . . . (15)
- (16) Devices, substantively equivalent to peer-to-peer networks, for sharing audiovisual works.

(c) Copyright-using technologies not within 106(b) shall be subject to a compulsory licensing regime.

Elsewhere in the statute, Congress would add technology-specific provisions tailored to the unique social costs and benefits of select technologies known at the time of the statute's drafting. Cloud computing might be such a technology.²⁴⁸ Assume, for discussion below, that a cloud-specific provision exempts cloud storage and transmission from copyright liability.

Under this scheme, the statute would be technology neutral with regard to the general default control copyright grants authors, but it would be *more* technology specific as to how those control rights apply to individual copyright-using technologies. This is similar to Article 10 of the WIPO Copyright Treaty (WCT). In telling treaty members what copyright limi-

247. *Id.* § 101.

248. See David Kravets, *Analysis: Aereo's Death Leaves Cloud Computing Hanging in the Balance*, ARS TECHNICA (June 25, 2014, 4:36 PM), <http://arstechnica.com/tech-policy/2014/06/analysis-aereos-death-leaves-cloud-computing-hanging-in-the-balance> ("Experts disagree on whether the decision opens up a cloud-computing Pandora's box."); see also *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498, 2511 (2014) ("We cannot now answer more precisely how the Transmit Clause or other provisions of the Copyright Act will apply to technologies not before us. We agree with the Solicitor General that '[q]uestions involving cloud computing, [remote storage] DVRs, and other novel issues not before the Court, as to which Congress has not plainly marked [the] course, should await a case in which they are squarely presented.'").

tations and exceptions they may permit, the WCT focuses on “certain special cases that do not conflict with a normal exploitation of the work and do not unreasonably prejudice the legitimate interests of the author.”²⁴⁹ Note that WCT Article 10 does not mention the right of distribution or the right of rental or the right of communication to the public, nor the economic rights provided for by the Berne Convention (e.g., reproduction, translation, adaptation). The standard for limitations and exceptions is concerned only with the economic exploitation.

The statute also would authorize an administrative agency to perform three supporting tasks: (1) clarify whether a new technology is subject to the proposed Section 106(b); (2) set licensing rates for copyright-using technologies not subject to the proposed Section 106(b); and (3) create statutory exceptions, as appropriate, for the same. With the burden on the party moving for a rulemaking, technologists likely would be motivated to either negotiate with copyright owners (under the expectation that the new technology will fit within the proposed Section 106(b)) or to move for a rulemaking (based on a belief that the new technology should only be subject to a compulsory license).

1. The Role of Courts

Courts would factor prominently in adapting copyright law to new technologies. They would, effectively, broaden authors’ control over new markets as appropriate by determining whether a new technology was substantively equivalent to a covered technology.²⁵⁰ Such technological discrimination can be thought of as domain-specific neutrality—that is, neutral treatment of all technologies that fit within a domain bounded by certain characteristics and specifications.

The linchpin of this process is the substance-over-form analysis by which a new technology is deemed to be similar to a covered technology. Though Congress, in the 1976 Act, evinced a concern over judicial formalism,²⁵¹ judges had already become more comfortable with functional application of the law—with

249. WIPO Copyright Treaty, *supra* note 64, art. 10(1), (2).

250. The analogizing would reference back both to statutorily enumerated technologies and technology types in the proposed Section 106(b) and also to case law that had already adapted copyright law to previous new technologies.

251. By indicating in the statute that all copyright-using technologies are functionally similar, Congress forced judges to be functionalists to the extreme of formalism.

adapting, by analogy, old laws to new technologies.²⁵² It is not, for example, apparent that digitally compressed music would have been outside the copyright system absent the 1976 Act's technology-neutral language, as courts applying the 1909 Act had moved away from the formalism of *White-Smith Music*.²⁵³ Though these courts often insisted that a copyrighted work fit into one of the fourteen enumerated subject-matter categories for registration with the Copyright Office,²⁵⁴ courts shoehorned some new types of works into old authorship categories. In such cases, new wine did not actually need a new wineskin.

A notable example is that of films, or, as they were then known, moving pictures. That old-fashioned term of art tells a great deal about the theory on which moving pictures were granted copyright protection. Section 5 of the 1909 Act made no mention of moving pictures (or any other applicable term) until 1912,²⁵⁵ but lower courts had recognized the copyright of films since at least 1903.²⁵⁶ Considering courts' adherence to only affording copyright to works that could fit into Section 5, what explains this? Simply, courts became more comfortable with analogizing a new use or type of work to a statutorily enumerated one. Under a judicial philosophy that looks beyond statu-

252. Of course, there are exceptions, as evidenced by the Second Circuit majority in *WNET, Thirteen v. Aereo, Inc.*, 712 F.3d 676 (2d Cir. 2013). See *supra* notes 189–206 and accompanying text.

253. *White-Smith Music Publ'g Co. v. Apollo Co.*, 209 U.S. 1 (1908). *White-Smith Music* was decided amid “formalism’s heyday.” HENRY M. HART, JR. & ALBERT M. SACKS, *THE LEGAL PROCESS: BASIC PROBLEMS IN THE MAKING AND APPLICATION OF LAW* lv (William N. Eskridge, Jr. & Philip P. Frickey eds., 1994).

254. Notwithstanding the express statement that Section 5 “shall not be held to limit the subject-matter of copyright as defined in section four,” which bounded copyrightability broadly as “all the writings of an author.” Copyright Act of 1909, ch. 320, §§ 4, 5, 35 Stat. 1075 (superseded by Copyright Act of 1976, Pub. L. No. 94-553, 90 Stat. 2541).

255. Townsend Amendment, Act of 1912, ch. 356, Pub. L. No. 62-303, § 5(l), 37 Stat. 488; see also PATRY, *supra* note 106, § 1:47.

256. See, e.g., *Harper & Bros. v. Kalem Co.*, 169 F. 61, 64–65 (2d Cir. 1909); *Edison v. Lubin*, 122 F. 240, 242–43 (3d Cir. 1903). Similarly, judicial decisions demonstrated a broad interpretation of a “book.” See, e.g., *White-Smith Music Publ'g Co.*, 209 U.S. at 14; see also U.S. COPYRIGHT OFFICE, BRIEFING PAPERS ON CURRENT ISSUES RAISED BY H.R. 2223, MAY 7, 1975, as reprinted in *Copyright Law Revision: Hearings on H.R. 2223 Before the Subcomm. on Courts, Civil Liberties & the Admin. of Justice of the H. Comm. on the Judiciary*, 94th Cong. 2053 (1975) (describing the exclusive rights provisions as “broad”); Jessica D. Litman, *Copyright, Compromise, and Legislative History*, 72 CORNELL L. REV. 857, 858 (1987) (“By the time Congress replaced the 1909 Act, courts had embroidered the old statute with a wealth of common law interpretation.”).

tory text to congressional intent, which became common practice in the early 1940s,²⁵⁷ digitally compressed music (and audiobooks) could have been analogized to musical compositions (and books or dramatic compositions) in the 1909 Act, even though they were not expressly mentioned and had distinct features.²⁵⁸ Of course, a law that is neutral as to the form of copies provides greater certainty for copyright owners. But it is unclear that digitally compressed music needed technology neutrality to be covered by copyright. More critically, it needed a lack of legal formalism.

Using an open-ended standard to define a technological domain (e.g., “equivalent to a pen or pencil” or “equivalent to a video cassette recorder or camera”) would help courts avoid formalism.²⁵⁹ Technology-specific standards would make the law more flexible by basing the law’s application on relevant characteristics, as assessed after the technology is known, rather than *ex ante* categorical inclusion.²⁶⁰ Such standards also would help promote equivalence by enabling judges to evaluate

257. Throughout the early twentieth century, jurists and legal theorists debated whether judges should look beyond a statute’s text and consider factors like legislative history. *Standard Oil Co. of N.J. v. United States* and *Holy Trinity Church v. United States* were two early bellwethers. 221 U.S. 1 (1911); 143 U.S. 457 (1892). By the 1940s, judges became more concerned with harmonizing statutory text and legislative purpose than with adhering to a law’s plain language—formalism gave way to purposivism. See William N. Eskridge, Jr. & Gary Peller, *The New Public Law Movement: Moderation as a Postmodern Cultural Form*, 89 MICH. L. REV. 707, 711–23 (1991) (discussing Hart and Sacks’ influence on the shift); see also William N. Eskridge, Jr., *The New Textualism*, 37 UCLA L. REV. 621, 628 (1990) (noting recent opposition from some judges to the Supreme Court’s habit, throughout most of the twentieth century, of looking beyond the statutory text for “strongly contradictory legislative history [that] can trump plain meaning”). However, in the past three decades, the textualist movement, led by Justice Scalia and Judge Easterbrook, has provided a strong countercurrent to purposivism. See generally Jonathan T. Molot, *The Rise and Fall of Textualism*, 106 COLUM. L. REV. 1, 30–36 (2006) (discussing the appeal of textualism and its impact).

258. Copyright Act of 1909 § 5(a), (d), (e).

259. Standards generally are favored in intellectual property law and provide judges with factors to guide the analysis of the law’s application. See, e.g., JESSICA LITMAN, *DIGITAL COPYRIGHT* 29 (2001) (“[C]opyright rules are complicated and hard to understand.”); Lee, *supra* note 139, at 1325–27 (discussing patent and copyright law’s reliance on standards); Merges, *supra* note 28, at 2190 (“Discrete, problem-specific legislation is in fact quite common.”). Standards would not mandate *per se* application to all future technologies. Cf. Kathleen M. Sullivan, *The Justices of Rules and Standards*, 106 HARV. L. REV. 22, 58–59 (1992) (explaining the difference between rules and standards).

260. Cf. Dodson, *supra* note 164, at 15–16 (“A rule is a norm that is enforced according to its terms rather than the policies animating it. A standard, by contrast, is the attempt to enforce those policies more directly.”).

like technologies alike, and different technologies differently. Finally, technology-specific standards would acknowledge institutional shortcomings by delegating to courts overtly, rather than indirectly through use-specific exceptions. Moreover, technology-specific standards would better respond to technology neutrality's stickiest problems by limiting the degree of forecasting that legislators must do when passing the law and by improving the law's targeting, thereby reducing both uniformity costs²⁶¹ and the penumbra of uncertainty.²⁶²

In dealing with a technology like Aereo, a court would be asked to first determine whether Aereo economically exploits a copyrighted work.²⁶³ Aereo's business model, the thrust of which is to commercialize, without license, over-the-air transmissions of copyrighted content, seems to be clearly within the meaning of economic exploitation.²⁶⁴ Next, a court would have to determine whether Aereo was substantively equivalent to a covered technology; if not, then proceed to the agency for compulsory license rate-setting.²⁶⁵ The result would likely be the same as that reached by the Supreme Court in June: Aereo is like a cable system, and therefore it is liable for infringing the broadcasters' copyrights.²⁶⁶ Yet, as we will see shortly, an approach that discriminates among technologies would provide a clearer answer on the issue of cloud computing.

2. The Role of an Agency

The agency role would be to clarify inconsistent application of copyright law to new technologies and to help adapt copyright law to new technologies by determining when new technologies deserve special treatment under existing law. The agency would do so by engaging in rulemakings to determine both the technologies that are of the kind that Congress sought to reach with copyright law and the technologies that might be, based on certain characteristics, but otherwise warrant favored

261. Michael W. Carroll, *One for All: The Problem of Uniformity Costs in Intellectual Property Law*, 55 AM. U. L. REV. 845, 890–91 (2006) (addressing the reduction of uniformity costs by use of standards versus rules).

262. See Sunstein, *supra* note 163, at 992–96 (emphasizing the confusion that can result from poorly written rules).

263. See 17 U.S.C. §§ 102(a), 106 (2012).

264. See Steel, *supra* note 43 (mentioning the decline of Aereo's business model after the Supreme Court "essentially shredded" it in June).

265. See, e.g., Landes & Posner, *supra* note 25 (listing some covered technologies).

266. *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 2498, 2511 (2014).

or disfavored treatment. The agency also would set compulsory license rates for those technologies that fell outside an authorship exclusive control right.

To be sure, an agency would end up spending time developing rules for soon-to-be-outmoded or commercially unrealized technologies, like digital audio tapes.²⁶⁷ But this concern is even sharper with Congress, which moves more slowly and at a higher cost.²⁶⁸ With courts, presumably more valuable technologies will be those that are litigated and gain market traction. Yet, courts are not singular, and common law rules develop over time; legal delay will often be even longer with courts than an agency.²⁶⁹

The agency would be best suited for addressing new technologies that fit into the known unknowns discussed in Part II.A. However, for paradigm-shifting technologies (i.e., the unknown unknowns), the agency's authority likely should be more circumscribed; the agency would determine whether it has jurisdiction over the new technology or whether that technology diverges too much from those technologies that Congress designed copyright law to reach. This, practically, would create a technological sunset for copyright law, forcing Congress to update the law in response to technologies that not only were unforeseen but also disrupt underlying principles.²⁷⁰

Returning to Aereo and the cloud, what role would the agency play? First, before the Aereo litigation ran its course, the agency could issue a rulemaking regarding whether Aereo and similar technologies are subject to the proposed Section 106(b). If the agency ruled that Aereo was substantively equivalent to a covered technology and did not warrant an exception, then Aereo would be subject to full copyright liability and would be required to negotiate with copyright owners to obtain a license.²⁷¹ If the agency ruled that Aereo is not a covered

267. See Liu, *supra* note 120, at 157–58 (discussing the rate of technological change and the need for policy to keep up).

268. See James J. Florio, *Congress As Reluctant Regulator: Hazardous Waste Policy in the 1980's*, 3 YALE J. ON REG. 351, 376 (1986) (“Congress acts only when driven by exogenous political forces to act.”).

269. See *id.* at 359 (“Normal bureaucratic delay and delay resulting from initiating a regulatory program are far different, however, from a conscious political decision by the executive branch to avoid the implementation of a law.”).

270. Cf. Ohm, *supra* note 62, at 1710–13 (explaining how technology-specific rules in surveillance law act as technology sunsets).

271. See also LANDES & POSNER, *supra* note 21, at 12 (“A property right is a legally enforceable power to exclude others from using a resource . . .”).

technology, then Aereo would be able to continue exploiting the broadcasters' copyrighted works without a negotiated license, but would be subject to the compulsory rate set for Aereo and similar technologies.²⁷² Neither rulemaking would affect cloud storage and transmission because of the explicit exemption added elsewhere in the statute.²⁷³ But what if cloud computing was developed after the statute's enactment, and thus no express exemption existed? In that case, the agency, based on congressionally defined principles of copyright and innovation policy, could create the exemption. Either way, the concerns for cloud computing, though prominent in the amici urging the Supreme Court to cabin any decision finding Aereo liable for copyright infringement under the current copyright system,²⁷⁴ are absent in this new framework.

B. THE CASE FOR DISCRIMINATION

Moving copyright law toward greater technological discrimination would not be cost-free. To begin, rulemaking and rate-setting would impose a heavier administrative burden than technology neutrality.²⁷⁵ Time and energy would, at times, be invested in crafting rules for new, but quickly obsolete, technologies.²⁷⁶ The earlier discussion regarding digital audio tapes is illustrative,²⁷⁷ and the unpredictable nature of innovation is informative.²⁷⁸ Some new technologies would garner more attention than their short technological lives deserve. Rate-setting also can be a contentious and laborious process, as demonstrated by the decade-plus process of calibrating a

272. See *supra* note 205 and accompanying text.

273. See *supra* note 248 and accompanying text.

274. See, e.g., Brief of 36 Intellectual Property and Copyright Law Professors as Amici Curiae Supporting Respondent, *Am. Broad. Cos. v. Aereo, Inc.*, 134 S. Ct. 1509 (2014) (No. 13-461), 2014 WL 1348474; Brief of Computer & Communications Industry Association and Mozilla Corporation as Amici Curiae Supporting Respondent, *Aereo*, 134 S. Ct. 1509 (No. 13-461), 2014 WL 1319386.

275. See generally Wendy E. Wagner, *Administrative Law, Filter Failure, and Information Capture*, 59 DUKE L.J. 1321, 1351 (2010) (introducing the administrative burden of processing information).

276. But see LESSIG, *supra* note 28, at 3 (“[T]he law adjusts to the technologies of the time. And as it adjusts, it changes.”).

277. See *supra* note 103 and accompanying text; cf. WILLIAM F. PATRY, PATRY ON FAIR USE, § 9:34, Westlaw (database updated May 2015) (discussing the history of semiconductor computer chip design bills and noting that only one reported case has been brought under the Semiconductor Chip Protection Act of 1984).

278. See *supra* notes 124–42.

webcasting royalty.²⁷⁹ Additionally, agencies are susceptible to regulatory capture by interested parties.²⁸⁰ In particular, “stakeholders with privileged access to information and to agency input channels” are able to shape substantive law to their benefit.²⁸¹ These challenges likely would be present in using an agency to adapt copyright law to new technologies.

Yet, copyright law long has been defined by legislative capture.²⁸² The negotiation process, by which authors and content industries have agreed to statutory revisions, favors a subset of stakeholders, namely authors and the content industries; users typically have not had the same seat at the table.²⁸³ Though regulatory capture is a real concern, it may be less problematic than the way copyright law long has been shaped. And, in fact, with the emergence of a technology lobby that often opposes the interests of the content lobby, delegating to an agency could be more efficient.²⁸⁴ An agency also could bring important expertise to the table.²⁸⁵ As Joseph Liu has argued, an agency at least

279. See Webcaster Settlement Act of 2009, Pub. L. No. 111-36, 123 Stat. 1926; Webcaster Settlement Act of 2008, Pub. L. No. 110-435, 122 Stat. 4974; Copyright Royalty and Distribution Reform Act of 2004, Pub. L. No. 108-419, 118 Stat. 2341; Small Webcaster Settlement Act of 2002, Pub. L. No. 107-321, 116 Stat. 2780; see also DiCola & Sag, *supra* note 32, at 224–38.

280. Wagner, *supra* note 275, at 1326 (“Administrative law, by contrast, imposes almost no filtering requirements or incentives on any of the participants who engage in the rulemaking and instead produces strong incentives for precisely the opposite behavior at key points in the process.”).

281. Margot E. Kaminski, *The Capture of International Intellectual Property Law Through the U.S. Trade Regime*, 87 S. CAL. L. REV. 977, 981 (2014); David Thaw, *Enlightened Regulatory Capture*, 89 WASH. L. REV. 329, 335 (2014) (“Classic views of regulatory capture consider the phenomenon to be normatively undesirable as disruptive of both democratic legitimacy and institutional accountability in the administrative state.” (footnotes omitted)).

282. See LESSIG, *supra* note 28, at 261 (“They adopt a rational strategy in an irrational context And that rational strategy thus becomes framed in terms of this ideal—the sanctity of an idea called ‘intellectual property.’”). See generally Litman, *supra* note 256, at 857–62 (discussing the legislative history of the 1976 Copyright Act).

283. See Litman, *supra* note 256, at 867 (stating which actors typically had a seat at the negotiating table).

284. See Peter S. Menell, *Envisioning Copyright Law’s Digital Future*, 46 N.Y.L. SCH. L. REV. 63, 195 (2002) (“Political economists characterize this ‘conflictual demand pattern’ for new legislation as conducive to an outcome in which Congress delegates resolution of the problem to a regulatory agency.” (footnotes omitted)).

285. See Thaw, *supra* note 281, at 370–74 (arguing that regulatory capture, when it provides a vehicle for private expertise, can actually advance the public interest).

would help “ensure that a wide range of stakeholders has real access to the policymakers.”²⁸⁶

Moreover, numerous advantages to technological discrimination outweigh these disadvantages. First, technological discrimination can improve copyright law’s tailoring and thereby reduce its over- and under-inclusiveness.²⁸⁷ Technology-neutral copyright imposes restrictions on new technologies when doing so is unnecessary for spurring creative expression; conversely, for costly works enabled by new technologies, neutrality might provide insufficient incentives. This is a consequence of copyright’s uniformity costs—those social costs resulting from, as Mike Carroll has explained, rights “that are more or less robust than necessary to have induced investments in innovation that deliver a net benefit to society.”²⁸⁸ Technology specificity, in contrast, facilitates greater tailoring of the law.²⁸⁹ A copyright owner’s control over a new technological market could be tethered to the potential effect of that new market on the copyright owner’s existing market and balanced against the social value of the new technology. In other words, the law could be calibrated to regulate a new technology in proportion to the technology’s cost to author control over economic exploitation. Moreover, agencies have investigative tools that courts lack, enabling agencies to look at issues beyond those presented by parties to litigation, and are authorized to engage in policymaking—“to weigh costs and benefits . . . and come to judgments about competing notions of what is likely to be good for society.”²⁹⁰

Second, and relatedly, an agency reduces legal uncertainty and delay both by streamlining the process of updating the law²⁹¹ and unifying rulemaking in a central body.²⁹² Congress,

286. Liu, *supra* note 120, at 158.

287. *Cf.* Chafee, *supra* note 79, at 517–19 (discussing the normative value of tailoring copyright law to industry- and use-specific economic considerations).

288. Carroll, *supra* note 261, at 849–50.

289. *Cf.* Lionel Bently, *Copyright and the Victorian Internet: Telegraphic Property Laws in Colonial Australia*, 38 *LOY. L.A. L. REV.* 71, 175 (2004) (discussing the value of technology specificity in response to issues raised by electric telegraphic dissemination of news in 1870s Australia).

290. Michael J. Burstein, *Rules for Patents*, 52 *WM. & MARY L. REV.* 1747, 1788 (2011).

291. Though Congress theoretically could update copyright law more often, practically frequent revisions are best accomplished by an administrative agency. *Cf.* Burk & Lemley, *supra* note 121, at 1635–36 (discussing the admin-

by empowering an agency, would avoid the pitfalls of locking the law in place for decades without deliberately tailoring it to technology that did not exist at the time the law was passed.²⁹³ The law would not be future-proofed in the sense that it need not be updated, but would adapt to the future via built-in mechanisms for flexibly responding to technological change,²⁹⁴ and more quickly than could occur through Congress.²⁹⁵

Third, discrimination avoids treating substantive technological differences, rather than just mechanical variations, the same. It helps the law focus on substantive equivalence and guards against mistaking equal application for equivalence. This is, after all, the “unprecedented power of technology neutrality”²⁹⁶—but its execution is severely hampered by the extreme technology neutrality of the 1976 Copyright Act. For example, a technology-specific law could recognize the substantive differences between cable and Aereo, between Aereo and cloud computing, and between cable and cloud computing. Recognizing when different technologies warrant different legal treatment avoids discriminating against new technologies in favor of old technologies and old business models. Conversely, granting copyright owners the same control over

istrative costs of Congress enacting patent statutes specific to numerous technological industries).

292. An agency’s interpretation of a rule would bind the courts and could resolve circuit splits. *See Moses, supra* note 67, at 278; Cass R. Sunstein, *Beyond Marbury: The Executive’s Power To Say What the Law Is*, 115 YALE L.J. 2580, 2588 (2006).

293. *See Pallante, supra* note 12, at 341 (arguing that the Copyright Office’s historical lack of much regulatory authority has led “Congress to write too much detail into the code on matters that are constantly changing, such as economic conditions and technology”).

294. There are many costs and benefits of an agency approach that are not related to technological change. *See* CORNELIUS M. KERWIN, *RULEMAKING: HOW GOVERNMENT AGENCIES WRITE LAW AND MAKE POLICY* 30–31 (3d ed. 2003) (engaging in a discussion about the source of agency power and how that influences its effectiveness).

295. *See Depoorter, supra* note 28, at 1865–67; Liu, *supra* note 120, at 156–57; Menell, *supra* note 284, at 195–97; *see also* Florio, *supra* note 268, at 381 (“[T]he staff and flexibility of an administrative agency are valuable in tailoring regulations to respond to individual situations.”).

296. Craig, *supra* note 185, at 299 (“The unprecedented power of technological neutrality to shape the contours of copyright protection therefore depends on an understanding of the principle that extends beyond simple non-discrimination in the application of copyright norms to new media. Rather, its power flows from a substantive commitment to the notion that copyright law should apply with equivalent *purpose and effect* across the technological landscape.”).

seen and unforeseen technologies is socially costly because, as Shyamkrishna Balganesh has argued, copyright owners “clearly are not best positioned to develop” new markets, and this can “facilitate a potential holdout, raising the transaction costs for developers of new media and devices and stifling innovation in the process.”²⁹⁷ It also helps curb efforts at legal avoision by instructing courts to analogize new technology to substantively equivalent covered technologies; the broadly defined, general exclusive right moreover helps curtail efforts to exploit a legal gap between distinct exclusive rights.

Finally, and maybe most significantly, employing technological discrimination could better promote innovation, by limiting copyright liability for some new technologies, while also protecting authors against depletion of the value of their copyrights.²⁹⁸ This proposal shifts copyright law’s defaults for uniquely unpredictable technologies to a compulsory license regime, moving away from the current default of copyright liability but without swinging all the way to the *White-Smith Music* model of free use.²⁹⁹ Coupled with increased tailoring, technological discrimination would help copyright law provide incentives for authors *and* facilitate innovation as a default, without relying so heavily on ad hoc fair use determinations.

297. Balganesh, *supra* note 46, at 1590–91.

298. *Cf.* Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 442 (1984) (opining that the law “must strike a balance between a copyright holder’s legitimate demand for effective—not merely symbolic—protection of the statutory monopoly, and the rights of others freely to engage in substantially unrelated areas of commerce”); SUPPLEMENTARY REPORT, *supra* note 82, 13–14 (“A real danger to be guarded against is that of confining the scope of an author’s rights on the basis of the present technology so that, as the years go by, his copyright loses much of its value because of unforeseen technical advances. For these reasons, we believe that the author’s rights should be stated in the statute in broad terms”); Lemley & Reese, *supra* note 48, at 1350 (“Optimal digital copyright policy with respect to p2p networks would do two things: deter technological innovators as little as possible and permit cost-effective enforcement of copyright in the digital environment.”).

299. *White-Smith Music Publ’g Co. v. Apollo Co.*, 209 U.S. 1, 17–18 (1908); *cf.* NEIL WEINSTOCK NETANEL, COPYRIGHT’S PARADOX 151 (2008) (“As crafted by Congress or the courts, the compulsory licenses aim to maintain copyright law’s economic incentives to create and disseminate new expression. But . . . by freeing new technological distributors from incumbents’ vertical restraints, the compulsory licenses have created alternative outlets for independent speakers and helped to foster expressive diversity.”).

CONCLUSION: BEYOND COPYRIGHT

As Congress continues reviewing copyright law for possibly its fifth major overhaul, it should look beyond the functioning of individual provisions—e.g., Are statutory damages as set by Section 504 too variable and at times disproportionate? Are the music statutory licenses working for copyright owners and users?—to the “unifying theme”³⁰⁰ of the 1976 Act: that the default provisions dictate applying the law to new technologies just as it was applied to old technologies. The past four decades have demonstrated that technology neutrality is no panacea for the typical ailments of statutory aging. If Congress wants to promote the longevity of “The Next Great Copyright Act,” it should rethink the fundamental language of the exclusive rights, copyrightable subject matter, and statutory definitions. And it should give clearer roles for other institutions to help tailor copyright law to new technologies.

Moreover, Congress should not confine this rethinking to the Copyright Act. Though this Article has used copyright law as an analytic lens for recasting technology neutrality, technology neutrality infuses legal regimes as varied as those of governing surveillance,³⁰¹ telecommunications,³⁰² patents,³⁰³ and electronic signatures.³⁰⁴ Because the problems discussed are inherent to technology neutrality, and not the result of its implementation in copyright, they appear in other technology-neutral laws, though in varying degrees. It is, thus, worth considering the implications of this conceptual rethinking beyond copyright. This Article concludes with a brief discussion of patent law.

Like copyright, patent law is by default technology neutral.³⁰⁵ Patentability and infringement generally are determined based on broadly applicable legal rules and standards,

300. NIMMER & NIMMER, *supra* note 79, § 12A.16[B].

301. *See, e.g.*, Pen Registers and Trap and Trace Devices Act, 18 U.S.C. §§ 3121–3127 (2012).

302. *See* Reed, *supra* note 62, at 264 (“[T]echnology neutrality has continued to be a pervasive concept in that field, influencing among others the debates on convergence with broadcasting, voice over IP, universal service, spectrum allocation and net neutrality.” (footnotes omitted)).

303. *See* 35 U.S.C. §§ 100–212 (2012).

304. *See* Electronic Signatures in Global and National Commerce Act (ESIGN), 15 U.S.C. §§ 7001–7021 (2012).

305. *But see* Burk & Lemley, *supra* note 121, at 1577 (questioning whether patent law is technology-neutral in its application).

with the statute rarely technology specific.³⁰⁶ Yet, though patent law's provisions "are designed to adapt flexibly to new technologies, encompassing 'anything under the sun made by man,'"³⁰⁷ courts and the U.S. Patent and Trademark Office (PTO) have been engaged in a decades-long process of making patent law technology-specific.³⁰⁸ The PTO, for example, has technology-specific obviousness guidelines for patent examiners.³⁰⁹ This process has occurred largely haphazardly, resulting in poor tailoring and incidental technology specificity.³¹⁰

However, Dan Burk and Mark Lemley proffer that it is best to keep patent law technology neutral—"that we should not jettison our nominally uniform patent system in favor of specific statutes that protect particular industries"³¹¹—because courts can employ policy levers to better tailor patent law whereas industry-specific legislation would be susceptible to "rent-seeking" and obsolescence.³¹² It could be that courts alone are best suited to tailoring patent law. But it does not follow that technology neutrality is automatically better than specificity simply because Congress is an inefficient vehicle for adapting patent law to new technologies or technological classes.

Technology neutrality's limitations in patent can be seen in the battle over business method³¹³ and software patents.³¹⁴ Patent law, like copyright, is about providing incentives, with the theoretical justification even more utilitarian.³¹⁵ And it is possi-

306. See *supra* note 259.

307. Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific*, 17 *BERKELEY TECH. L.J.* 1155, 1156 (2002) (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980)).

308. See generally Burk & Lemley, *supra* note 121, at 1630–38 (exploring the development of industry-specific patent laws).

309. See *Examination Guidelines & Training Materials in view of KSR International Co. v. Teleflex Inc.*, U.S. PATENT & TRADEMARK OFF., <http://www.uspto.gov/patent/laws-and-regulations/examination-policy/examination-guidelines-training-materials-view-ksr> (last visited Mar. 17, 2016).

310. See Burk & Lemley, *supra* note 121, at 1595.

311. *Id.* at 1579.

312. *Id.* at 1634–37.

313. See, e.g., *Bilski v. Kappos*, 561 U.S. 593 (2010). For further discussion of the "post-*Bilski*" confusion, see generally Mark A. Lemley et al., *Life After Bilski*, 63 *STAN. L. REV.* 1315 (2011).

314. See, e.g., *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014); see also Robert P. Merges, *Software and Patent Scope: A Report from the Middle Innings*, 85 *TEX. L. REV.* 1627 (2007); Adam Mossoff, *A Brief History of Software Patents (and Why They're Valid)*, 56 *ARIZ. L. REV. SYLLABUS* 65 (2014).

315. See *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 511 (1917) ("[T]he primary purpose of our patent laws is not the creation

ble that patent law's broad, technology-neutral rules, by allowing certain technological classes into the patent system or granting different technologies the same rights, are actually discouraging innovation more than they are incentivizing it.³¹⁶ If that is the case—and many scholars (myself included) argue that it has been with software patents³¹⁷—then it would seem that technology-specific defaults would augment patent tailoring.

When legal regimes adopt technology neutrality as a general principle, it leads to rules that are over-inclusive and speak poorly to unforeseen technologies. This makes technology neutrality socially undesirable. It also, in turn, results in inconsistent treatment of similar technologies and increases uncertainty about whether and how the law will be or should be applied. And that undermines neutrality's goals of promoting statutory longevity and adapting the law to new technologies. Copyright law offers a powerful illustration, but it is only one of many technology-neutral laws that fall short of policy goals. And it is likely that many other areas of the law could benefit from technological discrimination.

of private fortunes for the owners of patents but is "to promote the progress of science and useful arts."); see also Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1024–28 (1989) (discussing the utilitarian theory of patent law).

316. See Lisa Larrimore Ouellette, *Patent Experimentalism*, 101 VA. L. REV. 65, 113–18 (2015).

317. See Brief of Law, Business, & Economics Scholars as Amici Curiae Supporting Respondents at 8–10, *Alice Corp.*, 134 S. Ct. 2347 (No. 13-298), 2014 WL 880952, at *8–10; see also James Bessen, *A Generation of Software Patents*, 18 B.U. J. SCI. & TECH. L. 241, 255 (2012) (asking whether software firms now get more patents); Brian J. Love, *No: Software Patents Don't Spur Innovation, but Impede It*, WALL ST. J., May 12, 2013, at R2. But see David J. Kappos, *Investing in America's Future Through Innovation: How the Debate over the Smart Phone Patent Wars (Re)Raises Issues at the Foundation of Long-Term Incentive Systems*, 16 STAN. TECH. L. REV. 485, 488–90 (2013) (claiming that many of the patents thought of as software patents—e.g., those involved in the smartphone lawsuits—are valid and are not software patents).