Law and New Technology: The Virtues of Muddling Through

The Digital Dilemma: Intellectual Property in the Information Age. By the Committee on Intellectual Property Rights and the Emerging Information Infrastructure, Computer Sciences and Telecommunications Board, Commission on Physical Sciences, Mathematics, and Applications, National Research Council. Washington, D.C.: National Academy Press, 2000. Pp. 340.

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In 1986, before the Internet became a household word, the federal Office of Technology Assessment warned that "new information and communications technologies available today are challenging the intellectual property system in ways that may only be resolvable with substantial changes in the system or with new mechanisms to allocate both rights and rewards."[1] The nascent technologies at issue then seem prosaic today: videocassette recorders, two-way interactive cable, fiber optic communications, and satellite television.

Though the Office of Technology Assessment's 1986 report did not address intellectual property issues relating to the Internet,[2] the underlying concern that gave rise to its report remains as real today as it did then: "Once a relatively slow and ponderous process, technological change is now outpacing the legal structure that governs the system, and is creating pressures on Congress to adjust the law to accommodate these changes."[3] Today, as before, there are calls for changes in our system of intellectual property rights, and pressure for lawmakers to "do something."[4] Napster's digital music file-

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1. OFFICE OF TECHNOLOGY ASSESSMENT, INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION 3 (1986) (hereinafter OTA REPORT).

2. *See id.* at 68-69, 111, 139-42. In the late 1960s and 1970s, the Defense Department's Advanced Research Projects Agency led an effort to connect computers at research laboratories across the country to allow academic and government scientists and others to share computer resources. *See generally* KATIE HAFNER & MATTHEW LYON, WHERE WIZARDS STAY UP LATE: THE ORIGINS OF THE INTERNET (1996). That effort, which led to ARPANET and eventually to the Internet, was well along by the time of the Office of Technology Assessment's 1986 report, but it appears that intellectual property issues raised by the distribution of content over the Internet were just beginning to be recognized.

3. OTA REPORT, *supra* note 1, at 3.

4. *See, e.g.*, John Markoff, *The Concept of Copyright Fights for Internet Survival*, N.Y. TIMES, May 10, 2000, at A1; Editorial, *The Remedy for Microsoft*, N.Y. TIMES, Apr. 28, 2000, at A22 ("Can,

sharing system is but the most recent high-profile example of the way in which contemporary technological developments have challenged traditional legal principles.[5] But the question of *how* the law should adapt or change in response to new technology is a difficult and pressing one: As the Office of Technology Assessment report observed, "because the new information and communication technologies do not fit neatly within the existing framework of the law, the balance [between public and private interests] may be harder to achieve in the future."[6]

Indeed, fundamental legal questions arising from the explosive growth of the Internet are just now beginning to be addressed. Should electronic signatures and records have the same legal status as wet-ink signatures and paper records?[7] Where should there be jurisdiction to hear and to resolve disputes arising from information transmitted or transactions conducted over the Internet?[8] Are Internet service providers publishers of the content they carry, or are they mere common carriers akin to public utilities?[9] What role should govern-

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and should, laws designed...in the late 19th and early 20th centuries be applied to the technology and intellectual property of the 21st Century?").

5. *See* A&M Records, Inc. v. Napster, Inc., 293 F.3d 1004 (9th Cir. 2001) (holding Napster contributorily liable for copyright infringement to the extent it has knowledge of specific infringing files, knows or should know that such files are available on its system, and fails to prevent viral distribution of the works); Testimony of Hank Berry, Chief Executive Officer, Napster, Inc., before the Senate Judiciary Comm. (July 11, 2000), *available at* http://www.senate.gov/~judiciary/7112000_hb.htm.

6. OTA REPORT, *supra* note 1, at 14. In 1995, the Clinton Administration's Information Infrastructure Task Force's Working Group on Intellectual Property Rights echoed this theme: "Changes in technology generate new industries and new methods for reproduction and dissemination of works of authorship, which may present new opportunities for authors, but also create additional challenges. Copyright law has had to respond to these challenges, from Gutenberg's moveable type printing press to digital audio recorders and everything in between." WORKING GROUP ON INTELLECTUAL PROPERTY, INFORMATION INFRASTRUCTURE TASK FORCE, INTELLECTUAL PROPERTY AND THE NATIONAL INFORMATION INFRASTRUCTURE 7 (Sept. 1995), *available at* http://www.uspto.gov (hereinafter IITF REPORT). That Working Group also concluded that "[w]e are once again faced with significant changes in technology that upset the balance that currently exists under the Copyright Act. Our goal is to maintain the existing balance." *Id.* at 14.

7. *See, e.g.*, Electronic Signatures in Global and National Commerce Act, 15 U.S.C. § 7001 (2000).

8. *See, e.g.*, Cybersell, Inc. v. Cybersell, Inc., 130 F.3d 414 (9th Cir. 1997) (holding that defendant's mere presence on the World Wide Web was insufficient to confer jurisdiction under the minimum contacts standard); Zippo Manufacturing Co. v. Zippo Dot Com, 952 F. Supp. 1119, 1124 (W.D. Pa. 1997) (concluding that jurisdiction over a defendant based solely on its operation of a website depended on "the level of interactivity and commercial nature of the exchange of information that occurs on the Web site").

9. *See, e.g.*, Zeran v. America Online, Inc., 129 F.3d 327 (4th Cir. 1997) (holding, under the Communications Decency Act of 1996, Internet service provider not liable for defamatory statement); Compuserve, Inc. v. Cyber Promotions, Inc., 962 F. Supp. 1015, 1024 (S.D. Ohio 1997) (holding that defendant had not demonstrated that Internet service provider qualified as a public utility under Ohio law). Congress has responded to this debate by establishing "safe harbors" under certain circumstances for Internet service providers. *See, e.g.*, The Communications Decency Act of 1996, 47 U.S.C. § 230(c)(1) ("[n]o provider. . .of an interactive computer service shall be treated as the publisher or speaker of any information provided by another information content provider"); The Digital Millennium Copyright Act of 1998, tit. II, Pub. L. No. 105-304, 112 Stat. 2860 (codified in scattered sections of 17 U.S.C.) (providing immunity from monetary damages arising from copyright infringement for "online service providers" that qualify under certain safe harbors). *But cf.* Union des Etudiants Juifs

ments play in protecting privacy and personal information that may be collected and shared with ease over the Internet?[10] And how can governments regulate criminal activity – such as fraud, child pornography, terrorist acts, and illegal drug trafficking – that may be conducted through the use of modern computer tools and the Internet?[11]

The Internet and new information technologies likewise challenge traditional notions of intellectual property law. For instance, to what extent are works available on the Internet protected by copyright law, and what constitutes "fair use" of such works?[12] What should the relationships, if any, be among trademarks, domain names, metatags, and unfair competition law?[13] Additionally, should certain business methods, such as those involving the use of the Internet, be patentable?[14]

These sorts of questions, together with the emerging view that "many of the intellectual property rules and practices that evolved in the world of physical artifacts do not work well in the digital environment,"[15] inspired *The Digi-*

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de France and Ligue Contre la Racisme et L'Antisemitisme v. Yahoo! Inc. and Yahoo! France, T.G.I. Paris, Ordonnance de refere du 20 novembre 2000, *at* http://www.juriscom.net/txt/jurisfr/cti/tgiparis20001120.pdf (holding by French court ordering Yahoo!'s English-language U.S. site to comply with a French law prohibiting the display or sale of objects that incite racial hatred and in particular to block French users' access to Nazi-era memorabilia offered on the site) (English translations of the decision available at http://www.gigalaw.com/library/france-yahoo-2000-11-20.html). For further discussion of the French Yahoo! case, see, e.g., Kurt A. Wimmer, *E-Litigation: Internet Jurisdiction*, NAT'L L.J., Mar. 26, 2001, at A12.

10. *See, e.g.*, FEDERAL TRADE COMMISSION, PRIVACY ONLINE: FAIR INFORMATION PRACTICES IN THE ELECTRONIC MARKETPLACE (2000); Gramm-Leach Bliley Financial Services Modernization Act of 1999, tit. V, §§ 501 *et seq.*, Pub. L. 106-102 (1999); Children's Online Privacy Protection Act of 1998, 15 U.S.C. §§ 6501-6505; Council Directive 95/46 of the European Parliament and of the Council on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data, 1995 O.J. (L281).

11. *See, e.g.*, U.S. DEPARTMENT OF JUSTICE, THE ELECTRONIC FRONTIER: THE CHALLENGE OF UNLAWFUL CONDUCT INVOLVING THE USE OF THE INTERNET (2000), *available at* http://www.cybercrime.gov (hereinafter THE ELECTRONIC FRONTIER); Neal Kumar Katyal, *Criminal Law in Cyberspace*, 142 U. PA. L. REV. __ (April 2001).

12. *See, e.g.*, A&M Records, Inc. v. Napster, Inc., 293 F.3d 1004 (9th Cir. 2001) (affirming in relevant part district court's preliminary injunction against Napster as a contributory and vicarious copyright infringer as a result of its music file-sharing system); *see also* Tasini v. New York Times Co., 972 F. Supp. 804 (S.D.N.Y. 1997), *cert. granted*, 121 S.Ct. 425 (2000) (raising issue of how to characterize electronic "copies" of copyrighted works); The Digital Millennium Copyright Act of 1998, *supra* note 9 (prohibiting the circumvention of copyright protection systems and the manufacture, import, sale, or distribution of devices or services used for such circumvention).

13. *See, e.g.*, Brookfield Communications, Inc. v. West Coast Entm't Corp., 174 F.3d 1036 (9th Cir. 1999); The Anticybersquatting Consumer Protection Act, 15 U.S.C. §§ 1051, 1125 (2001).

14. *See, e.g.*, State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368 (Fed. Cir. 1998) (holding data processing system to be patentable subject matter), *cert. denied*, 525 U.S. 1093 (1999); Amazon.com, Inc. v. Barnesandnoble.com, Inc., 73 F. Supp.2d 1228 (W.D. Wash. 1999) (enjoining Barnesandnoble.com from using Amazon.com's patented one-click electronic shopping technology), *rev'd*, 239 F.3d 1343 (Fed. Cir. 2001). For an example of commentary in the public press, see James Gleick, *Patently Absurd*, N.Y. TIMES MAGAZINE, Mar. 12, 2000 ("the patent system is in crisis. A series of unplanned mutations have transformed patents into a positive threat to the digital economy").

15. THE DIGITAL DILEMMA: INTELLECTUAL PROPERTY IN THE INFORMATION AGE at ix (Comm. on Intellectual Property Rights and the Emerging Information Infrastructure, Computer Sciences and Telecommunications Board, Commission on Physical Sciences, Mathematics and Applications, National

tal Dilemma. Authored by a committee established by the Computer Science and Telecommunications Board of the National Research Council, *The Digital Dilemma* combines legal, policy, economic, and technical analyses to identify issues and to make recommendations relating to the impact of new information technology and digital information on our intellectual property system.

This Review first focuses on *The Digital Dilemma*'s policy analysis and recommendations, paying particular attention to the authors' conclusions that relate to how the law should adapt to changes presented by the Internet and new information technologies. The second part of this Review attempts to put these recommendations in a broader context by sketching other instances in which the law (at least in the United States) has had to respond to changes in technology. That context suggests that the recommendations made in *The Digital Dilemma* can be viewed as consistent with a more general, historical model in which the law and legal institutions typically react slowly and incrementally in response to new technology.

I. INTELLECTUAL PROPERTY LAW MEETS THE INTERNET

The authors of *The Digital Dilemma* faced a daunting task. Formed in 1997, the National Research Council's Committee on Intellectual Property Rights and the Emerging Information Infrastructure was designed to represent a "microcosm of the diverse community of interest" drawn from industry, academia, and the library and information science community.[16] Its mandate was an ambitious one: "to assess issues and derive research topics and policy recommendations related to the nature, evolution, and use of the Internet and other networks, and to the generation, distribution, and protection of content accessed through networks."[17] In pursuing its broad mission, the Committee had to cope with the rapid pace of technological and other changes associated with the Internet (including changes in the law and in relevant business models), which meant that findings and conclusions proffered one day might well be outdated the next. Overcoming this triple-whammy of circumstances – drafting by committee while striving to deal comprehensively with a moving target – was no small feat.

Rising to the challenge, the authors of *The Digital Dilemma* have done a

Research Council ed., 2000) (hereinafter THE DIGITAL DILEMMA). The National Research Council is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. It is administered jointly by both Academies and the Institute of Medicine.

16. *Id.* at xi; *see also id.* at 27 ("the members of the study committee were selected to provide the diverse expertise needed to ensure that stakeholders' wide-ranging perspectives were represented").

17. *Id.* at x; *see also id.* at xi, Box P.1 (outlining the Committee's Statement of Task). Elsewhere, the book states that its purpose is "to explain and demystify the underlying technology trends, explore the range of technological and business tools that may be useful, and recommend a variety of actions that can be taken to help ensure that the benefits of the information infrastructure are realized for rights holders and society as a whole." *Id.* at 27.

commendable job of covering the many intellectual property issues raised by the Internet and other network technologies. The book begins with an overview of the basic issues presented by emerging digital and network technologies, noting, for example, that, unlike access to traditional media (reading a book, watching a movie, or listening to a CD), access to digital works inevitably requires the making of a copy, and that, unlike copying traditional works, copying digital works is easy, inexpensive, and produces perfect copies. Add to that the fact that computer networks now make global distribution of that information inexpensive and nearly instantaneous, and one can easily see how existing copyright law, which might have prohibited (or at least tolerated) the individual copying contemplated in the analog world of traditional media, might be ill-suited to deal with the sort of mass copying rendered simple and commonplace on the Internet.

Further complicating these issues, as the book's authors point out, are the wide-ranging and often conflicting interests of multiple stakeholders, which range from intellectual property creators to intellectual property distributors, schools and libraries, the general public, and other consumers and producers of intellectual property (governmental organizations, private sector organizations, journalists, and standards organizations).[18] Recognizing and reconciling these diverse interests – and the need to view the issues through the lenses of technology, law, economics, psychology and sociology, and public policy – are important first steps in the balancing exercise that is at the heart of the current digital policy debate, and *The Digital Dilemma*'s compendium of stakeholder concerns and multiplicity of perspectives are noteworthy contributions to that debate.

A. An Example of the Digital Dilemma: The Challenge of Digital Music

Intellectual property issues arising from online content, of course, do not arise in a vacuum or in the abstract, and the authors of *The Digital Dilemma* use the modern-day "maelstrom" over digital music as a springboard to analyze many of the issues presented.[19] Legal and policy controversies surrounding digital music place in sharp relief the issues that arise with regard to digital intellectual property generally, such as the need to distribute digital information while retaining control over it, the important struggle over standards and formats, and the rise and fall of different business models that fluctuate in response to how the new technology changes the previous balance of power. For these reasons, the authors view digital music as intellectual property's canary in the coal mine; the problem is, what is this canary telling us? As the authors not so helpfully note, "[s]omething is about to happen, but will it be a disaster

18. *See id.* at 61-75.
19. *See id.* at 76.

or an opportunity?" But the historical perspective they offer suggests some basis for optimism:

> New technology and new business models for delivering content are almost always greeted with the belief that they will destroy the existing market. In 17th century England, the emergence of lending libraries was seen as the death knell of book stores; in the 20th century, photocopying was seen as the end of the publishing business, and videotape the end of the movie business. Yet in each case, the new development produced a new market far larger than the impact it had on the existing market. Lending libraries gave inexpensive access to books that were too expensive to purchase, thereby helping to make literacy widespread and vastly increasing the sale of books. Similarly, the ability to photocopy makes the printed material in a library more valuable to consumers, while videotapes have significantly increased viewing of movies.[20]

Unfortunately, the authors hazard no guesses as to the outcome for digital music, though the central insight about innovation leading to an increase in the market, rather than a decrease, is surely worth bearing in mind, particularly by those most immediately threatened by the new technology.

Still, the question remains: What can be done about the widespread copying and distribution of copyrighted works? Here, the authors offer a perceptive primer on different business models and technical protection mechanisms that can be used to minimize digital piracy. In the realm of business models, for example, the book identifies three potentially promising efforts: making digital content easier and cheaper to buy than to steal (because "[t]he key product is not only the song; it is also the speed, reliability, and convenience of access to it"[21]); using digital content to promote the traditional product (giving away free songs to sell the album or CD); and giving away digital content and focusing on auxiliary markets (giving away content to sell concert attendance and related merchandise). In the area of technical protection methods, the authors focus on digital watermarking technologies (to help identify the copyright owner and trace the source of redistribution) and specialized hardware schemes that prevent unauthorized copying. The authors acknowledge the many difficulties associated with these forms of technical protection mechanisms, not the least of which is that they can be and are routinely defeated. Whether these new business models and technological responses to digital music are harbingers of a "radical shift in power"[22] remains to be seen, but there is little doubt that

20. *Id.* at 78-79 (citations omitted).
21. *Id.* at 81.
22. *Id.* at 90.

struggles over protecting intellectual property are likely to continue to be intense in the years to come.

B. Explaining the Digital Dilemma

The central chapters of *The Digital Dilemma* set forth the core of the authors' analysis: the importance of copyright in ensuring public access to creative works; the challenges to public access presented by digital information; the need to re-define or to adapt concepts of private use and fair use in the context of digital information; and the roles of technical protection mechanisms and business models as ways to protect digital information. The authors present many sound suggestions, supported by detailed analyses. For example, they recommend development of a copyright education program[23] and further research on the economic impacts of copyright and illegal commercial copying.[24] Other recommendations tend to be straightforward in concept, but potentially complex in practice. On the issue of public access, for example, the authors recommend that stakeholder representatives "convene to begin a discussion of models for public access to information that are mutually workable in the context of the widespread use of licensing and technical protection services."[25] This is no doubt a good idea, but precisely how the relevant parties will come together and reach agreement is a practical question that is not easily resolved.

Other conclusions and recommendations provided in the book are more provocative. The authors suggest re-defining, to account for changes arising from our new digital environment, the concepts of "publication,"[26] "fair use,"[27] "author,"[28] and even "copy."[29] The emergence of digital information and new communications technologies no doubt tests the definitional architecture of intellectual property law, but it is not clear that it does so in ways fundamentally different from the way any new technology challenges prevailing legal definitions and concepts. As discussed below in Part II of this Review, there have been many instances in which new technologies have re-defined fundamental legal concepts. The larger, and largely unanswered, question is whether the sort of theoretical or academic research proposed by the authors can appreciably accelerate the *process* by which the law responds to changes in technology.

In the few areas where the book's authors could not reach consensus on particular recommendations, they offer a range of divergent views. For exam-

23. *See id.* at 16-17, 216-17, app. F at 304-10.
24. *See id.* at 17-18, 227-30, app. D at 271-81.
25. *Id.* at 9, 205.
26. *Id.* at 8.
27. *Id.* at 11-12.
28. *Id.* at 232-33.
29. *Id.* at 230-32.

ple, the authors could not agree on the extent to which mass market license terms (e.g., those for software) can or should override certain copyright law doctrines (most notably the fair use doctrine).[30] The authors also failed to reach consensus on the extent to which the Digital Millennium Copyright Act should be interpreted or revised to permit a broader range of "legitimate" circumvention activities.[31] The authors correctly note that these are difficult and controversial issues, and some readers will no doubt find the lack of a position taken on them frustrating, but by the same token, the candor with which the authors weigh each side and ultimately throw up their hands seems refreshing.[32]

Beyond its specific recommendations, several aspects of *The Digital Dilemma* are particularly noteworthy. First, perhaps reflecting the balanced composition of the drafting committee,[33] the authors navigate a course that avoids both an alarmist, sky-is-falling view (the Internet threatens to undermine and hence will destroy our entire intellectual property system) and, at the other extreme, a simplistic, Pollyannish view (information "just wants to be free," and technology will eventually cure any problems). Instead, the book adopts a more reasoned, thoughtful, and nuanced analysis. Without demonizing the Internet or hyping its benefits, the authors put forth a convincing view that new information technologies pose profoundly difficult challenges to our intellectual property system and threaten to disrupt the careful balances embedded in that system. By recognizing both the promises and the perils presented by new information technologies, the authors resist the simplistic urge, sometimes seen in current policy debates, to present new technologies in purely black-or-white terms. Like most other new technologies, the Internet and new information technologies are powerful but essentially value-neutral tools that can be used in ways that are socially beneficial or socially harmful. By identifying relevant issues, examining stakeholder interests, and venturing recommendations in a rapidly changing environment, *The Digital Dilemma* fills an important gap in helping policymakers make well-informed and intelligent choices as they confront new information technology.

A second noteworthy strength of the book derives from the fact that the authors practice what they preach about the need to analyze the relevant issues from a variety of perspectives, including technology, law, economics, business, and policy. This analytical method avoids the tunnel vision that can accompany

30. *See id.* at 206.

31. *See id.* at 222-23.

32. *Cf. id.* at 145 n.40 (describing as "extremely intense" the Committee's deliberations on whether "copying" is an appropriate benchmark concept in copyright law).

33. *See id.* at xi; *see also id.* at 27 ("the members of the study committee were selected to provide the diverse expertise needed to ensure that stakeholders' wide-ranging perspectives were represented"). Biographical information about the members of the study committee appears in Appendix A of the book. *See id.* at 253-60.

single-discipline approaches and produces a richer, more interesting, and ultimately more complete perspective. To support their analysis, the authors have provided separate boxes of text or figures that accompany, at appropriate points, the main body of the report, as well as several detailed, substantive appendices. The appendices offer clear and in-depth explanations of topics as diverse as how the Internet works, information economics, technologies for intellectual property protection, and the Digital Millennium Copyright Act of 1998. The appendices are written so as to serve not only as practical introductions for neophytes to the relevant subjects, but also as convenient refresher courses for more technically sophisticated readers.

Although a few of the book's recommendations are specific and concrete, such as the proposal that Congress enact legislation to permit copying of digital information for archival purposes,[34] a third noteworthy feature lies in the fact that, by and large, the book's recommendations focus on the need to re-assess core concepts and on suggested directions for future research.[35] To the extent the authors recommend substantive changes, they adopt an evolutionary, or incrementalist, approach.[36] For example, on a centrally important issue – the legal status of private, non-commercial copying – the authors conclude that "[p]roviding additional statutory limitations on copyright and/or additional statutory protection may be necessary over time to adapt copyright appropriately to the digital environment," but that "[t]he fair use doctrine may also prove useful as a flexible mechanism for adapting copyright to the digital environment."[37]

C. Assessing the Digital Dilemma: A Missed Opportunity?

If there is an unfortunate shortcoming to *The Digital Dilemma*, it is more one of form than substance. The issues presented are complex and interwoven, and the book's conclusions are directed to multiple audiences. But if the promise of the book was at least in large part to "offer[] a framework for the evaluation and construction of public policy, as well as a variety of specific conclusions and recommendations designed to help legislators, courts, administrators, and the public to understand what is at issue, to formulate questions

34. *See id.* at 10, 210.

35. *See, e.g., id.* at 225-30 (describing recommendations for further research on illegal commercial copying, the economics of copyright, use of patents, and intellectual property law).

36. That approach is also consistent with the conclusion of the 1995 Information Infrastructure Task Force's Working Group on Intellectual Property, which found that "[w]ith no more than minor clarification and limited amendment, the Copyright Act will provide the necessary balance of protection of rights—and limitations on those rights—to promote the progress of science and the useful arts. Existing copyright law needs only the fine tuning that technological advances necessitate, in order to maintain the balance of the law in the face of onrushing technology." IITF REPORT, *supra* note 6, at 17 (footnote omitted).

37. THE DIGITAL DILEMMA, *supra* note 15, at 12, 215.

clearly, and to assess alternatives,"[38] then its most important recommendations should have been distilled in easily digestible form for the report's intended audience – legislators, judges, and policymakers, in particular. This need is more important than ever, given the proliferation of information and ideas (aided in part by the Internet) and the limited attention key decisionmakers can give to any but the highest profile issues.

For example, *The Digital Dilemma*'s authors underscore, among other policy recommendations, the need for a technology-neutral approach, for consideration of all relevant forces in the digital environment, and for simplicity and comprehensibility in new or revised intellectual property laws, but these important recommendations do not appear until late in both the book's text and executive summary.[39] The book's "Principles for the Formulation of Law and Public Policy"[40] appear somewhat as an afterthought and are presented without extensive discussion or elaboration. A road map of the book – at page 60 – also comes too late. Paradoxically, the book's executive summary, while adequate, is both over-inclusive and under-inclusive. It is over-inclusive because, at twenty-two pages, it is too lengthy to qualify as a true executive summary (*i.e.*, one that sets forth, in a crisp and coherent way, the report's major findings and recommendations). It is under-inclusive because, despite its length, it presents the authors' conclusions and recommendations seriatim, without assigning any sense of relative importance or priority to them, and without capturing the richness and range of topics covered in the book. For instance, the executive summary hardly mentions the book's extensive discussion of the myriad of issues raised by digital music.[41]

A couple of other nits: The brief discussion of the law enforcement challenges posed by the Internet accurately catalogs the sorts of obvious challenges presented – difficulty in establishing identity, blurring cues about social contexts, and permitting action at a distance[42] – but omits a fuller discussion of the issues. A fuller discussion of Internet and intellectual property law enforcement challenges might include the ways in which current laws already apply to unlawful conduct involving the use of the Internet and the ways in which law enforcement officials can use the Internet to conduct investigations from a distance and to investigate the identity of unsophisticated users.[43] Similarly, the book's discussion of technical protection mechanisms appropriately focuses on their technical aspects,[44] but concludes in part with a question-begging state-

38. *Id.* at 10, 210.

39. *See id.* at 20-22, 233-35.

40. *Id.* at 236-38, Box 6.2.

41. *See id.* at ch. 2.

42. *See id.* at 49.

43. *See, e.g.*, THE ELECTRONIC FRONTIER, *supra* note 11, at 17-23; *see also id.* at app. I (discussing software piracy and intellectual property theft).

44. *See* THE DIGITAL DILEMMA, *supra* note 15, at 153-76, app. E at 282-303.

ment that "[t]echnical protection mechanisms are useful but are not a panacea."[45] Readers interested in a more sophisticated assessment of technical protection mechanisms will have to wade through much of chapter five of the book and may still come away unsatisfied.[46]

One final quibble: The book's title – *The Digital Dilemma* – is a bit of a misnomer, for in the context of intellectual property and digital technology, the fundamental policy question is not a *choice* between two equally desirable (or undesirable), mutually exclusive alternatives. That is, the question does not require a choice between only two alternatives: rewarding intellectual property creators and owners for their work on the one hand, or, on the other, ensuring free access to and the sharing of the information so created. Rather, the fundamental policy question is *how much* of a reward, and *how much* protection should be granted; the instrumentalist goal is to ensure *both* that authors and publishers are rewarded and given incentives to create and disseminate future works *and* that the public benefits of information access and sharing (including that which stimulates future creations) may be realized. This is not the sort of policy dilemma in which one alternative must be chosen over another; instead, the alternatives are mutually supportive means between which a balance needs to be struck so as to achieve the well-recognized long-term instrumentalist goal of promoting and creating a wide array of informational works.

Indeed, the authors do repeatedly characterize the policy questions as ones of balance, rather than choice: "The task of intellectual property protection has always been difficult, attempting as it does to achieve a finely tuned balance: providing authors and publishers enough control over their work that they are motivated to create and disseminate, while seeking to limit that control so that society as a whole benefits from access to the work."[47] Nevertheless, the problem with the book's title is more than just a semantic disagreement or an under-appreciation of literary license – close readers or linguistic purists who are drawn to the book by its alliterative title are likely to wonder, where is the dilemma?[48]

In sum, despite its many strengths, *The Digital Dilemma* could have bene-

45. *Id.* at 13. Locks and fences are useful mechanisms (but not panaceas) for protecting physical property, but that obvious analogy is not discussed except in a footnote in one of the appendices. *See id.* at 316 n.9.

46. *See id.* at 153-76. For a readable discussion of these issues, see generally B. SCHNEIER, SECRETS AND LIES: DIGITAL SECURITY IN A NETWORKED WORLD (2000).

47. THE DIGITAL DILEMMA, *supra* note 15, at 24; *see also id.* at 2 ("The challenge is in striking and maintaining the balance, offering enough control to motivate authors, inventors, and publishers, but not so much control as to threaten important public policy goals"); *id.* at 22 ("Intellectual property will surely survive the digital age, although substantial time and effort may be required to achieve a workable balance between private rights and the public interest in information").

48. "Dilemma" has, of course, a more general, secondary usage (to mean a problem or predicament), though that meaning still fails to capture the notion of "balance." Perhaps "The Digital Dance: Intellectual Property in the Information Age" could also have expressed the images of delicate balance and intricate movement between technology and policy.

fited from a stronger, more rigorous final edit. The book could well have been an ideal vehicle for an independent, non-partisan, agenda-setting blueprint for a new Administration and Congress on a critical topic facing policymakers at all levels. Unfortunately, without a more forceful executive summary or more finely honed list of recommendations, the comprehensive perspective and insightful analysis contained in *The Digital Dilemma* may not reach its intended audiences. That shortcoming, regrettably, may represent a singular opportunity lost.

II. LAW AND NEW TECHNOLOGY: THE VIRTUES OF INCREMENTALISM

Whether *The Digital Dilemma* succeeds as a policy primer or not, it does contain a central, though easily overlooked, recommendation: "Legislators should not contemplate an overhaul of intellectual property laws and public policy at this time, to permit the *evolutionary process* [involving different kinds of digital intellectual property, business models, legal mechanisms, and technical protection services] the time to play out."[49] That suggestion – one of radical incrementalism – is powerful, both because it is counterintuitive, and because, when viewed in historical context, it is likely to produce a better melding of legal principles to new technological developments.

An incrementalist approach – one in which the law evolves through case-by-case adaptations of existing concepts, mixed with intermittent paradigm-shifts and legislative intervention – is counterintuitive because of the immediate and intense pressure on legislators, courts, and regulators to alter intellectual property rules in substantial ways to accommodate with new digital technologies.[50] A more cautious approach, however, permits courts and policymakers to understand more fully and accurately the new technology and its effects before altering fundamental legal concepts. This part of the Review sketches some preliminary thoughts on the important balance between the need for laws to change in response to technological developments and the risk of making incorrect assumptions or predictions about new technologies.

A. Examples of the Law Chasing Technology

Laws and legal institutions have long had to struggle with changes in technology. Some of the most illustrious instances are also the most infamous: In 1908, for example, the Supreme Court ruled that piano rolls (a precursor technology to the phonograph) did not infringe copyrights to the original compositions[51] – Congress later corrected that ruling in section 1(e) of the 1909 Copy-

49. *Id.* at 16, 225 (emphasis added).

50. *See, e.g., supra* note 4 and accompanying text.

51. *See* White-Smith Music Publishing Co. v. Apollo Co., 209 U.S. 1, 12 (1908) (concluding that "perforated sheets and other mechanical means of automatically producing music audibly are not in-

right Act.[52] In 1915, the Supreme Court held that motion pictures were not protected by the First Amendment[53] – that decision was later overruled.[54] In 1928, the Supreme Court famously held that telephone conversations (and hence wiretaps) were not subject to Fourth Amendment analysis[55] – that decision was, of course, also subsequently overruled.[56] And, in more modern times, a Georgia court noted (albeit in dictum) in 1996 that "a facsimile transmission does not satisfy the statutory requirement that notice be 'given in writing,'" because "[s]uch a transmission is an audio signal via a telephone line containing information from which a writing may be accurately duplicated, but the transmission of beeps and chirps along a telephone line is not a writing, as that term is customarily used."[57]

An interesting historical example of the law's struggle with new technologies is provided by the 19th century evolution of American tort law, in particular the rise of the doctrine of negligence. Lawsuits resulting from collisions between ships or horse-drawn carriages, and cases involving the spread of fire by sparks from railroad locomotives onto neighboring lands resulted in transformations by courts, which were responding to the rise of a more industrialized economy, of the traditional doctrine of strict liability for damage caused by property use into doctrines that focused on liability based on carelessness and causation.[58] The celebrated case of *The T.J. Hooper*[59] is an example of a court responding to new technology, albeit in a dramatic fashion, rather than an incremental, evolutionary way: In ruling that tug boat owners were not insulated from liability for harm caused by the failure to carry radio receiving sets, despite the then-prevailing custom, Judge Learned Hand not only proffered a

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fringements of copyrights upon the musical compositions which are thus audibly reproduced").

52. Copyright Act of 1909, 35 Stat. 1075, ch. 320 (Mar. 4, 1909).

53. *See* Mutual Film Corp. v. Industrial Commission of Ohio, 236 U.S. 230, 243 (1915) (holding that the First Amendment did not prohibit Ohio from establishing a motion picture censorship board and characterizing as "wrong or strained" the argument that the free speech and press provisions of the First Amendment applied to motion pictures).

54. *See* Joseph Burstyn, Inc. v. Wilson, 343 U.S. 495 (1952).

55. *See* Olmstead v. United States, 277 U.S. 438, 466 (1928) (opining that "the reasonable view is that one who installs in his house a telephone instrument with connecting wires intends to project his voice to those quite outside, and that the wires beyond his house and messages while passing over them are not within the protection of the Fourth Amendment").

56. *See* Katz v. United States, 389 U.S. 347 (1967).

57. Department of Transp. v. Norris, 222 Ga. App. 361, 362, 474 S.E.2d 216, 218 (1996), *rev'd on other grounds*, 268 Ga. 192, 486 S.E.2d 826 (1997). *But cf.* Howley v. Whipple, 48 N.H. 487, 488 (1869) (finding a telegraphed contract to be sufficient writing under the Statute of Frauds) ("It makes no difference whether th[e] operator writes the offer or the acceptance. . .with a steel pen an inch long attached to an ordinary penholder, or whether his pen be a copper wire a thousand miles long. In either case the thought is communicated to the paper by use of the finger resting upon the pen; nor does it make any difference that in one case common record ink is used, while in the other case a more subtle fluid, known as electricity, performs the same office"); Bazak Inernational Corp. v. Mast Industries, Inc., 535 N.E.2d 633 (N.Y. 1989) (assuming faxes to be writings under U.C.C. 2-201).

58. *See, e.g.*, MORTON J. HOROWITZ, THE TRANSFORMATION OF AMERICAN LAW, 1780-1860, at 85-89, 98-99 (1977).

59. 60 F.2d 737 (2d Cir. 1932).

bold prediction about the costs and benefits of creating and imposing a new technology-specific legal standard, but also advanced a more profound conceptual point – that what is legally reasonable under the circumstances can and should change with changes in technology.

As noted earlier in this Review, modern-day courts and lawyers are similarly struggling to fit new technologies into existing legal conceptual rules and categories. Here are but a few more examples: The extent to which the First Amendment protects the export of encryption source code turns in part on the expressive versus functional nature of such source code.[60] Regulation of indecent material or other material harmful to minors on the Internet challenges the traditional ways in which such material is regulated, consistent with free speech guarantees.[61] And advances in genetic technology have required courts and legislatures to re-evaluate fundamental concepts of anti-discrimination and family law.[62]

These examples illustrate the fact that the way in which the law (as interpreted by courts, as well as positive law in the form of legislative and regulatory rules) responds to new technology or to changes in existing technology can have important consequences. If the law responds too precipitously, market mechanisms, technological solutions, or other extralegal responses that may have been more effective may not have an opportunity to develop. More important, especially if the pace of technological change is rapid, judicial or legislative predictions of or assumptions about how the technology will develop and affect the law may be wide of the mark. On the other hand, to the extent judges or legislators wait too long to adapt the law to new circumstances, there can be societal harms and losses that result from the application of outdated legal rules to the new technology.[63] In addition, in the intervening time, societal

60. *Compare* Karn v. U.S. Dep't of State, 925 F. Supp. 1, 9 n.19 (D.D.C. 1996) (noting that "source codes are merely a means of commanding a computer to perform a function), *with* Junger v. Daley, 209 F.3d 481 (6th Cir. 2000) (finding computer source code to be protected by the First Amendment, but remanding for a balancing of national security interests and the interest in free exchange of encryption code), *and* Bernstein v. U.S. Dep't of Justice, 176 F.3d 1132 , 1141 (9th Cir. 1999) (finding encryption source code to be expressive for First Amendment purposes and concluding that the government's prepublication licensing scheme constituted an impermissible prior restraint on speech). *See generally* Robert Post, *Symposium: Encryption Source Code and the First Amendment*, 15 BERKELEY TECH. L.J. 713 (2000).

61. *See, e.g.*, Reno v. ACLU, 521 U.S. 844, 849 (1997) (striking down portions of the Communications Decency Act, Pub. L. No. 104-104, 501-502, 505, 508-509, 551-552, 110 Stat. 56, 133-43); ACLU v. Reno, 217 F.3d 162 (3d Cir. 2000) (affirming district court's grant of preliminary injunction against enforcement of the Child Online Protection Act, Pub. L. No. 105-277, 112 Stat. 2681 (codified at 47 U.S.C. § 231)).

62. *See, e.g.*, William F. Mulholland, II & Ami S. Jaeger, *Genetic Privacy and Discrimination: A Survey of State Legislation*, 39 JURIMETRICS J. 317 (1999); Johnson v. Calvert, 5 Cal. 4th 84, 851 P.2d 776 (1993) (determining a child's "natural mother" under California law in the context of a surrogacy agreement); Davis v. Davis, 842 S.W.2d 588 (Tenn. 1992) (evaluating disposition of the cryogenically preserved product of in vitro fertilization, commonly referred to as "frozen embryos").

63. *Cf.* KARL N. LLEWELLYN, THE COMMON LAW TRADITION: DECIDING APPEALS 518 (1960) (noting societal cost "in delay and uncertainty in and legal discomfort or injustice to have the making or

expectations and market structures may become so entrenched that subsequent legal or policy changes may be either practically impossible or, if undertaken, socially disruptive. Even if legislative intervention is necessary, it is not always clear when and to what extent such intervention should occur.

B. The Power of Analogies and the Case for Intervention

The argument that legal responses to new technology should generally be left to the common law processes of incremental, case-by-case adjudication rests largely on the institutional competence of the judiciary to look beneath the surface tensions presented by new technological developments and to articulate and to apply the underlying bedrock legal principles at stake. Courts engage in this form of abstract reasoning, typically in the context of an adversarial proceeding involving concrete facts, in part by invoking analogies from which to analyze the new technological development.

In considering whether the government's interception of telephone conversations was a search or seizure under the Fourth Amendment, for example, the Court in *Olmstead* v. *United States*[64] rejected the analogy that such an interception was akin to the opening of a sealed letter in the mail. Rather, the Court reasoned, "[b]y the invention of the telephone, 50 years ago, and its application for the purpose of extending communications, one can talk with another at a far distant place. . . The intervening wires are not part of [the defendant's] house or office any more than are the highways along which they are stretched."[65] The Court's property-centric approach to interpreting the Fourth Amendment, as illustrated by the physical-highway analogy, led to cases in which the Fourth Amendment analysis turned on bizarre distinctions such as whether the instrument used to intercept the telephone conversation penetrated the defendant's property or not.[66]

The dissenters in these cases, and the majority in the case that eventually overruled *Olmstead*, recognized that the physical-intrusion approach to analyzing the interception of telephone conversations under the Fourth Amendment failed to capture the reality of the technology and, more importantly, failed to give effect to the underlying principles animating the Fourth Amend-

review of a rule wait upon the chance raising and appeal of issues one by one by dragging one"); LAWRENCE M. FRIEDMAN, A HISTORY OF AMERICAN LAW 22 (2d ed. 1985) ("The common law is therefore not only slow; it is impotent to effect certain kinds of significant legal change").

64. 277 U.S. 438 (1928).

65. *Id.* at 465.

66. *Compare* Goldman v. United States, 316 U.S. 129 (1942) (allowing evidence obtained by use of a "detectaphone," an instrument that allowed conversations in defendant's office to be overheard through the wall of an adjoining room, but which did not penetrate the office), *with* Silverman v. United States, 365 U.S. 505 (1961) (rejecting evidence obtained by use of a "spike mike," which penetrated the wall of an adjoining house and thus was an "unauthorized physical intrusion").

ment.[67] That it took several decades for the Court to reach this paradigm-shifting conclusion illustrates the power and effect an initial analogy can have on subsequent legal analyses involving new and evolving technological developments.

In intellectual property and other legal disputes involving the Internet and modern communication technologies, courts and litigants also often resort to analogies from the physical world to describe or explain elements of the online world. Applying the doctrine of "initial interest confusion" in trademark law, for example, the Ninth Circuit has analogized the use of another's trademark in a website's "metatags" (keywords embedded in a website's computer code that are searched when a user employs a search engine to look for certain content on the Internet) to the posting of a sign with another's trademark in front of one's store.[68] In disputes involving the use of automated software robots (computer programs that automatically search, copy, and retrieve content from websites on the Internet), courts have granted injunctive relief where the use of such search robots deprived the targeted computer system's owner of the use of a portion of its personal property (namely, the computer server and its system capacity), thereby constituting a trespass to chattels.[69] And computer source code, which, "though unintelligible to many, is the preferred method of communication among computer programmers," has been likened to a musical score, which likewise "cannot be read by the majority of the public but can be used as a means of communication among musicians."[70] There are, no doubt, many other examples of courts invoking similar comparisons between online

67. Justice Brandeis, for example, dissenting in *Olmstead*, emphasized the kind of intrusions that technological advances had made possible: "'[T]ime works changes, brings into existence new conditions and purposes.' Subtler and more far-reaching means of invading privacy have become available to the Government. Discovery and invention have made it possible for the Government, by means far more effective than stretching upon the rack, to obtain disclosure in court of what is whispered in the closet." *Olmstead*, 277 U.S. at 473 (Brandeis, J., dissenting). Similarly, dissenting in *Goldman*, Justice Murphy noted that "science has brought forth far more effective devices for the invasion of a person's privacy than the direct and obvious methods of oppression which were detested by our forebears and which inspired the Fourth Amendment." *Goldman*, 316 U.S. at 139 (Murphy, J., dissenting) (footnote omitted). And, of course in *Katz*, the case that overruled *Olmstead* and *Goldman*, Justice Stewart flatly ruled that electronic interception, regardless of whether there was a physical intrusion, constitutes a search or seizure under the Fourth Amendment. *See* Katz v. United States, 389 U.S. 347, 352-53 (1967); *see also id.* at 362 (Harlan, J., concurring) (*Goldman*'s "limitation on Fourth Amendment protection is, in the present day, bad physics as well as bad law, for reasonable expectations of privacy may be defeated by electronic as well as physical invasion"). New technology continues to challenge Fourth Amendment concepts to this day. *See* Kyollo v. United States, No. 99-8508 (U.S. argued Feb. 20, 2001) (reviewing whether the government's use of a thermal imaging device violates the Fourth Amendment).

68. *See* Brookfield Communications, Inc. v. West Coast Entm't Corp., 174 F.3d 1036, 1064 (9th Cir. 1999).

69. *See, e.g.*, Register.com, Inc. v. Verio, Inc., 126 F. Supp. 2d 238, 249-51 (S.D.N.Y. 2000); eBay, Inc. v. Bidder's Edge, Inc., 100 F. Supp. 2d 1058, 1069-72 (N.D. Cal. 2000); Compuserve, Inc. v. Cyber Promotions, Inc., 962 F. Supp. 1015, 1022. A separate but related analogy – between "cyberspace" and real space – has been the subject of much academic debate. *See, e.g.*, Lawrence Lessig, *The Zones of Cyberspace*, 48 STAN. L. REV. 1403, 1403 (1996); David R. Johnson & David Post, *Law and Borders – The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367, 1375 (1996).

70. Junger v. Daley, 209 F.3d 481, 484 (9th Cir. 2000).

technologies and offline analogues to explain their reasoning or to "translate" values and norms from one context to another.[71]

To be sure, the reactive, incrementalist model of common law decision-making places great weight on a generalist judiciary in fashioning appropriate responses to new technology. Because judges typically have a generalist background and, more to the point, may not have scientific or technical training (or even a background in intellectual property law), they are in many ways the least likely to be expert in any given area of new technology. In areas where scientific evidence is presented, for example, courts routinely struggle with the "battle of the experts," made more difficult in recent years by the Supreme Court's admonition that trial courts take a more activist role in separating scientific-evidence wheat from scientific-evidence chaff by assessing the processes and methodologies behind the type of expert evidence at issue.[72] The trepidation expressed by the Ninth Circuit on remand in *Daubert v. Merrell Dow Pharmaceuticals, Inc.* is not atypical: "[T]hough we are largely untrained in science and certainly no match for any of the witnesses whose testimony we are reviewing, it is our responsibility to determine whether those experts' proposed testimony amounts to 'scientific knowledge,' constitutes 'good science,' and was 'derived by the scientific method.' The task before us is more daunting still when the dispute concerns matters at the very cutting edge of scientific research . . . . Mindful of our position in the hierarchy of the federal judiciary, we take a deep breath and proceed with this heady task."[73]

On the other hand, their generalist background and the common law context in which they operate may be precisely why courts are in a better position to ensure that the law responds to new technology in an appropriate way.[74] The hesitation and humility expressed by courts when dealing with new technology may in fact be the key to their providing answers that eventually endure. One appellate court has, for example, warned against "excessive rigidity when applying the law in the Internet context; emerging technologies require a flexible approach."[75]

There are, of course, costs that must be borne while the legal process of

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71. The notion of "translation" comes from LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 111-21 (1999), which has a much more lucid discussion of the *Olmstead* to *Katz* line of cases.

72. *See* Kumho Tire Co. v. Carmichael, 119 S. Ct. 1167 (1999); Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993).

73. Daubert v. Merrell Dow Pharmaceuticals, Inc. 43 F.3d 1311, 1316 (9th Cir. 1995), *cert. denied*, 516 U.S. 869 (1995).

74. For observations on how courts respond to cases involving scientific or technological issues, see Abner J. Mikva, *Shotgun Wedding: When Science Went Legal*, TECHCOUNSEL 74, Mar. 12, 2001; Debra Baker, *Learning High. Tech @ the Bench*, 86 A.B.A.J. 52 (Nov. 2000). The classic work on this issue is Sheila Jasanoff & Dorothy Nelkin, *Science, Technology, and the Limits of Judicial Competence*, 214 SCIENCE 1211 (1981), *reprinted in* SCIENCE AND LAW: AN ESSENTIAL ALLIANCE 15 (William A. Thomas ed., 1983).

75. *Brookfield Communications*, 174 F.3d at 1054.

case-by-case adjudication plays itself out, but the resulting incremental analysis and interpretation of existing law among different courts creates a multi-party conversation that tends toward mid-course corrections as new facts emerge and new theories are debated. These corrections serve as feedback to other law-interpreting or law-making institutions, so that disconnections between the law and changes in technology do not persist and can be corrected. Congress responded to the advent of digital audio tape recorders, for example, with the Audio Home Recording Act of 1992,[76] and a district court ruling that highlighted a gap in existing copyright law led Congress to pass the No Electronic Theft Act of 1997.[77] It is too soon to know whether these and other more recent legislative efforts (such as the Digital Millennium Copyright Act of 1998) have been the right responses to new digital technologies, but it is clear that the more rapidly the technology or its impacts change, the more critical this feedback loop is to ensure that the law responds adequately to those changes.

III. CONCLUSION

This Review commits one of the sins identified in *The Digital Dilemma*: It examines the problem of intellectual property law and digital information largely from a single perspective – a legal/policy perspective – and even then it does so in a cursory manner. The greatest strength of *The Digital Dilemma* is that it is a thorough and thought-provoking analysis of these issues from a variety of perspectives. Although its format and style make for heavy reading, its policy conclusions and recommendations are reasoned, coherent, and appropriately cautious of sweeping change or predictions.

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76. 17 U.S.C. § 1001 *et seq.* (Supp. V 1993) (requiring a serial copy management system in digital recording devices to permit first generation digital copying of sound recordings, but to prevent the making of digital copies from copies).

77. 17 U.S.C. § 506(a)(2); 18 U.S.C. § 2319(b)(2) (1997). In United States v. LaMacchia, 871 F. Supp. 535 (D. Mass. 1994), the district court dismissed an indictment against a graduate student who operated an electronic bulletin-board service over the Internet that allowed users to send or obtain copyrighted software programs. Ruling that the then-existing criminal copyright law, 17 U.S.C. § 506, did not apply because the defendant did not act for "commercial advantage or private financial gain" (an element of the offense), the court invited Congress to remedy this gap in the law. The resulting statute creates a new criminal offense that covers the unauthorized distribution or reproduction of copies of copyrighted works, regardless of whether the distributor intends to profit from the activity.

Another example of a court signaling a legislative gap is Twentieth Century Music Corp. v. Aiken, 422 U.S. 151 (1975), where the Court considered whether a small fast-food shop that played a radio for its customers infringed copyrights on the music played to the shop's customers. The dissent noted that "[t]here can be no really satisfactory solution to the problem presented here, until Congress acts in response to longstanding proposals. . . . We must attempt to apply a statute designed for another era to a situation in which Congress has never affirmatively manifested its view concerning the competing policy considerations involved. . . . '[T]he fact that the Copyright Act was written in a different day, for different factual situations, should lead us to tread cautiously here.'" *Id.* at 167-68 (Burger, CJ., joined by Douglas, J., dissenting) (citation omitted). Congress responded by enacting section 110(5) of the Copyright Act, Pub. L. No. 94-553, 17 U.S.C. §§ 101 *et seq.* (1976), which provided that the playing of music under circumstances similar to those in *Aiken* was not a copyright infringement.

In discussing whether downloading and sharing copyrighted works through the Internet constitutes fair use of such works, for instance, the authors note simply that "[a]nswers may arise over time in piecemeal fashion."[78] That observation, perhaps more than any grand analytic theory or policy framework, may be the most anyone can say about how the law will respond to the new information technologies of today. Such an incrementalist approach to law and new technology, coupled with legislative intervention or judicial paradigm-shifting when existing doctrines prove unworkable or yield unintended consequences, may ultimately prove to be the best model for ensuring that the law keeps up with technological change.

78. THE DIGITAL DILEMMA, *supra* note 15, at 49.