

The Doctrinal Toll of “Information as Speech”

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Courts over the past two decades have reached a near consensus that computer code, along with virtually every flow of data on the Internet, is “speech” for First Amendment purposes. Today, newer information technologies such as 3D printing, synthetic biology, and digital currencies promise to remake other spheres of non-expressive economic activity in the Internet’s image. The rush to claim First Amendment protections for these non-expressive but code-dependent technologies has already begun with a lawsuit claiming First Amendment privileges for the Internet distribution of 3D-printable guns. Many similar suits will surely follow, all pursuing the common dream of a future-shocked Lochner for a highly informatized and thoroughly deregulated economy.

This Article argues that the theory of these lawsuits poses little genuine risk to the regulatory state. Instead, the threat is to the clarity and strength of core First Amendment principles. In theory, courts will test regulations of technologies such as digital currencies under the same strict standards that define mainstream First Amendment doctrine. But pragmatic concerns about the government’s ability to regulate economic affairs will put pressure on the same courts to dilute those standards in practice. Over time, these diluted strains will find their way back to the mainstream of First Amendment litigation. The Article concludes with recommendations to mitigate the damage.

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INTRODUCTION

Justice Kennedy has written for a Supreme Court majority of a “rule that information is speech”¹: a “rule” that, taken at face value, announces the broadest possible vision of the First Amendment’s scope. In doing so, he drew on decades of precedent in lower courts holding unanimously that computer code is speech because of its own informational content.² Those cases, in turn, draw on case law that has expanded free speech’s empire every year into increasingly distant and exotic territories. And if history is any guide, the scope of free speech can only become more inclusive; one is hard pressed to produce an example in the case law of a *contraction* in coverage.

The “rule that information is speech” hitches the inexorable expansion of First Amendment coverage to a much quicker and less predictable dynamic—namely, the accelerating pace of technological change. So far, the surge of new market-shattering information technologies—digitally distributed news, music, and movies, as well as social media—has raised few truly unusual First Amendment questions.³ But newer information technologies such as 3D printing,

1. Sorrell v. IMS Health Inc., 131 S. Ct. 2653, 2667 (2011).

2. See, e.g., Bernstein v. U.S. Dep’t of State, 922 F. Supp. 1426, 1436 (N.D. Cal. 1996) (holding that source code is speech under the First Amendment); see also Junger v. Daley, 209 F.3d at 484–85 (6th Cir. 2000) (“Because computer source code is an expressive means for the exchange of information and ideas about computer programming, we hold that it is protected by the First Amendment.”); Sony Computer Entm’t Inc. v. Connectix Corp., 203 F.3d 596, 602 (9th Cir. 2000) (recognizing that object code may be copyrighted as expression under 17 U.S.C. § 102(b) (2012)); United States v. Elcom Ltd., 203 F. Supp. 2d 1111, 1126 (N.D. Cal. 2002) (“While there is some disagreement over whether object code, as opposed to source code, is deserving of First Amendment protection, the better reasoned approach is that it is protected. Object code is merely one additional translation of speech into a new, and different, language.”).

3. This depends heavily on your definition of “unusual.” I take cases such as *Brown v. Entertainment Merchants Ass’n*, 131 S. Ct. 2729 (2011), which dealt with the First Amendment status of violent video games, to be “ordinary” rather than “unusual” in that despite their high-

synthetic biology, and digital currencies promise to remake other spheres of quintessentially economic activity in the Internet’s image. There is no reason to think that the pace of technological invention and adoption is slowing; to the contrary, these are trends that by various measures follow exponential curves.⁴ The law as it now stands implies strongly that the First Amendment will be implicated any time the government sets out to regulate these new informatic markets: a theory that at the time of this writing is already being litigated in federal court.⁵

Such concerns have prompted Justice Breyer and several academic commentators to warn of a new *Lochner*ism in First Amendment clothing.⁶ These warnings may be apt in a scenario in which technological progress stops, the issues remain the same, and the deregulation is limited to certain new informatic markets. But that is an unlikely scenario. The more probable scenario is one in which new informatic markets continue, as they have for decades, to *replace* ever-larger segments of the national economy. Zealous protections of “information as speech” in such an environment could turn the clock back to *Lochner*, but it is unrealistic to suppose that most judges are zealots of that sort. Instead, my concern is that if the First Amendment is pulled on too hard as a pry bar against the government’s regulatory powers, then the freedom of speech will be made to bend before those powers are dislodged.

In this Article, I argue that a rapid expansion of the First Amendment mission into what was only recently considered science fiction territory is likely to produce dilutions at the core of free speech doctrine.

tech trappings, they still deal overwhelmingly with the same sorts of expressive concerns courts have confronted for decades.

4. See discussion *infra* notes 133–135.

5. See discussion *infra* notes 12–15.

6. See *IMS Health*, 131 S. Ct. at 2679–85 (Breyer, J., dissenting) (“Moreover, given the sheer quantity of regulatory initiatives that touch upon commercial messages, the Court’s vision of its reviewing task threatens to return us to a happily bygone era when judges scrutinized legislation for its interference with economic liberty. History shows that the power was much abused and resulted in the constitutionalization of economic theories preferred by individual jurists. . . . At best the Court opens a Pandora’s Box of First Amendment challenges to many ordinary regulatory practices that may only incidentally affect a commercial message. At worst, it reawakens *Lochner*’s pre-New Deal threat of substituting judicial for democratic decision making where ordinary economic regulation is at issue.”); Robert Post & Amanda Shanor, *Adam Smith’s First Amendment*, 128 HARV. L. REV. 165, 166–67 (2015) (“Across the country, plaintiffs are using the First Amendment to challenge commercial regulations, in matters ranging from public health to data privacy. It is no exaggeration to observe that the First Amendment has become a powerful engine of constitutional deregulation. The echoes of *Lochner* are palpable.”); Richard Samp, *Sorrell v. IMS Health: Protecting Free Speech or Resurrecting Lochner?*, 2011 CATO SUP. CT. REV. 129.

Concerns of dilution are not new; Justice Powell first warned thirty-eight years ago of the possibility of dilution as First Amendment coverage expanded into new areas of commercial speech.⁷ What is new is the breakneck speed with which technologies emerge that raise First Amendment questions. When Justice Powell wrote nearly forty years ago, the expansion of First Amendment coverage was driven by jurisprudential and social factors, and perhaps by some inborn expansionary drive in American free speech law itself. But however fast the expansion may have seemed at the time, it nonetheless came on slower than the exponential, asymptotic growth that characterizes technological change in the early twenty-first century.⁸ Linked with a strong commitment to “information” or “data” as speech, the growth in the First Amendment’s coverage—or at least its *perceived* coverage, in an area where perceptions count for a great deal—is geared to technological changes that will far outpace the common law’s capacity to work itself pure.

I will argue that the courts will have a hard time avoiding the crisis that I describe. The underlying error behind the overextension of First Amendment coverage is clear in theory: the courts have too often assumed that the Free Speech Clause extends blindly to speech, communication, or information, *per se*—an ontological approach—rather than to a set of constitutionally significant social contexts.⁹ But in practice, the ontological treatment of the scope of the First Amendment is too deeply embedded in tradition for the courts to abandon in the near future.

This Article proceeds in two Parts. In Part I, I discuss the ontological approach to First Amendment coverage that Justice Kennedy describes as the “rule that information is speech.” I begin with a short critique of this “rule,” which I argue has almost no theoretical merit as a starting position. I nonetheless argue that the rule, over a long run of cases, develops almost inevitably from courts’ attempts to decide First Amendment cases under neutral principles. I argue that the

7. *Ohralik v. Ohio State Bar Ass’n*, 436 U.S. 447, 456 (1978) (“To require a parity of constitutional protection for commercial and noncommercial speech alike could invite dilution, simply by a leveling process, of the force of the Amendment’s guarantee with respect to the latter kind of speech. Rather than subject the First Amendment to such a devitalization, we instead have afforded commercial speech a limited measure of protection, commensurate with its subordinate position in the scale of First Amendment values, while allowing modes of regulation that might be impermissible in the realm of noncommercial expression.”).

8. See discussion *infra* notes 133–135.

9. Robert Post, *Recuperating First Amendment Doctrine*, 47 STAN. L. REV. 1249, 1250 (1995).

commitment to neutrality, over time, produces a body of doctrine that is at once eclectic in coverage and formal in application. Maximalist coverage rules such as the “rule that information is speech” emerge mirage-like from the convergence of these tendencies. At the same time, this same convergence between eclecticism and formalism tends to overwhelm formal rules and standards by burdening them with situations they were not designed to bear. The result is doctrinal dilution.

In Part II, I apply Part I’s lessons to up-and-coming information technologies that will eventually demand regulation. I introduce three types of highly informatized economic activity that are likely to produce First Amendment litigation in the coming decades. I then offer a hypothetical, loosely based on currently pending litigation, to demonstrate the various ways that entrepreneurial litigation surrounding highly informatized economic activity could result in a dilution of more traditional speech protections. Finally, I discuss what it would take for the courts to steer clear of, or at least mitigate, a dilution crisis.

I. THE RULE THAT INFORMATION IS SPEECH

The most fundamental thing a lawyer can say about the First Amendment’s place in the modern Constitution is that the government has a freer hand to regulate economic markets than it does to regulate speech. Much, if not most, of the drama in the First Amendment story concerns the ongoing negotiation of a bleeding boundary between those two categories: purely economic matters on one side, and speech on the other. The “rule that information is speech” represents one attempt to draw that boundary, and many courts have proceeded on the assumption that it is well drawn. But the boundary is not well drawn, and it threatens to dissolve the basic distinction between markets and speech that gives meaning to the First Amendment’s protection.

If the first obvious shortcoming of the information rule is its indefiniteness—what is “information”?—then the second obvious shortcoming is its yawning overinclusiveness. Suppose that “information” means “facts,” which is the way that Justice Kennedy seems to use the word in *Sorrell v. IMS Health*.¹⁰ On that reading, the information rule is hard to reconcile with the existence of many areas of

10. See *IMS Health*, 131 S. Ct. at 2667 (“[T]he creation and dissemination of information are speech within the meaning of the First Amendment. Facts, after all, are the beginning point for much of the speech that is most essential to advance human knowledge and to conduct human affairs.” (internal citations omitted)).

law, from antitrust to workplace sexual harassment, in which the government regulates the communication of facts in a content-discriminatory manner without triggering the application of First Amendment principles.¹¹ The information rule applied consistently would imply that those regulations should be subjected to the strictest scrutiny known to American law.

The absurdity escalates when the information rule is applied to computer code. Consider the now-pending litigation between the State Department and Defense Distributed, the organization behind the 3D-printed gun. In May 2013, Defense Distributed designed and posted on its website the computer-aided design (“CAD”) files—digital blueprints—needed to print “the Liberator,” the first fully printable handgun.¹² Three days later the State Department sent Defense Distributed a letter demanding that it remove the Liberator and other weapons-related files from its website. In a rather awkward fit to a novel problem, the State Department argued that posting the files online may have amounted to an unauthorized “export” of “technical data” covered by the International Trade in Arms Regulations (“ITAR”). It then directed Defense Distributed to submit the files to the Directorate of Defense Trade Controls (“DDTC”), which would determine whether the files were covered by ITAR’s export-restricted “Munitions List.”¹³

Defense Distributed now characterizes this action as a prior restraint exercised on a content-discriminatory basis against “speech about

11. *Reed v. Town of Gilbert, Ariz.*, 135 S. Ct. 2218, 2234–35 (2015) (Breyer, J., concurring in judgment) (“Consider a few examples of speech regulated by government that inevitably involve content discrimination, but where a strong presumption against constitutionality has no place. Consider governmental regulation of securities, *e.g.*, 15 U.S.C. § 78l (requirements for content that must be included in a registration statement); of energy conservation labeling-practices, *e.g.*, 42 U.S.C. § 6294 (requirements for content that must be included on labels of certain consumer electronics); of prescription drugs, *e.g.*, 21 U.S.C. § 353(b)(4)(A) (requiring a prescription drug label to bear the symbol “Rx only”); of doctor-patient confidentiality, *e.g.*, 38 U.S.C. § 7332 (requiring confidentiality of certain medical records, but allowing a physician to disclose that the patient has HIV to the patient’s spouse or sexual partner); of income tax statements, *e.g.*, 26 U.S.C. § 6039F (requiring taxpayers to furnish information about foreign gifts received if the aggregate amount exceeds \$10,000); of commercial airplane briefings, *e.g.*, 14 CFR § 136.7 (2015) (requiring pilots to ensure that each passenger has been briefed on flight procedures, such as seatbelt fastening); of signs at petting zoos, *e.g.*, N.Y. Gen. Bus. Law Ann. § 399–ff(3) (West Cum. Supp. 2015) (requiring petting zoos to post a sign at every exit “‘strongly recommend[ing] that persons wash their hands upon exiting the petting zoo area’”); and so on.”).

12. It posted CAD files of “a number of gun-related items, including a trigger guard, grips, two receivers, a magazine for AR-15 rifles, and a handgun.” Complaint at 6, *Def. Distributed v. U.S. Dep’t of State*, No. 1:15-CV-372 (W.D. Tex. May 6, 2015).

13. See generally *Defense Distributed v. U.S. Department of State*, JOSH BLACKMAN’S BLOG, <http://joshblackman.com/blog/about-josh/defense-distributed-v-u-s-department-of-state/> (last visited Mar. 9, 2016).

guns.”¹⁴ It goes so far, in fact, as to argue that its extra-special First Amendment-Second Amendment “hybrid claim” deserves even closer consideration than the intense scrutiny a prior restraint claim would normally merit: “[t]he first two Amendments,” argues Defense Distributed, “work in tandem to protect expressive content about the right to keep and bear arms.”¹⁵ In the long run, Defense Distributed’s argument implies that manufacturing methods such as 3D printing should be protected more zealously from regulation than anything seen in the *Lochner* era. And as other technologies arrive that depend on the transmission of code—whether digital currencies or home-printed pharmaceuticals—even more deregulation will follow, culminating in an Ayn Rand-inspired fantasy world seemingly sprung from the imagination of a bedazzled college sophomore.

But this revolution all hangs from what on examination appears as a small thread: namely, the same “rule that information is speech” that the law so often ignores when the going gets tough.¹⁶ The First

14. See Memorandum of Points and Authorities in Support of Plaintiffs’ Motion for Preliminary Injunction at 23, *Def. Distributed*, No. 1:15-CV-372 (W.D. Tex. 2015) (“A speech restriction is ‘content-based if it require[s] enforcement authorities to examine the content of the message that is conveyed to determine whether a violation has occurred.’” (citing *McCullen v. Coakley*, 134 S. Ct. 2518, 2531 (2014))).

15. Memorandum of Points and Authorities in Reply to Defendants’ Opposition to Plaintiffs’ Motion for Preliminary Injunction at 12, *Def. Distributed*, No. 1:15-CV-372 (W.D. Tex. 2015) [hereinafter Memorandum in Reply]. This is a silly idea. In support of it, Defense Distributed’s attorneys cite dicta from *Employment Division v. Smith*, 494 U.S. 872 (1990) (the “peyote case”) that characterize cases implicating speech and association in conjunction with free exercise as deserving closer scrutiny than cases implicating free exercise alone. But that is not because the “hybrid claims” get super-protection, as Defense Distributed’s lawyers suggest; instead, it is because standalone free exercise claims get *no* protection. After all, *Smith* is where Justice Scalia famously announced that free exercise claims receive no heightened scrutiny at all. The discussion of hybrid claims is meant merely to distinguish cases in which free exercise claimants succeeded in the past: their success, Justice Scalia argues, owed not to free exercise, but to some other constitutional protection); *Id.* at 881 (“The only decisions in which we have held that the First Amendment bars application of a neutral, generally applicable law to religiously motivated action have involved not the Free Exercise Clause alone, but the Free Exercise Clause in conjunction with other constitutional protections, such as freedom of speech and of the press.”). A broader sort of silliness lies in the extreme formalism of the analogy. Justice Scalia’s discussion of hybrid claims cites cases such as *West Virginia State Board of Education v. Barnette*, 319 U.S. 624 (1943), in which Jehovah’s Witness schoolchildren won the freedom to opt out of a compulsory flag salute, or *Murdock v. Pennsylvania*, 319 U.S. 105 (1943), which invalidated a tax on solicitation as applied to the dissemination of religious ideas. What of any substance these cases have to do with a CAD file used to manufacture an AR-15’s lower receiver is unclear. But the entire theory of Defense Distributed’s suit relies on similar elevations of logic over sense.

16. See Daniel A. Farber & Philip P. Frickey, *Practical Reason and the First Amendment*, 34 UCLA L. REV. 1615, 1639 (1987) (“In purporting to answer [F]irst [A]mendment questions by deductive reasoning from foundational principles, first amendment theorists are consistent with

Amendment does not reach securities fraud, for example,¹⁷ or state requirements that petting zoos display signs recommending that visitors wash their hands.¹⁸ Indeed, the First Amendment concerns itself with only a “small subset”¹⁹ of legally mediated situations involving actual spoken speech.²⁰ The error of Defense Distributed and future similarly situated parties is to assume that the freedom of speech is grounded in nothing more than the blind, indiscriminate protection of communication in itself.²¹ One might as well invoke a First Amendment defense after knocking someone unconscious with a hardbound book.²²

But the information rule is no small thread, whatever its theoretical shortcomings. The lower courts have applied it automatically to computer code for decades.²³ And as I will soon explain, the

‘the rationalist ethos of our times.’ The pitfalls of this approach are aptly described by Robert Nozick: ‘Philosophers often seek to deduce their total view from a few basic principles, showing how all follows from their intuitively based axioms. The rest of the philosophy then strikes readers as depending upon these principles. One brick is piled upon another to produce a tall philosophical tower, one brick wide. When the bottom brick crumbles or is removed, all topples, burying those insights that were independent of the starting point.’”)

17. See Wendy Gerwick Couture, *The Collision Between the First Amendment and Securities Fraud*, 65 ALA. L. REV. 903, 905–06 (2014) (“[L]itigants have been largely unsuccessful in arguing that the First Amendment has any bearing on securities fraud liability. For example, the Fourth Circuit recently summarily rejected this argument: ‘Punishing fraud, whether it be common law fraud or securities fraud, simply does not violate the First Amendment.’ (quoting SEC v. Pirate Investor LLC, 580 F.3d 233, 255 (4th Cir. 2009)); Frederick Schauer, *The Boundaries of the First Amendment: A Preliminary Exploration of Constitutional Salience*, 117 HARV. L. REV. 1765, 1806 (2004).

18. *Reed v. Town of Gilbert, Ariz.*, 135 S. Ct. 2218, 2235 (2015) (Breyer, J., concurring in the judgment) (discussing N.Y. Gen. Bus. Law Ann. § 399–ff(3) requiring petting zoos to post a sign at every exit “strongly recommend[ing] that persons wash their hands upon exiting the petting zoo area”).

19. If it were otherwise, the First Amendment would reach almost all human activity rather than the “small subset” of communicative activity that it actually does. Frederick Schauer, *Harry Kalven and the Perils of Particularism*, 56 U. CHI. L. REV. 397 (1989) (book review).

20. See Shanor, *supra* note 6, at 179 (“If speech is understood to mean human communication, it is literally everywhere. If the regulation of every speech act is a constitutional question, we must hand over our government to what Justice Scalia trenchantly calls a ‘black-robed supremacy.’ We must abandon the possibility of meaningful self-determination and turn back our democracy to the juristocracy that controlled society in the days of Lochner.”).

21. See generally Post, *supra* note 9, at 1255 (“First Amendment analysis is relevant only when the values served by the First Amendment are implicated. These values do not attach to abstract acts of communication as such, but rather to the social contexts that envelop and give constitutional significance to acts of communication.”).

22. See generally Lee Tien, *Publishing Software as a Speech Act*, 15 BERKELEY TECH. L.J. 629, 638 (2000) (arguing that First Amendment coverage should attach not to software in itself, but to “illocutionary acts”).

23. See *infra* notes 24–37.

information rule is as firmly rooted in the history of First Amendment practice as it is detached from free speech theory—so much so that in my view, the Supreme Court is in no position to cut it loose. Before discussing the ideological roots of the information rule, I will discuss the history of its application to software.

A. The “Rule” and Software

The years just before and after the turn of the century saw a brief but intense flurry of activity around the question of the status of computer code under the First Amendment. The cases rolled out in two cleanly divisible stages. Courts developed the information rule in the first stage, and initially issued judgments that protected certain instances of code sharing from regulation. But in the second stage, the courts appeared unwilling to follow the information rule through to its radical practical consequences. While claiming to adhere to the doctrine established in the early cases, these later courts consistently found, and continue to find, ways to uphold regulations of software.

The first stage dealt with a series of challenges—*Karn v. United States Department of State*,²⁴ *Bernstein v. United States Department of Justice*,²⁵ and *Junger v. Daley*²⁶—to national security-related export restrictions on cryptographic software. In *Karn*, the publisher of a well-known book titled *Applied Cryptography*²⁷ sought to enclose with the book’s print copy a diskette containing source code for a cryptographic algorithm. “Source code” refers to the format in which programmers write software. Software called “compilers” are used to convert this source code into “machine code,” the string of zeroes and ones that interfaces directly with a computer’s CPU. For our purposes, the key differences between source code and machine code are 1) source code is reasonably readable by human beings; and 2) source code must first be compiled into machine code before it can be used to operate a computer.²⁸

To ship the diskette outside the country, *Karn* first had to seek permission from the State Department under a procedure known as “commodity jurisdiction determination.” The point of this procedure

24. *Karn v. U.S. Dep’t of State*, 925 F. Supp. 1 (D.D.C. 1996).

25. *Bernstein v. United States*, 176 F.3d 1132 (9th Cir. 1999), *reh’g granted*, 192 F.3d 1308 (9th Cir. 1999).

26. *Junger v. Daley*, 209 F.3d 481 (6th Cir. 2000).

27. BRUCE SCHNEIER, *APPLIED CRYPTOGRAPHY* (1st ed. 1994).

28. See Kyle Langvardt, *The Replicator and the First Amendment*, 25 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 59, 115 n.158 (2014).

was to determine whether the diskette was a “defense article” subject to export controls.²⁹ The State Department determined that it was and forbade Karn to send the disk overseas. Karn sued.³⁰

An annoyed U.S. District Court for the District of Columbia telegraphed the outcome of the litigation in the opening paragraph of its opinion.

This case presents a classic example of how the courts today, particularly the federal courts, can become needlessly invoked, whether in the national interest or not, in litigation involving policy decisions made within the power of the President or another branch of the government. The plaintiff, in an effort to export a computer diskette for profit, raises administrative law and meritless constitutional claims because he and others have not been able to persuade the Congress and the Executive Branch that the technology at issue does not endanger the national security.³¹

Most of the opinion was then concerned with justiciability issues. The Court addressed Karn’s First Amendment theories only in hypothetical terms: *even if* the First Amendment covered the code contained on the diskette, the government’s action was at any rate content-neutral and could survive intermediate scrutiny.³²

The challengers in *Bernstein* and *Junger* fared much better. Both were academics—Bernstein a mathematics professor and Junger a law professor with a “computers and the law” course—and both challenged export determinations that would have prevented them from posting cryptographic source code on the web.

Bernstein was the first case to explicitly take on the question of coverage, with *Karn* having sidestepped it. The U.S. District Court for the Northern District of California dealt with the issue in extremely broad strokes, reasoning that

[l]anguage is by definition speech, and the regulation of any language is the regulation of speech. Nor does the particular language one chooses change the nature of language for First Amendment purposes. This court can find no meaningful difference between computer language, particularly high-level languages as defined above, and German or French. . . . Even object code, which directly instructs the computer, operates as a “language.”³³

29. See *Karn v. U.S. Dep’t of State*, 925 F. Supp. 1, 6 (D.D.C. 1996) (citing 22 C.F.R. §§ 120.4 and 121.1, category XIII(b)(1), Note (2015)).

30. *Karn*, 925 F. Supp. at 2–3.

31. *Id.*

32. *Id.* 8–13.

33. *Bernstein v. U.S. Dep’t of State*, 922 F. Supp. 1426, 1435 (N.D. Cal. 1996) (citations and

On review, the Ninth Circuit walked back the lower court’s overreach, clarifying that its opinion reached only source code shared by programmers.³⁴ But in *Junger*, meanwhile, the Sixth Circuit had taken up substantially the same line as the trial court in *Bernstein*:

The Supreme Court has expressed the versatile scope of the First Amendment by labeling as “unquestionably shielded” the artwork of Jackson Pollack, the music of Arnold Schoenberg, or the Jabberwocky verse of Lewis Carroll. Though unquestionably expressive, these things identified by the Court are not traditional speech. Particularly, a musical score cannot be read by the majority of the public but can be used as a means of communication among musicians. Likewise, computer source code, though unintelligible to many, is the preferred method of communication among computer programmers.³⁵

Bernstein and *Junger* taken together commit almost immediately to an extraordinarily broad criterion for coverage: if it is written in a language that someone *might* use to communicate, then it must be covered under the First Amendment. The same coverage principle appears to drive almost all subsequent First Amendment cases involving computer code.

One more sentence in *Junger* deserves particular attention because of the way in which it dignifies algorithms not just as means of communication, but as actual discussions about computer science: “Because computer source code is an expressive means for the exchange of *information and ideas about computer programming*, we

quotations omitted); *see also* *Universal City Studios, Inc. v. Reimerdes*, 111 F. Supp. 2d 294, 326 (S.D.N.Y. 2000) (striking, via a content-neutrality argument, Digital Millennium Copyright Act (“DCMA”) provision against trafficking in digital rights management (“DRM”) circumvention technologies). “It cannot seriously be argued that any form of computer code may be regulated without reference to First Amendment doctrine.” *Reimerdes*, 111 F. Supp. 2d at 326; *see also* *Junger v. Daley*, 209 F.3d 481, 484–85 (6th Cir. 2000) (“Because computer source code is an expressive means for the exchange of information and ideas about computer programming, we hold that it is protected by the First Amendment.”). Computer software is expression that is protected by the copyright laws and is therefore “speech” at some level, speech that is protected at some level by the First Amendment. *See* *Sony Computer Entm’t Inc. v. Connectix Corp.*, 203 F.3d 596, 602 (9th Cir. 2000) (recognizing that object code may be copyrighted as expression under 17 U.S.C. § 102(b)); *United States v. Elcom, Ltd.*, 203 F. Supp. 2d 1111, 1126 (N.D. Cal. 2002) (“While there is some disagreement over whether object code, as opposed to source code, is deserving of First Amendment protection, the better reasoned approach is that it is protected. Object code is merely one additional translation of speech into a new, and different, language.”).

34. *Bernstein v. U.S. Dep’t of Justice*, 176 F.3d 1132, 1145 (9th Cir. 1999), *reh’g granted*, 192 F.3d 1308 (9th Cir. 1999) (“We emphasize the narrowness of our First Amendment holding. We do not hold that all software is expressive.”).

35. *Junger*, 209 F.3d at 484–85 (citing *Hurley v. Irish-Am. Gay, Lesbian & Bisexual Grp.*, 515 U.S. 557, 569 (1995)).

hold that it is protected by the First Amendment.”³⁶ As Orin Kerr has pointed out, there is an obvious circularity in this formula that would imply that the First Amendment should reach every phenomenon in the universe: “everything is ‘an expressive means for the exchange of information and ideas’ about itself, and this is just as true in realspace as in cyberspace.”³⁷ Yet the “ideas about computer programming” line has persisted as a narrow, shaky bridge linking universal coverage for code to the venerable “marketplace of ideas” metaphor.

Later opinions continue to adhere to the coverage determinations made in *Bernstein* and *Junger* while revealing the protection that follows them to be rather limited in practice. These later cases deal with the Digital Millennium Copyright Act (“DMCA”) and its provisions extending legal protections to cryptography-based “digital rights management” copy-protection measures (“DRM”). DRM operates by “locking” a media file or storage medium so that it can be used only in ways that maximize profit for the owner of the intellectual property. The movie industry, for example, will lock DVDs sold in Chinese markets so they cannot be played in North American markets, a scheme intended to frustrate the development of a secondhand export market.³⁸ For another example, early versions of the iTunes music market sold music files that could only be copied to a maximum of five devices.³⁹

The First Amendment challengers in the second wave of code cases were parties who developed methods for cracking DRM and who then either posted the source code online or sought to sell it as software. In *Universal City Studios v. Reimerdes*, for instance, a party sought to distribute a DRM-cracking algorithm in connection with software designed to play encrypted DVDs on the open-source operating system Linux.⁴⁰

The several courts deciding these cases fell into a clean pattern: all agreed that the First Amendment was in play, frequently reciting the

36. *Junger*, 209 F.3d at 484–85 (emphasis added).

37. Orin S. Kerr, *Are We Overprotecting Code? Thoughts on First-Generation Internet Law*, 57 WASH. & LEE L. REV. 1287, 1291 (2000) (quoting *Junger*, 209 F.3d at 484–85).

38. See Peter K. Yu, *Region Codes and the Territorial Mess*, 30 CARDOZO ARTS & ENT. L.J. 187, 206–09 (2012) (discussing the price discrimination justification for use of regional codes in DVDs).

39. Symposium, *Panel II: Licensing in the Digital Age: The Future of Digital Rights Management*, 15 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1009, 1086 (2005).

40. *Universal City Studios, Inc. v. Reimerdes*, 111 F. Supp. 2d 294, 303–04 (S.D.N.Y. 2000), judgment entered by 111 F. Supp. 2d 346 (S.D.N.Y. 2000), *aff’d sub nom.* *Universal City Studios, Inc. v. Corley*, 273 F.3d 429 (2d Cir. 2001).

liturgy from *Bernstein*.⁴¹ Then, having determined that coverage was present, every opinion held the DMCA’s anti-circumvention rules to be content-neutral and therefore deserving only of intermediate scrutiny.⁴²

Doing so required the courts to adopt an unusually permissive definition of “content-neutral.” After all, if it is stipulated that code is speech, then it would seem that the DMCA singles out some of that speech for ill-treatment based on its content. The courts got around this line of argument by shifting the focus away from the law’s content-discriminatory application and toward the innocent governmental motives that had inspired the law’s enactment. Congress, the courts reasoned, was not concerned with suppressing any *expressive* aspect of DRM-cracking software. Instead, the point was to mitigate the negative economic “secondary effects” caused by that software’s functional aspect.⁴³ This secondary effects line of reasoning was borrowed from cases involving nude dancing, adult theaters, and other pariah expression associated with the sex industry,⁴⁴ and its use is a reliable signal that a judge believes strict scrutiny will produce an outcome that must be avoided.⁴⁵ It is now *de rigueur* in cases applying the First Amendment to computer code and, as discussed below, it continues to be required even after the Supreme Court in 2015 clearly signaled that

41. See, e.g., *Reimerdes*, 111 F. Supp. 2d at 326 (striking, via a content-neutrality argument, a DMCA provision against trafficking in DRM circumvention technologies); *Sony Computer Entm’t Inc. v. Connectix Corp.*, 203 F.3d 596, 602 (9th Cir. 2000) (recognizing that object code may be copyrighted as expression under 17 U.S.C. § 102(b) (2012); see also *United States v. Elcom Ltd.*, 203 F. Supp. 2d 1111, 1126 (N.D. Cal. 2002) (“While there is some disagreement over whether object code, as opposed to source code, is deserving of First Amendment protection, the better reasoned approach is that it is protected. Object code is merely one additional translation of speech into a new, and different, language.”).

42. See *Corley*, 273 F.3d at 454; *Elcom*, 203 F. Supp. 2d at 1128; *321 Studios v. Metro Goldwyn Mayer Studios, Inc.*, 307 F. Supp. 2d 1085, 1101–05 (N.D. Cal. 2004).

43. Basing the level of scrutiny on motive might make a good deal of sense, and Justice Kagan has argued that a motive inquiry is most often what courts are actually up to. See Elena Kagan, *Private Speech, Public Purpose: The Role of Governmental Motive in First Amendment Doctrine*, 63 U. CHI. L. REV. 413 (1996). But courts for the most part have maintained that governmental motive is not at issue in the content-discrimination inquiry. See generally *Reed v. Town of Gilbert, Ariz.*, 135 S. Ct. 2218 (2015); *Simon & Schuster, Inc. v. Members of the N.Y. State Crime Victims Bd.*, 502 U.S. 105, 117 (1991); *Police Dep’t of Chi. v. Mosley*, 408 U.S. 92 (1972).

44. Kagan, *supra* note 43, at 484–91.

45. *City of L.A. v. Alameda Books*, 535 U.S. 425, 448 (2002) (Kennedy, J., concurring) (characterizing the “secondary effects” test and its focus on motive as the touchstone of content-neutrality as “something of a fiction”); see also, e.g., LAURENCE TRIBE, *AMERICAN CONSTITUTIONAL LAW* §12-3, n.17 (2d ed. 1988) (“Carried to its logical conclusion, the doctrine could gravely erode [F]irst [A]mendment protections. . . . The *Renton* view will likely prove to be an aberration limited to the context of sexually explicit materials.”).

the secondary effects test should be retired.⁴⁶

The DMCA cases therefore appear at first impression to have made code into a de facto mid-value speech category, similar to the category of commercial speech under *Central Hudson v. Public Service Commission*,⁴⁷ which maxes out at intermediate scrutiny. This is because virtually any regulation of code that does not involve licensing will be classified under the DMCA cases' rubric as content-neutral. But it is still too early to make reliable predictions about its future application.

First, it remains unclear whether or how the prior restraint doctrine should apply to cases, such as *Karn*, *Bernstein*, *Junger*, and *Defense Distributed*, that involve any kind of preclearance scheme. At least one case that *did* involve licensing—namely, *Bernstein*—seems to stand for the proposition that the prior restraint doctrine applies with all of its usual force when a regulation of code involves any kind of governmental preclearance process.⁴⁸ This point should not be entirely surprising, as the strength of the prior restraint doctrine does not usually vary with the value of the speech category implicated.⁴⁹ Yet, the doctrine is not nearly as rigid as it is often made out to be: “content-neutral” parade permitting procedures, for instance, receive only the intermediate scrutiny traditionally due to time, place, and manner regulations. And at least one more code case—namely, *Junger*—suggests in dicta that only intermediate scrutiny is due to regulatory schemes that require preclearance of code.⁵⁰

Second, the meaning of intermediate scrutiny remains fluid. We know that the government's scheme for policing violations of intellectual property passes intermediate scrutiny in the DMCA cases. But it is hard to extrapolate from this point because of the quasi-immunity that copyright regulations seem to enjoy relative to First

46. See *infra* notes 48–54.

47. *Cent. Hudson Gas & Elec. Corp. v. Pub. Serv. Comm'n of N.Y.*, 447 U.S. 557, 564 (1980) (“The State must assert a substantial interest to be achieved by restrictions on commercial speech. Moreover, the regulatory technique must be in proportion to that interest. The limitation on expression must be designed carefully to achieve the State's goal. Compliance with this requirement may be measured by two criteria. First, the restriction must directly advance the state interest involved; the regulation may not be sustained if it provides only ineffective or remote support for the government's purpose. Second, if the governmental interest could be served as well by a more limited restriction on commercial speech, the excessive restrictions cannot survive.”).

48. *Bernstein v. U.S. Dep't of Justice*, 176 F.3d 1132, 1143–45 (9th Cir.), *withdrawn by* 192 F.3d 1308 (9th Cir. 1999).

49. See, e.g., *Times Film Corp. v. City of Chi.*, 365 U.S. 43, 84 (1961).

50. *Junger v. Daley*, 209 F.3d 481, 485 (6th Cir. 2000).

Amendment limitations.⁵¹ It would not be at all surprising to find that copyright-related governmental interests would weigh more heavily than other economic interests would in future cases involving code.

Finally, as discussed below, the Supreme Court has indicated in its 2015 decision in *Reed v. Gilbert*⁵² that secondary effects arguments are no longer valid. According to *Reed*, “[a] law that is content-based on its face is subject to strict scrutiny regardless of the government’s benign motive, content-neutral justification, or lack of animus toward the ideas contained in the regulated speech.”⁵³ If that is the case, then one should expect to begin seeing strict scrutiny applied to most laws that regulate computer code in any selective fashion. But as discussed below, the one judicial opinion to deal with computer code and the First Amendment after *Reed* seems to have ignored the new rule.⁵⁴

The one clear message to emerge from the turn-of-the-century code cases is simply that the First Amendment is implicated *somehow* whenever the government attempts to regulate the flow of computer code. If a court at this point were to hold that the First Amendment did not reach all uses of code, that court would almost certainly be overruled. No economic regulation of code is evaluated under anything less than intermediate scrutiny. That is the information rule, and in the lower courts, it is well-settled law.

B. Origins and Operation of the Information Rule

The question, then, is whether the lower courts’ treatment of computer code is only a minor invention of the lower courts, such that the Supreme Court could reverse course, or whether the treatment of code in the lower courts reflects a broader and more firmly rooted understanding of the First Amendment.

From the perspective of “theory,” the information rule seems to come from nowhere. Most lawyers could enumerate the canonical scholarly theories of First Amendment coverage: the search for truth; the democratic process; the right of self-realization; the check against an overreaching government.⁵⁵ Most would also agree that none of those

51. See *Eldred v. Ashcroft*, 537 U.S. 186, 267 (2003); *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 569 (1985).

52. *Reed v. Town of Gilbert*, Ariz., 135 S. Ct. 2218 (2015).

53. *Id.* at 2228.

54. See *infra* notes 200–202.

55. O. Lee Reed, *Is Commercial Speech Really Less Valuable Than Political Speech? On Replacing Values and Categories in First Amendment Jurisprudence*, 34 AM. BUS. L.J. 1, 3–4 (1996).

theories, taken on its own, can fully explain the operation of the law. But that is no reason to assume that *everything* is covered. There is a basic acknowledgment behind any attempt at a justificatory theory that the First Amendment does not apply in the same manner every time a person speaks, and that it does not always apply at all. The point of every attempt at a grand theory is to offer a teleological explanation for this heterogeneity. The information rule, on the other hand, denies at the outset that the heterogeneity exists, denies that the First Amendment is purpose driven, and holds instead that *ontology* rather than teleology drives coverage: that it is the simple presence of communication itself, or even of a medium of communication, that drives coverage.

Such an account of the First Amendment's scope cannot be mapped onto any but the most trivial interpretations⁵⁶ of what most lawyers think of, in the First Amendment context, as "theory." Yet it persists even as the courts have mostly rejected scholars' attempts to guide the development of the law through theory. And without any clear theoretical brake on the endlessly expanding range of litigation, entrepreneurial litigants make lavish demands. They argue that the First Amendment comes into play when a gun-rights activist uploads files for a printable firearm to the Internet for download;⁵⁷ when an employer wishes not to display OSHA warnings generally mandated by law;⁵⁸ when nude dancers are prohibited by law from touching their patrons;⁵⁹ or when a dress code outlaws backwards caps at the county fair.⁶⁰ It is rare for a judge to call such claims frivolous.

Courts have not always been as hospitable to free speech entrepreneurs as they are today. In the early twentieth century, various categories of expression that today receive robust protection were placed wholly beyond First Amendment consideration with little to no discussion. Various forms of entertainment, most prominently motion

56. By "trivial," I mean interpretations of coverage theories that result in so much overbreadth that they defeat the purpose of the initial line-drawing project. Downloading and printing guns, for example, has something to do with self-actualization in that it is probably a satisfying hobby; but the freedom of speech cannot possibly reach all satisfying hobbies. Or it could be said (and has been said) that the CAD file of a gun is "speech about guns" and that it should be protected so that the truth about how to build the best guns may be discovered. But, as discussed *supra* in the text accompanying notes 37–38, there is a circularity in the "speech about guns" argument that implies at its limit that all objects in existence should be covered.

57. See *supra* notes 12–16.

58. Nat'l Ass'n of Mfrs. v. NLRB, 846 F. Supp. 2d 34, 58 (D.D.C. 2012), *aff'd in part, rev'd in part*, 717 F.3d 947 (D.C. Cir. 2013); see also Leslie Kendrick, *First Amendment Expansionism*, 56 WM. & MARY L. REV. 1199, 1219 (2015).

59. Blue Movies, Inc. v. Louisville/Jefferson Cnty. Metro Gov't, 317 S.W.3d 23 (Ky. 2010).

60. Hodge v. Lynd, 88 F. Supp. 2d 1234, 1237 (D.N.M. 2000).

pictures, were casually written off.

For example, in *Mutual Film Corp. v. Industrial Commission of Ohio*, the Supreme Court wrote that films

indeed, may be mediums of thought, but so are many things. So is the theater, the circus, and all other shows and spectacles, and their performances may be thus brought by the like reasoning under the same immunity from repression or supervision as the public press made the same agencies of civil liberty. . . . We immediately feel that the argument is wrong or strained which extends the guaranties of free opinion and speech to the multitudinous shows which are advertised on the billboards of our cities and towns, and which regards them as emblems of public safety, to use the words of Lord Camden, quoted by counsel, and which seeks to bring motion pictures and other spectacle into practical and legal similitude to a free press and liberty of opinion.⁶¹

Indeed, the Court has treated the extension of First Amendment coverage to films as almost beneath its consideration. The discussion is remarkably cursory, and comes across as exasperated with an argument the Court obviously regards as unserious:

Counsel have not shrunk from this extension of their contention [But it] seems not to have occurred to anybody in [several cases heard in lower courts] that freedom of opinion was repressed in the exertion of the power which was illustrated. The rights of property were only considered as involved. It cannot be put out of view that the exhibition of moving pictures is a business, pure and simple, originated and conducted for profit, like other spectacles, not to be regarded, nor intended to be regarded by the Ohio Constitution, we think, as part of the press of the country, or as organs of public opinion.⁶²

The early commercial speech cases demonstrate even more starkly that the First Amendment entrepreneur bore a burden of persuasion that is totally unknown today. In *Railway Express Agency v. New York*, the Supreme Court did not even mention the First Amendment on facts raising what we would today consider a clear violation of commercial speech protections.⁶³ In *Valentine v. Chrestensen*, another commercial speech case, the defendant argued that his advertising handbills should

61. *Mut. Film Corp. v. Indus. Comm'n of Ohio*, 236 U.S. 230, 243–44 (1915).

62. *Id.* at 243.

63. *Railway Express Agency v. New York*, 336 U.S. 106, 107–08 (1949) (“No person shall operate, or cause to be operated, in or upon any street an advertising vehicle; provided that nothing herein contained shall prevent the putting of business notices upon business delivery vehicles, so long as such vehicles are engaged in the usual business or regular work of the owner and not used merely or mainly for advertising.”).

receive First Amendment protection because he had printed political language on their reverse side.⁶⁴ The Court again assumed, without discussion, that the advertising content had nothing to do with the First Amendment—so little, in fact, that it deprived the handbills’ political content of protection by association as well.⁶⁵

The Court does not in either *Valentine* or *Railway Express* discuss any prospect whatsoever that advertisements might deserve First Amendment consideration. The message is that further arguments to extend First Amendment protections to advertisements or films should be considered frivolous, if not sanctionable. Commercial speech and films at that time occupied a far lower station in the free speech hierarchy than today’s “unprotected categories” of fighting words, and so on: they were not only *unprotected*, but *unexamined*.

1. Neutrality as an Expansionary Force

It is worth reflecting on how the law might have come from there to here. The emergence of today’s expansive doctrine from the early restrictive doctrine can be understood partially as the product of neutrality as an ideal in First Amendment jurisprudence. Neutrality, in broad terms, is a logical prerequisite to any system of free speech: the whole concept of a freedom of speech implies a certain suspension of official judgment. At the very least, it must imply that the courts will not disfavor a speaker because he or she has taken the wrong side of a political controversy. It follows close behind that the courts should not make judgments as to taste or as to moral propriety.

All of this means that a Court exploring the meaning of the First Amendment’s Free Speech Clause has been forced from the beginning to justify the speech rights of speakers on the “wrong” side of politics, morality, or taste—speakers who include Communists,⁶⁶ white supremacists,⁶⁷ and crazed homophobic trolls.⁶⁸ The speech under consideration may have no intrinsic value, or its value may be of a sort to which a judge cannot be seen to identify. These cases, especially when they are not read with the benefit of time, make poor

64. *Valentine v. Chrestensen*, 316 U.S. 52 (1942).

65. *Id.* at 55 (“It is enough for the present purpose that the stipulated facts justify the conclusion that the affixing of the protest against official conduct to the advertising circular was with the intent, and for the purpose, of evading the prohibition of the ordinance. If that evasion were successful, every merchant who desires to broadcast advertising leaflets in the streets need only append a civic appeal, or a moral platitude, to achieve immunity from the law’s command.”).

66. *Elfbrandt v. Russell*, 384 U.S. 11, 23 (1966).

67. *Brandenburg v. Ohio*, 395 U.S. 444, 457 (1969).

68. *Snyder v. Phelps*, 562 U.S. 443 (2011).

advertisements for the value of free speech. They are therefore poor sites for the development of a free speech theory that would justify the freedom of speech on the ground that it is valuable. A case extending protection to a meeting of the Ku Klux Klan, for instance, does not demonstrate on its own terms any valuable contribution to the political process or the search for truth. It should come as no surprise that the Court does not defend the Klan in those terms. The politically inflammatory context, moreover, provides an incentive for a Court to present a unified front, which will likely mean sidestepping difficult or divisive questions of theory and deciding the question on a formal basis.⁶⁹ These considerations may help to explain why the Court seems to have put off the question of theory during the same decades of expansion when theory would seem to be the most necessary. It is just never the right time.

But a deeper reason for the lack of theory in the case law has to do with a basic tension between the concept of a limiting theory, on the one hand, and the commitment to neutrality, on the other. For Justice Holmes in his *Abrams* dissent, the suspension of judgment reflected an attitude of “doubt” as to “one’s premises.”⁷⁰ This is the meaning of his warning that “time has upset many fighting faiths.”⁷¹ Ultimately, that attitude of self-doubt implies that it is not enough to be skeptical as to the side you have taken in a debate; it also implies a degree of skepticism as to which debates and which modes of expression are the most worthy of protection.⁷² Yet these latter judgments—is the freedom of speech is about politics, self-realization, or the refinement of truth—are precisely the ones that a limiting theory requires. So while it would go too far to say that theory and neutrality are completely incompatible—they are not—it is nonetheless fair to say that a jurisprudence of free speech, once it has grown enough to stand on its own, develops a sort of allergy to theoretical limitation.

69. Consider Professor Wechsler in his famous *Toward Neutral Principles of Constitutional Law*: “I realize that nine men often find it easier to reach agreement on result than upon reasons and that such a difficulty may be posed within this field. Is it not preferable, however, indeed essential, that if this is so the variations of position be disclosed?” Herbert Wechsler, *Toward Neutral Principles of Constitutional Law*, 73 HARV. L. REV. 1, 21 (1959).

70. *Abrams v. United States*, 250 U.S. 616, 630 (1919).

71. *Id.*

72. *Cohen v. California*, 403 U.S. 15, 25 (1971) (“[W]hile the particular four-letter word being litigated here is perhaps more distasteful than most others of its genre, it is nevertheless often true that one man’s vulgarity is another’s lyric.”); *Winters v. New York*, 333 U.S. 507, 510 (1948) (“What is one man’s amusement, teaches another’s doctrine.”); *W. Va. State Bd. of Educ. v. Barnette*, 319 U.S. 624, 632–33 (1943) (“A person gets from a symbol the meaning he puts into it, and what is one man’s comfort and inspiration is another’s jest and scorn.”).

Once the coverage of the speech freedom becomes sufficiently eclectic, it becomes impossible to identify any theoretical account that is simultaneously descriptive and precise. *Hurley v. Irish-American Gay, Lesbian & Bisexual Group* tells us, not controversially, that the artwork of Jackson Pollack, the music of Arnold Schoenberg, and the Jabberwocky verse of Lewis Carroll are all “unquestionably shielded.”⁷³ But why? It cannot be because the First Amendment is concerned with the political process, as Robert Bork maintained;⁷⁴ that account appears far too narrow. Perhaps abstract art aids the political process in some indirect sense—indeed, it probably does—and perhaps the political process theory of free speech could be widened to reflect that. But at such an extended range the theory becomes too inclusive and imprecise to offer any useful guidance. Every theoretical candidate for a free speech principle is susceptible to similar difficulties of calibration.

Judges and lawyers are therefore confronted with a First Amendment whose scope is always expanding and that lacks any identifiable justificatory principle. At the same time, the requirement of neutrality appears to demand that the judge swear off ideological commitments and decide free speech cases according to formal, arms-length principles wherever possible. And in the absence of any more limited formal principle, another idea appears to fill the void: namely, the idea that communication *as such* defines the scope of coverage.⁷⁵

It is only a short jump from the “communications” theory to a workable corollary: if the courts may not withhold coverage by reference to what is *on* the page, then some rough presumption of

73. *Hurley v. Irish-Am. Gay, Lesbian & Bisexual Group*, 515 U.S. 557, 569 (1995).

74. Robert Bork, *Neutral Principles and Some First Amendment Problems*, 47 IND. L.J. 1, 20–35 (1971).

75. *Id.*; see Stanley Fish, *Fraught with Death: Skepticism, Progressivism, and the First Amendment*, 64 U. COLO. L. REV. 1061, 1064–65 (1993) (“Public discourse [claim] an abstract usefulness that goes along with the abstract quality of their favored forum: the idea of ‘speech as pure communication . . . severed from its social context’ must be regarded ‘as articulating’ not a present reality but ‘a regulative ideal for the legal structure of public discourse.’ The ideal, that is, does not correspond to any form of social organization now extant, and that is exactly why it can be urged as the condition to which all forms of social organization should aspire. To put it in another (unappetizing) way, the chief recommendation of the regulative ideal is that it is empty; it is unencumbered by any commitments or desires that might recommend themselves to politically situated agents. It is, in Post’s words, formal and ‘extremely thin.’ Its values are ‘bloodless’—that is, they have insufficient substance to arouse anyone either to passionate affirmation or passionate denial—and perform the wholly negative function of shielding speakers from the enforcement of community standards.” (quoting and discussing Robert C. Post, *The Constitutional Concept of Public Discourse: Outrageous Opinion, Democratic Deliberation and Hustler Magazine v. Falwell*, 103 HARV. L. REV. 603 (1990), and Robert C. Post, *Cultural Heterogeneity and Law: Pornography, Blasphemy, and the First Amendment*, 76 CALIF. L. REV. 297 (1988)).

coverage must attach to the *page itself*. In other words, the law develops a working presumption of First Amendment coverage wherever the media for storing and communicating messages are used. This is a useful rule of thumb when applied, for instance, to the printed word; most attempts to regulate the use of *that* technology would seem to offend the values represented by at least one theoretical justification for free speech protection. As for the clear exceptions to the “rule”—mail fraud, for example—lawyers generally intuit that First Amendment defenses of those practices should not be put before a court. The result is that the bulk of the case law falsely appears to confirm the medium-based approach.⁷⁶

The natural successor to an outer boundary based on physical media is the metaphysical concept of “information.” Like a storage medium, the container concept of information makes it possible to talk about expression in the abstract as a quantity, without discussing its semantic content. And stated as such, a “rule that information is speech,” such as Justice Kennedy’s, offers a guarantee that the Court will not mistake differences in media for differences in the degree of protection, as in *Mutual Film Co.*⁷⁷

But the concept of information has different faces and different uses in different domains. Its liquidity invites courts to expand First Amendment coverage into new areas without any explicit discussion of a free speech principle. *Virginia Board of Pharmacy v. Virginia Citizens Consumer Council* provides a seminal example of the phenomenon.⁷⁸ There, in the Court’s first unambiguous endorsement of a First Amendment right to advertise,⁷⁹ Justice Blackmun framed the listener’s interest in learning about pharmaceutical prices as an interest in the receipt of information, adopting an analysis based primarily on the microeconomic axiom that efficient pricing depends on the perfect

76. See Schauer, *supra* note 17, at 1777–78 (“[To assume universal coverage outside the traditional ‘unprotected’ categories such as obscenity] is to be afflicted with the common ailment of spending too much time with the casebooks—defining the domain of constitutional permissibility by reference to those matters that have been considered viable enough to be litigated in, and close enough to be seriously addressed by, the courts, especially the Supreme Court. But if we are interested in the speech that the First Amendment does not touch, we need to leave our casebooks and the Supreme Court’s docket behind; we must consider not only the speech that the First Amendment noticeably ignores, but also the speech that it ignores more quietly.”); Fish, *supra* note 75.

77. *Mut. Film Corp. v. Indus. Comm’n of Ohio*, 236 U.S. 230, 243–44 (1915).

78. *Va. Bd. of Pharm. v. Va. Citizens Consumer Council*, 425 U.S. 748 (1976).

79. Its predecessor *Bigelow v. Virginia*, 402 U.S. 809 (1974), is often seen in retrospect as the first in this line, but on its own it could have been read as a substantive due process case.

availability of information about commodities. Notwithstanding Justice Holmes's familiar "marketplace" metaphor,⁸⁰ it must have been jarring at the time to see the freedom of speech justified in terms of its power to slash prices.

These theoretical shortcomings have not brought down the commercial speech doctrine, and they have brought down the information-based approach. To the contrary, both commercial speech and the information rule have for some time now applied continuing outward pressure to the basic boundary between speech and economic affairs. Every year, the First Amendment grows into a more formidable, deregulatory tool, and new information technologies promise to accelerate that growth. That deregulation will eventually come at the expense of doctrinal integrity.

2. Expansion and Dilution

Justice Powell warned in *Ohralik v. State Bar* that expanded First Amendment coverage in peripheral areas might lead to a dilution of protection closer to the core.⁸¹ *Ohralik* concerned an attorney who had violated professional ethics rules by soliciting clients in person in a personal injury matter. Writing for the majority, Justice Powell rejected the attorney's claim for First Amendment shelter:

To require a parity of constitutional protection for commercial and noncommercial speech alike could invite dilution, simply by a leveling process, of the force of the Amendment's guarantee with respect to the latter kind of speech. Rather than subject the First Amendment to such a devitalization, we instead have afforded commercial speech a limited measure of protection, commensurate with its subordinate position in the scale of First Amendment values, while allowing modes of regulation that might be impermissible in the realm of noncommercial expression.⁸²

Or, as Fred Schauer has put it,

[a] Court that believes it must apply the same definition or standard of regulability on grounds of offensive content to both broadcast television and Bob's XXX Adult Bookstore and Peepshow is, in reality, much more likely to allow less for Bob than it is to permit

80. See *Abrams v. United States*, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting) ("[T]he best test of truth is the power of the thought to get itself accepted in the competition of the market.").

81. *Ohralik v. Ohio State Bar Ass'n*, 436 U.S. 447, 468 (1978).

82. *Id.* at 456.

virtually everything for CBS during prime time or during halftime of the Super Bowl.⁸³

It is tempting to dismiss the dilution mechanism by pointing toward the overall arc of free speech law.⁸⁴ The scope of coverage was once stingy, and it is now generous with today’s Court looking like the most speech-protective Court yet.⁸⁵

Yet it is possible to demonstrate clear examples of dilution on a smaller scale. The pattern is always the same: the law announces a strongly protective doctrine with narrow coverage. Years later, the doctrine is applied in strange cases that resemble only abstractly the cases that inspired the doctrine in the first place. Applying the doctrine’s protections to a more diverse set of cases generates occasional undesired outcomes that were not within the contemplation of the Court when it announced the doctrine in the first place. The Court either defines down the terms of the doctrine or implements new doctrinal features that allow it to control its exposure to the undesired outcomes. Finally, the diluted doctrine is applied to the cases at its core. I will offer two brief examples.

a. Dilution Illustration 1: Content Neutrality

In *Renton v. Playtime Theaters*, the Supreme Court confronted a zoning ordinance that restricted adult movie theaters to a small and discontinuous area of Renton, Washington.⁸⁶ The ordinance was expressly content discriminatory in that it restricted the location only of theaters showing films that focused on “specified anatomical areas” or “specified sexual activities.”⁸⁷

As a general matter, such laws should trigger strict scrutiny; the lower level of scrutiny is reserved for laws, such as the volume-control

83. Frederick Schauer, *Toward an Institutional First Amendment*, 89 MINN. L. REV. 1256, 1272–73 (2005).

84. See Dale Carpenter, *The Value of Institutions and the Values of Free Speech*, 89 MINN. L. REV. 1407, 1413–14 (2005) (“[T]he trajectory of the First Amendment has been both to expand the scope of coverage and to deepen it, not to weaken coverage as it has steadily expanded. . . . Dilution is a theory trapped by a metaphor.”).

85. See Gregory P. Magarian, *The Marrow of Tradition: The Roberts Court and Categorical First Amendment Speech Exclusions*, 56 WM. & MARY L. REV. 1339, 1340 (2015) (“Free speech advocates’ conventional (not to say universal) view of this Court is adoring.”).

86. *City of Renton v. Playtime Theatres, Inc.*, 475 U.S. 41, 44 (1986). The term “adult motion picture theater” was defined as “[a]n enclosed building used for presenting motion picture films, video cassettes, cable television, or any other such visual media, distinguish[ed] or characteriz[ed] by an emphasis on matter depicting, describing or relating to ‘specified sexual activities’ or ‘specified anatomical areas’ . . . for observation by patrons therein.” *Id.*

87. *Id.*

ordinance in *Ward v. Rock Against Racism*, that do not refer to content at all. The *Renton* majority nevertheless characterized Renton's zoning ordinance as content-neutral because "the City Council's predominate concerns were with the secondary effects of adult theaters, and not with the content of adult films themselves."⁸⁸ These "secondary effects" had to do with crime, property values and "the quality of urban life."⁸⁹

It is easy to demonstrate the basic incoherence in the secondary effects approach. Most laws that discriminate on content can be shown to be *justified* by secondary effects rather than official distaste for the message itself; after all, they would have to be in order to satisfy the general requirement that content-discriminatory laws further a compelling governmental interest.⁹⁰ Carried to its logical conclusion, then, *Renton* would imply that strict scrutiny should apply only to laws motivated exclusively by disagreement with a particular message or subject. But those kinds of laws should fail a lower level of scrutiny anyway. Effectively, *Renton*'s logic would make strict scrutiny obsolete.⁹¹

This embarrassing defect makes it obvious the Court in *Renton* devised a kludge to cope with strains from an expansion in First Amendment coverage. Before *Roth v. United States*,⁹² governments regularly policed books and movies dealing frankly or provocatively with sex. *Roth* clarified that only a narrow category of erotic speech could be regulated without serious limitations.⁹³ In doing so, it expanded the range of First Amendment concern over a large territory of previously regulable, erotic expression. The implication was that materials dealing with sex would be placed on one of two tiers of protection. Obscenity as defined in *Miller v. California*,⁹⁴ *Roth*'s successor, would receive no protection, while sexually oriented materials just outside of the *Miller* zone would seem to receive the same

88. *Id.* at 47.

89. *Id.* at 48.

90. Consider, for instance, the case of "actual" child pornography. See *New York v. Ferber*, 458 U.S. 747 (1982). And "virtual" child pornography made without the involvement of actual children. See *Ashcroft v. ACLU*, 535 U.S. 234 (2002). The Supreme Court has correctly handled laws regulating both as content-discriminatory. Even though both express the most distasteful message imaginable, the Court has only upheld those laws that raise the most compelling *noncommunicative* concerns: namely, laws regulating actual child pornography as a means to combat child abuse.

91. See generally Geoffrey R. Stone, *Content-Neutral Restrictions*, 54 U. CHI. L. REV. 46, 115 (1987) (characterizing *Renton* as "a disturbing, incoherent, and unsettling precedent").

92. *Roth v. United States* 354 U.S. 476, 514 (1957).

93. *Id.*

94. *Miller v. California*, 413 U.S. 15 (1973).

total protection as works of high art and literature.

Such an all-or-nothing approach would have produced the politically unsalable outcome of total First Amendment protection for adult bookstores, strip clubs, and other venues of nearly obscene expression. Yet at the same time, the Court could not have been eager, after its long, humiliating public search in the 1950s, ‘60s, and early ‘70s for the *je ne sais quoi* of hardcore pornography, to develop some new intermediate category in this area. The secondary effects test therefore reads as an attempt to thread the needle, maintaining the strict two-tier framework in form while in substance establishing a politically responsive third track for “indecent” erotic expression.

The nominal adherence to the two-tier framework ensured *Renton*’s methods would eventually migrate toward core speech. Thus, in *Boos v. Barry*, the government relied on secondary effects to defend a Washington, D.C. ordinance that made it “unlawful, within 500 feet of a foreign embassy, either to display any sign that tends to bring the foreign government into ‘public odium’ or ‘public disrepute.’”⁹⁵ The government maintained that it had not been motivated by disapproval of any message, but rather by secondary effects related to “our international law obligation to shield diplomats from speech that offends their dignity.”⁹⁶

A majority of the Court declined to excuse this particular overreach under the secondary effects doctrine. But only two were willing to say that the secondary effects doctrine was generally inappropriate in cases involving political speech.⁹⁷ The other seven Justices, across two opinions, were unwilling to rule it out. Three Justices would have applied the secondary effects test to the ordinance considered in *Boos*.⁹⁸ The remaining three, led by Justice O’Connor, rejected the government’s secondary effects argument on the narrow ground that “[t]he emotive impact of speech on its audience is not a ‘secondary effect.’”⁹⁹ Justice O’Connor’s discussion suggests that other secondary effects arguments might have been better received: “They do not point to congestion, to interference with ingress or egress, to visual clutter, or to the need to protect the security of embassies.”¹⁰⁰ It is perhaps

95. *Boos v. Barry*, 485 U.S. 312 (1988).

96. *Id.* at 320.

97. *Id.* at 334–38 (Brennan, J., concurring in part and concurring in the judgment).

98. *Id.* at 338–39 (Rehnquist, J., concurring in part and dissenting in part).

99. *Id.* at 321.

100. *Id.* (“They do not point to congestion, to interference with ingress or egress, to visual clutter, or to the need to protect the security of embassies.”).

understandable that Justice O'Connor would decide the issue on the narrow ground that she did rather than simply acknowledge that *Renton* was an unprincipled exception designed especially for the sex industry. But the price of her decorum is that six out of eight voting Justices¹⁰¹ appear to take the position in *Boos* that the secondary effects doctrine may at times be applicable to cases involving core political speech.¹⁰²

The Supreme Court has since then been receptive, at least in the abortion context, to secondary effects arguments offered in support of laws regulating political speech.¹⁰³ In *Hill v. Colorado*, for instance, the Supreme Court treated as content-neutral a facially content-based law prohibiting “knowingly approach[ing] within eight feet of another person, without that person’s consent, for the purpose of passing a leaflet or handbill to, displaying a sign to, or engaging in oral protest, education, or counseling.”¹⁰⁴ Because the law was concerned with serious privacy interests rather than with expressing disapproval of the anti-abortion message, it was treated as content-neutral. In the 2014 case of *McCullen v. Coakley*, the Supreme Court cited *Renton*’s secondary effects analysis specifically to treat a similar law as content-neutral before ultimately striking it down.¹⁰⁵

In the lower courts, *Renton*’s influence reaches still further. In a 2011 opinion, a lower court classified as content-neutral a law requiring public officials to discuss public business only in open meetings: “[The Act] is content-neutral because the Act was designed to control the secondary effects of closed meetings.”¹⁰⁶ And as discussed above, the Second Circuit has relied on *Renton* and secondary effects in its treatment of a law criminalizing the distribution of source code designed to “crack” copy-protected media.¹⁰⁷

The point here is not to argue that erotic speech should not have been brought into the First Amendment fold, or to argue that the line for obscenity should have been drawn differently, or even to argue that the

101. Justice Kennedy abstained, but most likely would have joined Justices Brennan and Marshall in their skepticism of the secondary effects doctrine had he participated.

102. A position that the whole Court shortly reaffirmed in *Forsyth County v. Nationalist Movement*, 505 U.S. 123 (1992). Note that the Court rejected the secondary effects argument for the same reasons as in *Boos*. See generally David L. Hudson, Jr., *The Secondary Effects Doctrine: “The Evisceration of First Amendment Freedoms,”* 37 WASHBURN L.J. 55 (1997).

103. Hudson, *supra* note 102.

104. *Hill v. Colorado*, 530 U.S. 703, 707 (2000).

105. *McCullen v. Coakley*, 134 S. Ct. 2518, 2523 (2014).

106. *Asgeirsson v. Abbott*, 773 F. Supp. 2d 684, 698 (W.D. Tex. 2011), *aff’d*, 696 F.3d 454 (5th Cir. 2012).

107. *Corley*, 273 F.3d at 429; see also, *supra* notes 43–47 and accompanying text.

political secondary effects cases have produced bad outcomes—rather, it is only to demonstrate that the extension of the First Amendment’s scope into those areas has invited courts to water down the doctrine in ways that eventually diminish doctrinal clarity and strength across the board.

b. Dilution Illustration 2: The Public Forum

The public forum doctrine has its roots in *Hague v. CIO*, which knocked down a city’s absolute ban against labor meetings in public spaces.¹⁰⁸ In doing so, the Court rejected the theory of *Davis v. Massachusetts*, an 1897 case holding that the state could govern publicly owned properties clear of constitutional restraints.¹⁰⁹ The theory of *Davis*, borrowed from a lower court opinion by Oliver Wendell Holmes,¹¹⁰ was clear, and followed logically from a sensible, if highly formal, premise: namely, that a property owner may admit or bar whatever discussion they wish upon their own property. Government, *Davis* reasoned, was only one such property owner.

The obvious problem with the *Davis* argument is that it would subordinate the broader democratic mission of the First Amendment to a formal property-rights analysis. The *Hague* Court seized on this point, perceiving that the right to assembly could not thrive if publicly owned spaces were denied to protesters, picketers, and organizers. Even if the facts of the case arose on public property, the Constitution created something like an easement for speakers in the streets and parks.¹¹¹ *Hague* thus affirmatively committed the government to provide infrastructure for the exercise of practices closely associated with the democratic ideal of the First Amendment.

Hague’s voice is mostly gone from today’s public forum doctrine, which has greatly expanded in scope while mostly devolving into a generalized nondiscrimination framework that grants the government far greater discretion to suppress dissident speech on public property than it would have enjoyed under *Hague*.¹¹² As Ronald Krotoszynski has recently pointed out, no federal court today would allow the march on Selma—a four-day, fifty-two-mile march down an interstate

108. *Hague v. Comm. for Indus. Org.*, 307 U.S. 496 (1939).

109. *Davis v. Massachusetts*, 167 U.S. 43, 47 (1897).

110. *Commonwealth v. Davis*, 165 Mass. 510 (1895).

111. *Hague*, 307 U.S. at 515–16.

112. See generally John D. Inazu, *The First Amendment’s Public Forum*, 56 WM. & MARY L. REV. 1159, 1197 (2015).

highway—to proceed.¹¹³

The expansion of the public forum doctrine beyond *Hague*'s streets and parks began in cases such as *Southeastern Promotions v. Conrad*, in which the Court announced the possibility of “designated” public fora on other governmental properties.¹¹⁴ In that case, the promoters of the musical *Hair* had applied for the use of a municipally owned theater in Chattanooga, Tennessee. The municipal board denied Southeastern the permit for reasons relating to *Hair*'s reputation for nudity and scandal. The board explained that *Hair* was inconsistent with its “mission” to provide family entertainment to the local community. The Court took the case and held that the theater (or really, its calendar of events) operated as the equivalent of the traditional public fora described in *Hague*. Within this framework, the Court held that the city's exercise of editorial discretion operated as an unlawful prior restraint.¹¹⁵

Later assertions of public forum became even more tenuous, with aggrieved litigants frequently casting public subsidy programs as “metaphysical” public fora.¹¹⁶ The Court has come up with various techniques to dispose of these peripheral claims. Over time, they have migrated back to the core of the public forum doctrine. In *Cornelius v. NAACP*, for example, various legal services corporations fought an executive order excluding them from a charity drive in federal workplaces.¹¹⁷ The Court held that governmental intent governed the case. Though metaphysical fora were possible—that much had already been established¹¹⁸—the Court held that those fora only conferred strong protections when the government had *intended* to create a public forum. By opening the charity drive, the government had not intended to create a forum; therefore, there was not a forum.¹¹⁹

Five years later, this governmental intent rationale was applied to a

113. Ronald J. Krotoszynski Jr., Opinion, *Could a Selma-Like Protest Happen Today? Probably Not*, L.A. TIMES (Mar. 7, 2015, 5:00 AM), <http://www.latimes.com/opinion/op-ed/la-oe-0308-krotoszynski-selma-march-protest-doctrine-20150308-story.html#page=1>.

114. See *Se. Promotions v. Conrad*, 420 U.S. 546 (1975).

115. *Id.*

116. See *Perry Educ. Ass'n v. Perry Local Educators' Ass'n*, 460 U.S. 37 (1983); *Cornelius v. NAACP Legal Def. & Educ. Fund, Inc.*, 473 U.S. 788 (1985); *U.S. v. Kokinda*, 497 U.S. 720 (1990); *Rosenberger v. Rector*, 515 U.S. 819 (1995); *NEA v. Finley*, 524 U.S. 569 (1998); and *Walker v. Tex. Div., Sons of Confederate Veterans*, 135 S. Ct. 2239 (2015).

117. *Cornelius*, 473 U.S. at 795.

118. *Perry Educ. Ass'n*, 460 U.S. 37.

119. To be more precise, there was a “nonpublic forum.” *Cornelius*, 473 U.S. at 795. The terminology in this area is notoriously fickle. See Marc Rohr, *The Ongoing Mystery of the Limited Public Forum*, 33 VILL. L. REV. 299 (2009).

physical space of the sort that *Hague* would have called a forum. In *United States v. Kokinda*, members of a political advocacy group set up a table on the sidewalk in front of a U.S. Post Office and were arrested when they refused to leave.¹²⁰ A plurality of the Court upheld the conviction because “[t]he postal sidewalk was constructed solely to assist postal patrons to negotiate the space between the parking lot and the front door of the post office, not to facilitate the daily commerce and life of the neighborhood or city.”¹²¹

Justice Brennan noted in his dissent that a dilution had taken place:

Whatever the proper application of public forum doctrine to novel situations like fundraising drives in the federal workplace . . . we ought not unreflectively transfer principles of analysis developed in those specialized and difficult contexts to traditional forums such as streets, sidewalks, and parks. In doing so, the plurality dilutes the very core of the public forum doctrine.¹²²

Another doctrinal device, the “government speech” doctrine, offers a second means of dilution in the public forum. That doctrine broadly holds that the government may “speak” its own message and communicate its own values without triggering obligations to prop up competing speakers or messages.¹²³ It successfully deflected the ridiculous in *National Endowment for the Arts v. Finley*, for instance, in which the nudity-prone performance artist Karen Finley and others challenged a congressional enactment ordering the National Endowment for the Arts to take “decency” into account when making grants.¹²⁴ The government speech doctrine also provided an initially satisfying answer to *Pleasant Grove v. Summum*, in which a religious sect argued that a privately donated (and constitutionally slippery) shrine to the Ten Commandments on public property had established a “forum” of monuments to which any aspiring monument builder could lay a First Amendment claim.¹²⁵ The answer to each of these cases was simply that the government must be free at times to communicate certain messages to the public, whether by subsidizing some selected artwork or by accepting a monument, without opening up some sort of carnival.

The problem is that the argument has no limiting principle. At worst,

120. *Kokinda*, 497 U.S. 720.

121. *Id.* at 728. A fifth Justice, Justice Kennedy, would have upheld the conviction as a time-place-manner regulation without reaching the forum question. *Id.* at 737–39 (Kennedy, J., dissenting).

122. *Id.* at 746–48 (Brennan, J., dissenting) (internal footnote and citation omitted).

123. See generally *Pleasant Grove City v. Summum*, 555 U.S. 460, 467 (2009).

124. *Nat’l Endowment for the Arts v. Finley*, 524 U.S. 569, 572–73 (1998).

125. *Summum*, 555 U.S. at 464.

the government could adopt essentially any private message spoken in a public forum as its own “government speech,” and thereby acquire the right to suppress the private expression of any conflicting viewpoint in the same space. The 2015 case of *Walker v. Sons of Confederate Veterans*, which held that the State of Texas had the right to discriminate based on viewpoint in its issuance of personally customizable specialty license plates, expanded *Sumnum* past the context of monuments.¹²⁶ It has yet to be seen whether or to what extent the government speech doctrine will ultimately undermine the right to be free of viewpoint discrimination in *Hague*’s public forum of streets and parks.¹²⁷

II. THE DILUTION THREAT FROM EMERGING TECHNOLOGIES

When I argued in a 2014 law review article that 3D printing should not receive special First Amendment protections,¹²⁸ I worried that I might be seen as setting up and knocking down a straw-man argument that no licensed attorney would put in front of a court. The argument I challenged—that CAD files are *really* code, that code is *really* a sort of language, and that language is *really* speech—sounded like the sort of dorm-room epiphany that one learns not to take seriously at some point in their 1L year. It seemed to disregard any notion that the development of legal doctrines might reflect considerations of social policy, or that judges might consider the institutional position of the judiciary vis-a-vis the political branches, or that judges might strive to avoid finding weird hidden meanings in constitutional and other legal materials. It struck me as bare logic untempered by any lawyerly sense.¹²⁹

But that very argument is now in court, and it has not been challenged as frivolous—either by the government or by the various legal commentators who have spoken to the press.¹³⁰ It is far more

126. *Walker v. Tex. Div., Sons of Confederate Veterans*, 135 S. Ct. 2239 (2015).

127. See Erwin Chemerinsky, *A Dangerous Free Speech Ruling*, TRIAL, July 2009, at 60–61 (expressing concern that *Sumnum* would permit the government to suppress anti-war demonstrations on public property by adopting the message of pro-war demonstrators as its own).

128. Langvardt, *supra* note 28.

129. I suspect that many lawyers would have felt the same way if they had been confronted ten years ago with the word games that ultimately made it to the Supreme Court in *NFIB v. Sibelius*, 132 S. Ct. 2566 (2012) (concluding that Congress may “regulate” but not “create” commerce). See also *King v. Burwell*, 135 S. Ct. 2480 (2015) (explaining clear statutory drafting errors should be read strictly even at the expense of the national health care system).

130. See Alan Feuer, *Cody Wilson, Who Posted Gun Instructions Online, Sues State Department*, N.Y. TIMES (May 6, 2015), <http://www.nytimes.com/2015/05/07/us/cody-wilson-who-posted-gun-instructions-online-sues-state-department.html> (quoting renowned First Amendment attorney Floyd Abrams as saying, “on the face of it, it seems to me like a serious

grounded in tradition, as discussed above,¹³¹ than one might initially think. And its form is so general that it appears fully portable to virtually any technology that relies on the transmission of bits. The radical weirdness of the technologies that that description could sweep in over the next few decades, or even the next few years, should not be underestimated.

Analogies from the past can be unreliable where technological progress is concerned. Everyone knows that we have witnessed an explosion of information technology over the last two or three decades. But the rapid adoption of the Internet and of computing technologies in the 1990s and early twenty-first century do not, in First Amendment terms, offer a meaningful parallel to the kinds of technologies that we should expect to emerge over the next twenty years. This is because most of the “technology” cases so far simply present traditional speech issues in a newfangled context. *Brown v. Entertainment Merchants Ass’n*,¹³² for instance, is sometimes held out as a technology case for Justice Scalia’s extension of First Amendment coverage to video games, but it would have been far more surprising to see the Court hold that video games somehow would *not* receive similar protections to the movies they so closely resemble.

A technology such as 3D printing, on the other hand, really does promise to take the First Amendment someplace completely new, and to press it into a whole new type of service. And unlike its close predecessors in the cryptography field, it has the potential to set up the First Amendment as a stumbling block in the path of the state as it confronts a transforming economy.

It should also be remembered that the curve of technological progress tends to move exponentially. Moore’s Law, the observation that the amount of transistor density available per unit of cost doubles every eighteen months, is the most well-known example of the phenomenon.¹³³ But technology experts have argued that technological

claim”).

131. See *supra* notes 66–80.

132. *Brown v. Entm’t Merchs. Ass’n*, 131 S. Ct. 2729 (2011).

133. Steve Jurvetson, *Transcending Moore’s Law with Molecular Electronics and Nanotechnology*, 1 NANOTECHNOLOGY L. & BUS. 70, 71 (2004) (“Moore’s Law is commonly reported as a doubling of transistor density every 18 months. But this is not something the co-founder of Intel, Gordon Moore, has ever said. It is a nice blending of his two predictions; in 1965, he predicted an annual doubling of transistor counts in the most cost-effective chip and revised it in 1975 to every 24 months. With a little hand waving, most reports attribute 18 months to Moore’s Law, but there is quite a bit of variability. The popular perception of Moore’s Law is that computer chips are compounding in their complexity at near constant per unit cost.”).

advancement conceived more broadly follows a similar curve¹³⁴—for instance, the relationship between the year of a technology’s invention and the year it was adopted by one quarter of the American population.¹³⁵ At the very least, we should not expect the pace of technological disruption to proceed at the same pace that it has in the Internet’s first decades. Nor, by extension, should we expect the next twenty years of the First Amendment’s development to be as tranquil as the last twenty years.

A. *Some New Information Technologies*

In this Section, I will discuss three nascent technologies that, according to the information rule, raise their own oddball First Amendment stakes. I do not intend for this to be an exhaustive list.

1. 3D Printing

3D printing is an umbrella term used to refer to various manufacturing techniques that allow three-dimensional tangible objects to be produced from digital models known as CAD files.¹³⁶ The most common 3D printers today produce objects by extruding molten plastic into two-dimensional layers and then by simply stacking layer upon layer until the job is done.¹³⁷ These are the cheapest ones. Desktop versions go for as low as a few hundred dollars.¹³⁸ But there are other variations on the concept that produce higher-quality objects in less time.¹³⁹

The common advantage of these technologies is that they eliminate

134. See generally RAY KURZWEIL, *THE SINGULARITY IS NEAR: WHEN HUMANS TRANSCEND BIOLOGY* 50 (2005).

135. *Id.*

136. THOMAS CAMPBELL ET AL., *ATL. COUNCIL, COULD 3D PRINTING CHANGE THE WORLD? TECHNOLOGIES, POTENTIAL, AND IMPLICATIONS OF ADDITIVE MANUFACTURING I* (2011), <http://3dprintingindustry.com/wp-content/uploads/2013/05/Atlantis-Report-on-3D-printing.pdf>.

137. Lee Hutchinson, *Home 3D Printers Take Us on a Maddening Journey into Another Dimension*, ARSTECHNICA (Aug. 27, 2013, 6:00 PM), <http://arstechnica.com/gadgets/2013/08/home-3d-printers-take-us-on-a-maddening-journey-into-another-dimension/>.

138. Dong Ngo, *3D Printing in Brief: A Few Printers For Your Consideration*, CNET (April 24, 2015), <http://www.cnet.com/news/3d-printing-in-brief-here-are-a-few-printers-for-your-consideration/>.

139. XYZPrinting’s Nobel 1.0, for instance, produces much higher quality objects through a stereolithography process in which lasers trace and harden the surface of the object in a pool of photosensitive liquid resin. It retails for \$1500. Lucas Mearian, *Review: The Nobel 1.0—Stereolithographic 3D Printing On the Cheap*, COMPUTERWORLD (July 21, 2015, 3:11 AM), <http://www.computerworld.com/article/2934876/3d-printing/review-stereolithography-3d-printing-on-the-cheap-the-nobel-10-is-slow-but-pretty-accurate.html>.

most of the costs involved with retooling. As an example, consider the manufacturing process behind a mass-produced electric guitar. Almost all electric guitars have asymmetrical bodies, which means that right-handed and left-handed guitars must be cut using different templates and differently configured routers and sanders. Left-handed guitars comprise too small a market share to justify devoting a facility entirely to their production, so in order to meet what small demand there is, the firm must at some point every year retool the entire facility for a two-week run of left-handed guitars. The result is that the average cost of a guitar produced in the left-handed run is significantly higher than the average cost of a guitar produced in the right-handed run.¹⁴⁰ Quality seems to suffer as well. An online rumor claims that the Fender Musical Instrument Company schedules this run to coincide with its most skilled luthiers’ vacations.¹⁴¹ If guitar bodies and necks were 3D printed, these differences would largely disappear.

The effect would be more dramatic than that, though. Some experimental 3D-printed guitars already do exist,¹⁴² and many of them were not printed in shops that specialize in musical instruments. Instead, they have been printed in general purpose 3D-print shops that print whatever CAD the customer sends to them.¹⁴³ For smaller objects, a print shop would be unnecessary. Instead, the user could print the item at home on a reasonably affordable desktop device.

A second advantage is the potential to remove skill almost completely from the equation of production. Today, 3D printing is mostly for hobbyists, as the process is error prone and leaves a good deal of finishing and assembly work to do. But later generations of the currently available technologies are sure to iron the kinks out and to allow production at a higher speed. Once a certain threshold of convenience is crossed, it becomes easy to imagine an iPod-like event in which the technology becomes almost universally adopted in a matter

140. *Why Aren't All Guitars Available Left Handed?*, LEFTYFRETZ, <http://leftyfretz.com/cost-versus-demand-lefty-guitars-and-the-production-line/> (last visited Mar. 9, 2016).

141. Ardiril, Comment to *Are You Sinister—or Dextrous?*, TONEFIEND ARCHIVES (July 11, 2012, 6:04 AM), <http://www.seymourduncan.com/tonEFIEND/guitar/are-your-sinister-or-dextrous/>.

142. With some significant qualifications. The neck, bridge, tuners, strings, and electronics are all conventional. The neck attaches to a small block of tonewood which is then fit into a 3D-printed plastic body. Paul Ridden, *Customuse 3D Prints Affordable “Custom Shop” Guitars*, GIZMAG (Aug. 20, 2014), <http://www.gizmag.com/customuse-3d-printed-guitars/33438/>. Wood and metal-based 3D-printing filaments have hit the market this year, though, raising the possibility that the rest of the guitar may someday be 3D printed as well.

143. Ashlee Vance, *The World's First 3D-Printed Acoustic Guitar*, BLOOMBERG BUS. (Oct. 12, 2012), <http://www.bloomberg.com/bw/articles/2012-10-11/the-worlds-first-3d-printed-guitar>.

of a couple of years.

As I described in more detail in an earlier article,¹⁴⁴ these changes will eventually push regulators to police the distribution of information rather than the distribution of goods. This is for two reasons.

First, removing specialized tools and workers from the equation leaves only two desiderata for producers: materials and blueprints. Policing a given item on the *manufacturing* side will have to mean policing the distribution of the blueprints rather than the materials unless the item being policed incorporates some material with only a narrow use (e.g., nuclear weapons and enriched uranium).

Second, the elimination of specialized tools and workers as a necessity alters the cost structure of manufacturing in a way that will distribute the manufacturing process over too many locations to police at the point of sale. The chain of commerce today is reasonably easy to trace for most goods largely because there are only a relative few producers. The producers are few because every good has a minimum efficient scale of production. This minimum efficient scale is a function of the same fixed costs that 3D printing promises to eliminate. If the minimum efficient scale for a given good is reduced to a single item, (for a present-day example, imagine that you needed twelve ice cubes) then a consumer will do better to produce it at home than to procure it somewhere else. Once an item is produced in millions of home factories rather than a handful of industrial-scale factories, it cannot be policed except at a forbiddingly high cost.

As 3D-printing technologies pick up, then, the government will face mounting pressure to regulate the distribution of the CAD files on the Internet. Doing so effectively may be impossible, as the battles over illegal file sharing suggest, but it still appears relatively feasible when compared with the alternative of traditional policing.¹⁴⁵

144. See Langvardt, *supra* note 28, at 102–05.

145. I discuss two more alternatives in *The Replicator and the First Amendment*, and express skepticism that they are viable or adequate to the task. *Id.* at 105–10. The first is a digital rights management, or “DRM,” model similar to the one that the media companies tried and eventually scuttled during the first decade of the twenty-first century. These measures attempted to make illicit uses of intellectual property impossible by introducing technological barriers into media players and storage media. But they imposed unforeseen and sometimes disastrous costs on all parties, and they were at any rate easily circumvented. See Ke Steven Wan, *Managing Peer-to-Peer Traffic with Digital Fingerprinting and Digital Watermarking*, 41 SW. L. REV. 331, 364 (2012) (“No DRM . . . has been robust enough to survive circumvention and enabled copyright owners to effectively prevent copyright infringement.”). A second type of measure—namely, a sponsored registry of “safe” or “authorized” designs—would be useful in certain applications, for instance consumer safety, where the end-user has incentives to comply voluntarily. But such measures have obvious limits.

2. Synthetic Biology

Advances in synthetic biology raise many of the same issues as 3D printing, but somewhat further off in the future. Unlike “traditional” methods of genetic modification that involve the implantation of genetic material extracted from preexisting sources, synthetic biology prints from scratch new genetic material that has been coded using a computer.¹⁴⁶

Today, for instance, a firm called 20n holds proprietary software capable of taking as an input a desired organic compound and producing as an output the genome for a bacterium that will produce that compound.¹⁴⁷ 20n first demonstrated its capabilities by designing a synthetic bacterium that excretes Tylenol.¹⁴⁸ At another firm, synthetically modified yeasts are used to produce vanillin without using vanilla beans.¹⁴⁹ Malaria drugs are made from spliced *E. coli*.¹⁵⁰ Scientists recently reported that modified yeasts could be used to produce various types of narcotics,¹⁵¹ prompting concerns over a new black market for “homebrew” morphine.¹⁵²

Such manipulations still require a high degree of skill and specialization, but the up-front investment required to build a laboratory is surprisingly low. *Wired* recently quoted Hank Greely, a bioethicist at Stanford, saying that

[g]enome editing started with just a few big labs putting in lots of effort, trying something 1,000 times for one or two successes Now it’s something that someone with a BS and a couple thousand

146. Helen Thompson, *Scientists Build a Yeast Chromosome From Scratch. Next Up? Designer Genomes*, SMITHSONIAN (Mar. 27, 2014), <http://www.smithsonianmag.com/science-nature/scientists-build-yeast-chromosome-scratch-next-up-designer-genomes-180950281/?no-ist>.

147. 20N, <http://20n.com/> (last visited Mar. 9, 2016).

148. Kim-Mai Cutler, *20n, A YC Synthetic Biology Startup, Uses Software To Engineer Microbes For Chemical-Making*, TECHCRUNCH (Feb. 26, 2015), <http://techcrunch.com/2015/02/26/20n/#.kd6jwf:WC6j>.

149. Eric McEachran, *Creators Defend Vanilla Flavour Made Using Synthetic Biology* GUARDIAN (May 28, 2015), <http://www.theguardian.com/sustainable-business/2015/may/28/creators-defend-vanilla-flavour-made-using-synthetic-biology>.

150. Roger Highfield, *Malaria Drug to be Made from ‘Synthetic Biology’ Organism*, TELEGRAPH (June 3, 2008, 5:00 PM), <http://www.telegraph.co.uk/science/science-news/3343421/Malaria-drug-to-be-made-from-synthetic-biology-organism.html>.

151. William C DeLoache et al., *An Enzyme-Coupled Biosensor Enables (S)-Reticuline Production in Yeast from Glucose*, 11 NATURE: CHEMICAL BIOLOGY 465 (May 18, 2015); Donald G. McNeil, Jr., *A Way to Brew Morphine Raises Concerns Over Regulation*, N.Y. TIMES (May 18, 2015), http://www.nytimes.com/2015/05/19/health/a-way-to-brew-morphine-raises-concerns-over-regulation.html?_r=1.

152. McNeil, *supra* note 151; Thompson, *supra* note 146.

dollars' worth of equipment can do. What was impractical is now almost everyday.¹⁵³

Forbes reported that the decline in cost for DNA sequencers has in its short history far outpaced Moore's Law.¹⁵⁴

Synthetic biology techniques appear to be undergoing the same process of informatization witnessed in the 3D-printing field. As institutional and material barriers to entry are loosened, governments who would regulate the production and dissemination of goods or the availability of medical procedures that depend on these processes will face similar pressures to regulate the online distribution of information in order to do so.

3. Cryptocurrencies

Bitcoin, the most successful of hundreds of similar digital currencies, is a peer-to-peer system of exchange used both as a currency and as a vehicle for speculation. Bitcoin first reached parity with the dollar in February 2011; at the time of this writing, a bitcoin, or BTC, was worth \$415.18¹⁵⁵ and tens of millions of dollars' worth in bitcoin are transacted every day.¹⁵⁶ The exchange rate is highly volatile; at the peak of a bubble in 2013, a single BTC traded for over \$1000.¹⁵⁷

Much of the mainstream news coverage of bitcoin has centered on its role in the "dark web" drug market Silk Road and the lurid courtroom drama surrounding its administrator Ross William Ulbricht, also known as Dread Pirate Roberts.¹⁵⁸ But most bitcoin is exchanged in more mundane markets, with websites such as Overstock.com and OkCupid.com signing on in recent years.

The feature that distinguishes cryptocurrencies such as bitcoin from more traditional currencies such as the dollar is that they do not depend

153. Amy Maxmen, *The Genesis Engine*, WIRED, <http://www.wired.com/2015/07/crispr-dna-editing-2/> (last visited Mar. 9, 2016).

154. Adrienne Burke, *DNA Sequencing Is Now Improving Faster Than Moore's Law!*, FORBES (Jan. 12, 2012, 1:07 PM), <http://www.forbes.com/sites/teconomy/2012/01/12/dna-sequencing-is-now-improving-faster-than-moores-law/#51677c4f59bf>.

155. *Bitcoin Price Index Chart*, COINDESK, <http://www.coindesk.com/price> (last visited Mar. 9, 2016).

156. *Estimated USD Transaction Volume*, BLOCKCHAIN, https://blockchain.info/charts/estimated-transaction-volume-usd?timespan=30days&showDataPoints=false&daysAverageString=1&show_header=true&scale=0&address= (last visited Mar. 9, 2016).

157. *The Bitcoin Bubble*, ECONOMIST (Nov. 13, 2013), <http://www.economist.com/news/lead-ers/21590901-it-looks-overvalued-even-if-digital-currency-crashes-others-will-follow-bitcoin>.

158. Andy Greenberg, *Feds Allege Silk Road's Boss Paid For Murders of Both a Witness and a Blackmailer*, FORBES (Oct. 2, 2013, 7:52 PM), <http://www.forbes.com/sites/andygreenberg/2013/10/02/feds-allege-silk-roads-boss-paid-for-murders-of-both-a-witness-and-a-blackmailer/>.

on any physical backstop to control the supply and the value of money. The most primitive systems of value took the form of gold or shells or some other pretty object that was intrinsically tradable because it was pretty. The earliest currency systems pounded the pretty metal into a coin of standardized weight. Later-developed paper currency systems took the form of banknotes, or bills, that gave the bearer the option to buy a fixed amount of pretty metal from the government. Finally, “fiat” currencies abandoned the pretty metal conceit altogether so that a central bank such as the Federal Reserve could “float” the value of the currency by manipulating the total amount of money available in the economy. But even these relatively abstract systems rely on physical limitations: if it is too easy to produce counterfeit cash, then the value of the currency becomes insecure.

The initial problem in setting up a digital currency, then, is known as the “double-spending” problem: namely, that it should at first impression be trivially easy to counterfeit multiple exact copies of the same unit of currency and spend it multiple times. Bitcoin and its peers get around this problem through the use of cryptography and a universal transactions ledger called the “blockchain.”

What follows is a simplified account of the blockchain’s operation. If A wants to send one bitcoin to B, then A and B must collaborate to record the transaction on the blockchain. A begins the transaction by signing off on the transfer publicly. Asymmetric-key cryptography ensures that A’s signature—and everyone’s on the network—cannot be forged. B then signs to verify receipt of the bitcoin.¹⁵⁹

A traditional bank ledger keeps a record of each account-holder’s funds. In bitcoin, by contrast, there are no “accounts.” Instead, the system keeps track of “inputs” and “outputs.” If A wants to send one bitcoin to B, then, the blockchain records that A has “input” a string of characters representing that one bitcoin. A is the only party in the world who possesses the private key that allows this input to be made. Once the blockchain records that this particular character stream has been input, it can never be input again. In other words, the double-spending problem is avoided because a bitcoin can only be spent once before it is destroyed and replaced. B is now free to generate a new, similarly encrypted character stream—a “new bitcoin”—and record it publicly to the blockchain as “output” from the same transaction. Every transaction

159. François R. Velde, *Bitcoin: A Primer*, CHI. FED LETTER, No. 317 (Fed. Reserve Bank of Chi., Chicago, Ill.), Dec. 2013, <https://www.chicagofed.org/publications/chicago-fed-letter/2013/december-317>.

in the history of bitcoin is recorded in this manner to the blockchain, and bitcoin or fraction thereof can be traced back, transaction by transaction, to the origin. Every bitcoin user possesses a copy of the blockchain and depends on it to verify that they are not accepting bitcoins that have already been spent.¹⁶⁰

The trick, then, is to make sure that no one is in a position to falsify the blockchain. Bitcoin's solution is ingenious. The blockchain consists of "blocks," each of which represents about ten minutes of transactions in the bitcoin economy. Scores of computers at any given time—"miners" in bitcoin jargon—compete to produce the next block. As bitcoin users make transactions, they broadcast the records of those transactions to surrounding nodes in the network, and within a brief period of time, those records have reached both users. Miners take in these new transactions and add them to the blocks that they are attempting to compile. In order for any given miner's block to become the next block in the blockchain, that miner must successfully solve a math problem so difficult that the quickest path to a solution is a series of random guesses. Roughly every ten minutes, a miner somewhere in the world guesses the solution to one of these problems. That miner's block is now recognized as the next in the blockchain, and the new block notes that the miner has been rewarded with a newly minted bitcoin as well as with the sum of the last few minutes of transaction fees across the network. The point of this worldwide contest is to ensure that any one person's odds of successfully creating and manipulating a new block for purposes of double-spending are equal to their trivially low chance of winning.¹⁶¹

The most immediate regulatory concerns associated with bitcoin arise from the fact that bitcoin transactions, especially when used in conjunction with anonymizing software such as Dark Wallet, are difficult to trace back to their participants.¹⁶² They are also impossible

160. *Id.*

161. *Id.*

162. "Vanilla" bitcoin's anonymity is arguably illusory. On the one hand, the blockchain keeps no record of who *holds* a bitcoin, but on the other, it keeps a flawless record of the movements of individual bitcoins. It is not unlikely that some sort of triangulation could effectively de-anonymize those transactions. New anonymizing software attempts to make this much more difficult. The Dark Wallet bitcoin client, for instance, launders the spending side of transactions by combining them on a random basis through its "coinjoin" feature. It launders the receiving side through the use of a "stealth address."

When another Dark Wallet user sends payment to that address, Dark Wallet is programmed to instead send the coins to another address that represents a random encryption of the stealth address. The recipient's Dark Wallet client then scans the

to freeze. Thus, the most sensational stories about bitcoin involve its use as a medium for exchange on the black market: there is the story of the Silk Road, a fully realized eBay for drugs and weapons with its reportedly amazing customer service¹⁶³ and annual sales volume of hundreds of millions of dollars;¹⁶⁴ of the Assassination Market, a fledgling attempt to crowdfund political hits;¹⁶⁵ and of the Islamic State spokesman who has encouraged donors to use Dark Wallet to launder donations.¹⁶⁶ And as a related concern, highly anonymized digital currencies seem to be a perfect fit for tax evasion.¹⁶⁷

The New York State Department of Financial Services has reacted—almost certainly overreacted—to these concerns with its “BitLicense” regulatory framework, which requires firms that transact bitcoin in New York to hold a license and, among other things, keep on file for seven years personal identifying information for every party to every transaction.¹⁶⁸

There are other features that might invite regulation further down the road. The first is the bitcoin system’s hard-wired deflationary monetary policy. The only way that new bitcoins can be minted is through the system of rewards issued to bitcoin miners who “strike gold” (see *supra*), and the bitcoin software cuts the volume of those rewards in half every four years. In the beginning, a successful bitcoin miner would reap a reward of 50BTC; today, the reward is at 25BTC and falling. Over time the premium will peter out to 0.00000001BTC, and then,

blockchain for any address it can decrypt with the user’s secret key, finds the stealth payment, and claims it for the user.

See Andy Greenberg, “Dark Wallet” is About to Make Bitcoin Money Laundering Easier than Ever, WIRED (Apr. 29, 2014, 6:11 PM), <http://www.wired.com/2014/04/dark-wallet/>.

163. See, e.g., Joshua Kopstein, *How the Ebay of Illegal Drugs Came Undone*, NEW YORKER (Oct. 3, 2013), <http://www.newyorker.com/tech/elements/how-the-ebay-of-illegal-drugs-came-undone>; Joshua Bearman & Tomer Hanuka, *The Rise and Fall of Silk Road*, WIRED, <http://www.wired.com/2015/04/silk-road-1/> (last visited Mar. 9, 2016).

164. United States v. Ulbricht, No. 14-CR-68 KBF, 2014 WL 5090039, at *1 (S.D.N.Y. Oct. 10, 2014).

165. Andy Greenberg, *Meet the ‘Assassination Market’ Creator Who’s Crowdfunding Murder With Bitcoins*, FORBES (Nov. 18, 2013, 8:30 AM), www.forbes.com/sites/andygreenberg/2013/11/18/meet-the-assassination-market-creator-whos-crowdfunding-murder-with-bitcoins/.

166. Rob Wile, *Supporter of Extremist Group ISIS Explains How Bitcoin Could Be Used To Fund Jihad*, BUS. INSIDER (July 8, 2014, 8:33 AM), <http://www.businessinsider.com/isis-supporter-outlines-how-to-support-terror-group-with-bitcoin-2014-7>.

167. There are more innocuous benefits to Bitcoin as well, such as low transaction costs, which enable some retailers such as Overstock.com to sell products at significant discounts. They also make bitcoin convenient for payment systems that might run on micropayments.

168. Regulation of the Conduct of Virtual Currency Businesses, 23 N.Y. COMP. CODES R. & REGS. tit. 23, §§ 200.1–200.22 (2015), www.dfs.ny.gov/legal/regulations/adoptions/dfsp200t.pdf.

around the year 2140, the slow drip of new money will stop altogether. Add it up and the total amount of bitcoin in circulation will never exceed 21 million BTC. What is more, bitcoin are permanently lost to the system whenever a bitcoin's owner forgets their key. The total amount of bitcoin will therefore begin to *decline* every year well before 2140. With its locked-in deflation and its capacity to facilitate tax evasion, bitcoin or a similar currency could eventually undercut the government's control over both the fiscal and the monetary dimensions of macroeconomic policy.¹⁶⁹

Perhaps the strangest respect in which bitcoin might draw regulators' attention is in its atrocious carbon footprint. Recall that the integrity of the blockchain, and thus the integrity of all bitcoin transactions, depends on the constant participation of huge numbers of computers in the bitcoin mining process. In the early days of bitcoin, it was possible to mine with a reasonable chance of profit from a personal computer. Today, the race to mine bitcoin is so competitive that one must invest several thousand dollars in a specialized high-powered mining "rig" with a processing power exceeding a personal computer's by a hundred times or more. Bitcoin mining was, as of December 2013, estimated to be tied to 0.03% of the world's total greenhouse gas output, and the power usage is expected to scale with the BTC/dollar exchange rate. The deflationary dynamic, in other words, ensures that as bitcoin acquires more and more adopters, the carbon footprint will increase proportionally.¹⁷⁰ If bitcoin ever achieved mainstream adoption, the environmental and macroeconomic consequences would ultimately become too much to bear.

As with 3D printing and synthetic biology, the application of the information rule to bitcoin is extremely straightforward: the system runs on code, code is information, and information is speech. As in the other contexts, the argument is so excessively formal and so undertheorized that it comes across as unserious. Yet that argument has already been made by serious, reputable attorneys at the Electronic Frontier Foundation ("EFF"). In 2014, as an early proposal for New York's BitLicense framework was in its notice-and-comment period, the EFF gave substantial space to an argument that the licensing scheme, along with its other faults, would amount to a prior restraint against speech:

169. Velde, *supra* note 159.

170. Michael Carney, *Bitcoin Has a Dark Side: Its Carbon Footprint*, PANDO (Dec. 16, 2013), <https://pando.com/2013/12/16/bitcoin-has-a-dark-side-its-carbon-footprint/>.

While digital currencies are most commonly thought of as means of payment, at their very essence, digital currency protocols are code. And as courts have long recognized, code is speech protected by the First Amendment. . . . Thus, government action triggers First Amendment protections when it regulates computer programs such as digital currency protocols—a fact that is especially true given the open source nature of these programs, which allows users to view, share, and develop ideas based upon the code itself. . . . Any scheme that seeks to license speech raises the specter of a prior restraint. The BitLicense proposal is no different. The regulation has “a close enough nexus to expression, or to conduct commonly associated with expression, to pose a real and substantial threat of . . . censorship risks.”¹⁷¹

It is similarly easy to imagine the shape of an attack against a regulatory scheme that did not involve licensing. A special tax against bitcoin transactions, for instance, would trigger intermediate scrutiny as a content-neutral regulation. If the tax applied exclusively to certain types of bitcoin transactions, or if it discriminated against bitcoin, for instance, and in favor of a more environmentally-friendly cryptocurrency, then the party raising the First Amendment challenge would no doubt call for strict scrutiny of a content-based restriction.

B. Hypothetical: A First Amendment Tech Bubble

In Part I, I suggested that the information rule, in the “strong form” we see today, should be considered as an extreme product of two converging trends in First Amendment law: first, the preference, over time, for eclectic readings of the Free Speech Clause, and second, the preference, over time, for formal readings of Free Speech Clause precedent. Whether or not I am correct about the cause, it nonetheless appears that the ontological-coverage functions such as the information rule run deep, and that they would be difficult to quit.

It therefore seems probable, at least in the early years, that courts will go through the motions of a First Amendment analysis as they confront the new code cases. I expect that at the beginning we may see a few

171. Comments from Marcia Hoffman, Special Counsel, Elec. Frontier Found., to New York Department of Financial Services on BitLicense, the Proposed Virtual Currency Regulatory Framework, 12–13, 16 (Oct. 21, 2014) (quoting *City of Lakewood v. Plain Dealer Publ’g Co.*, 486 U.S. 750, 759 (1988)), <https://www.eff.org/document/bitlicense-comments-eff-internet-archive-and-reddit>; see also Rainey Reitman, Electronic Frontier Foundation, *EFF, Internet Archive, and reddit Oppose New York’s BitLicense Proposal* (Oct. 21, 2014), <https://www.eff.org/press/releases/eff-internet-archive-and-reddit-oppose-new-yorks-bitlicense-proposal>.

early opinions that extend some limited First Amendment shelter to certain practices, but that those victories, if there are any, will taper off as it becomes clear to judges that they are dealing with something larger than the regulation of a cottage industry. The results if not the reasoning of these cases will quickly realign with the traditional rational-basis treatment of economic regulations since the New Deal. The twist will be that the opinions in those cases will describe the government as having passed once-meaningful but now diluted hurdles such as strict scrutiny.

Consider, then, the following hypothetical. Suppose that sometime between now and 2025, a firm releases an affordable and user-friendly 3D printer that is capable of printing small, decent-quality consumer goods from a small assortment of materials such as plastic, wood fiber, latex, and aluminum. This is a modest assumption, as it requires only moderate improvement upon products that already exist today: desktop 3D printers capable of printing from those materials are available for a few hundred dollars retail today, but they require some attention and their output is prone to rough edges.¹⁷² To make a rough analogy, one could say that consumer 3D printers in 2016 are situated similarly to consumer MP3 players in 1998 or 1999, two or three years before the debut of the iPod in 2001.¹⁷³

From here, this new 3D printer becomes the iPod of 3D printing. Like the iPod, it becomes a household item in less than a decade.¹⁷⁴ And like downloadable music, 3D printing becomes a disruptive technology. Most consumers seeking small, simple items—small tools, cheap jewelry, toys, and so on—now turn to the Internet rather than to retail. They search for what they want, download (or stream) the file, and print the object at home. Some of these consumers might look to relatively official pay-to-download services similar to iTunes. But

172. See Ngo, *supra* note 138 (“If you think about making something you can buy, getting a 3D printer makes no sense at all, financially or practically. For example you can drive to the store and buy an iPhone case for just a fraction of the printer’s cost (not to mention the cost of filament) and in even less time than it takes to print one yourself. Furthermore, a 3D-printed case is generally not as good as one that you can get from the store.”).

173. Matt Kleinschmit, *Portable MP3 Player Ownership Reaches New High*, IPSOS INSIGHT (June 29, 2006), <https://www.ipsos-na.com/news-polls/pressrelease.aspx?id=3124>.

174. Twenty percent of Americans over twelve owned portable mp3 players by June 2006, five years after the iPod’s release. *Id.* By 2009, the number had peaked at 45%, which is roughly where it has hovered. *Percentage of Adults in the United States Who Owned an MP3 Player Between April 2006 and January 2013*, STATISTA, <http://www.statista.com/statistics/256770/percentage-of-us-adults-who-own-a-mp3-player/> (last visited Mar. 9, 2016). As of October 2014, 64% of American adults own a smartphone. Aaron Smith, *U.S. Smartphone Use in 2015*, PEW RES. CTR. (Apr. 1, 2015), <http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015>.

hobbyists also post their own designs for various goods for free, and many consumers—especially children and teenagers—will find what they want in that way. Traditional retail markets for these goods, like the retail market for CDs in the early 2000s, largely collapse.¹⁷⁵

Something goes wrong with one of the many thousands of available products at some point—a doll presents a choking hazard, for example—and the government attempts to regulate it. Traditionally, this might mean that the Consumer Product Safety Commission (“CPSC”) would send a “letter of advice” to the firms responsible for manufacturing and selling the product. After an informal hearing, the CPSC might order that firm to stop selling the doll and initiate a recall.¹⁷⁶ But this manufacturer-oriented approach to a recall cannot work in an environment where consumers do the manufacturing. If it is to regulate 3D-printed goods, it must instead police the circulation of the relevant files on the Internet.

There is no other way to go about it. This is because the policing strategy in a traditional manufacturing environment monitors and polices a few large, heavily invested owners of “choke points” such as factories and warehouses. 3D printing, on the other hand, eliminates the need for those facilities.¹⁷⁷ The only choke points in the chain of production for a 3D-printed product, including the doll, therefore lie on the Internet: search engines, primarily, and secondarily, the sites that post the regulated or banned files.

Assume, then, that the government pursues the same strategy that the entertainment industry has pursued against media and software piracy for years under the DMCA. It issues cease-and-desist letters to the administrators of the major search engines and websites that link to the offending data—the same approach, recall, that the State Department took in 2014 against Defense Distributed, an organization that posted

175. Suppose a small luxury market for hand-hewn goods survives, just as a luxury market for vinyl records has survived the collapse of the record business.

176. See U.S. CONSUMER PROD. SAFETY COMM’N, THE REGULATED PRODUCT HANDBOOK (May 6, 2013), <http://www.cpsc.gov/Global/Business-and-Manufacturing/Business-Education/RegulatedProductsHandbook.pdf>; see also 16 U.S.C. § 1501 (2012) (toys presenting choking hazards).

177. See Edward Burke, et al., *Panel III: Implications of Enforcing the Digital Millennium Copyright Act: A Case Study, Focusing on United States v. Sklyarov*, 12 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 805, 846 (2002) (“MR. LEHMAN: The problem here is that the person who is actually making the unauthorized copy when something is sent out on the Internet en masse is actually the end-user. I think one of the things about the Copyright Law is it can never work successfully if you are going to go after each individual end-user. That is why, as I said in my earlier remarks, historically you went after the choke points, you went after the people who had the factory that produced the illegal copies.”).

files for a 3D-printable gun on its own site.¹⁷⁸

Alternatively, assume that the government uses technological controls to make the offending designs impossible for all but the most sophisticated Internet users to obtain. Americans tend to assume that these methods are impossible; as the old saying goes, “the Internet interprets censorship as damage and routes around it.”¹⁷⁹ But the Chinese government has shown with its “great firewall” that the availability of data on the Internet can be controlled with great precision. As Jack Goldsmith and Tim Wu detail in their book entitled *Who Controls the Internet?*,¹⁸⁰ Chinese users who search for blacklisted terms find no results, and those who make politically or culturally sensitive posts to message boards find that their remarks are gone within a minute.¹⁸¹ The Chinese state, of course, uses its great firewall to achieve results we abhor. But it seems reasonable to suppose that governments in liberal democracies will eventually use the same techniques to restrict the flow of non-expressive code such as recalled 3D-printable products.

Under the case law as of early 2016, the brief for the site administrators at this point writes itself.¹⁸² Information is speech, as the Supreme Court has said;¹⁸³ computer code, in particular, is speech, as the lower courts have well established.¹⁸⁴ By policing the availability of code, therefore, the recall order regulates speech. What is more, it applies by selectively restricting some files but not others, thereby discriminating on the basis of their content. Because the recall order discriminates based on content, it must be reviewed under strict

178. See Langvardt, *supra* note 28, at 80–83 (2014); see also Katie Fleschner McMullen, *Worlds Collide When 3d Printers Reach the Public: Modeling A Digital Gun Control Law After the Digital Millennium Copyright Act*, 2014 MICH. ST. L. REV. 187, 188 (recommending the same approach).

179. The software engineer John Gilmore is said to have coined this saying. See Peter H. Lewis, *Limiting A Medium Without Boundaries: How Do You Let the Good Fish Through the Net While Blocking the Bad?*, N.Y. TIMES (Jan. 15, 1996), <http://www.nytimes.com/1996/01/15/business/limiting-medium-without-boundaries-you-let-good-fish-through-net-while-blocking.htm?pagewanted=all>.

180. JACK GOLDSMITH & TIM WU, *WHO CONTROLS THE INTERNET?* (Oxford Univ. Press, 2008).

181. *Id.*

182. Indeed, these arguments have already been developed in a real-life test case much like the one that I describe. *Defense Distributed v. U.S. Department of State*, which is now in the pleadings stage before the U.S. District Court for the Western District of Texas, deals with the State Department’s attempt to suppress the availability of 3D-printed weaponry.

183. *Sorrell v. IMS Health Inc.*, 131 S. Ct. 2653, 2667 (2011).

184. See *supra* Part I.A.

scrutiny. Even if the recall order is taken as content-neutral, the recall order must be reviewed under intermediate scrutiny rather than the tepid rationality review that commercial regulations normally receive.¹⁸⁵ And if the law requires any kind of preclearance, or if the great firewall is imposed in such a way as to make the recalled doll unavailable to ordinary users, then that restriction amounts to a prior restraint. Once it is established as a threshold matter that the First Amendment is in play, these arguments become difficult to resist.

The court hearing this case is now faced with a poor set of options. It could, first of all, invalidate the recall order on grounds that the law triggers and fails strict scrutiny. Strict scrutiny demands a compelling governmental purpose, which the government can most likely establish by asserting an interest in protecting the welfare of children. But strict scrutiny also requires narrow tailoring, and here the government will have a harder time. Continuing on the assumption that the CAD files needed to print the dangerous doll are “speech,” then the law fails any conventional definition of strict scrutiny. After all, with its recall order, the government is not in the business of suppressing defective and unreasonably dangerous dolls, but rather, “speech about defective and unreasonably dangerous dolls”: a phrase and an argument I paraphrase from the academic literature and the filings surrounding the *Defense Distributed* case,¹⁸⁶ as well as from the various turn-of-the-century software cases that characterize all computer code as speech about computer science.¹⁸⁷ It of course goes without saying that the First Amendment does not allow the government to prevent bad things by restricting speech about bad things.¹⁸⁸ And the attorney pressing these arguments will no doubt attempt to raise the stakes by pointing to news coverage about the hazardous doll, or even news coverage of the First Amendment litigation surrounding the doll, as evidence that the government is attempting to suppress speech “about” a matter of great

185. See, e.g., *United States v. Carolene Prods. Co.*, 304 U.S. 144 (1938); *Williamson v. Lee Optical Co.*, 348 U.S. 483 (1955).

186. Memorandum in Reply, *supra* note 15, at 7–8 (“firearms-related speech”); Josh Blackman, *The 1st Amendment, 2nd Amendment, and 3d Printed Guns*, 81 TENN. L. REV. 479, 522 (2014) (“speech about the right to keep and bear arms”).

187. See, e.g., *Junger v. Daley*, 209 F.3d, 481, 484–85 (6th Cir. 2000) (holding that computer source code is protected by the First Amendment).

188. See *Brandenburg v. Ohio*, 395 U.S. 444, 447–48 (1969) (“[T]he mere abstract teaching . . . of the moral propriety or even moral necessity for a resort to force and violence, is not the same as preparing a group for violent action and steeling it to such action. A statute which fails to draw this distinction impermissibly intrudes upon the freedoms guaranteed by the First and Fourteenth Amendments. It sweeps within its condemnation speech which our Constitution has immunized from governmental control.” (citations omitted)).

public importance.¹⁸⁹

The problem at this point is that the court cannot invalidate the order under strict scrutiny without implying that the government is nearly powerless to regulate 3D-printed goods in a general sense: arguably, the most aggressive circumscription of the government's economic regulatory powers since the New Deal. Whether one favors that result or not, it is simply too much to hang on the sophistry that the software enabling an end-user to print a doll adds up, if you think about it long enough, to "speech about dolls."

Any judge who perceives the stakes will look for a way to avoid such a senseless confrontation with the political branches. Assuming, then, that the case cannot be decided on alternative grounds, the judge will have to find a way to uphold the law while complying with the precedent holding that the First Amendment reaches software.

There are a few clear ways to do so. For instance, the judge could downgrade to the relatively lenient intermediate scrutiny standard by classifying the recall order as somehow content-neutral. Alternatively, the judge could apply strict scrutiny and disregard the recall order's obvious tailoring problems.¹⁹⁰ Finally, the Court might attempt to shoehorn the case rather awkwardly into one of the several "unprotected categories" of speech: most likely *Brandenburg v. Ohio*'s "incitement to imminent lawless action" standard.¹⁹¹

Any of these dilution techniques would allow courts to avoid ordering a root-and-branch deregulation of a mainstream manufacturing method. Yet, in form, each of them implies that heightened scrutiny is being applied across the board. This mixed message virtually ensures continued litigation over 3D printing and the First Amendment. This expansion of the universe of First Amendment litigation into a purely economic domain is what I call the "bubble."

The "collapse" of this bubble occurs when the diluted and confused standards applied to 3D printing are carried over into more traditional First Amendment contexts. So long as the courts adhere to the line that "information is speech," they must at least pretend to apply the same standards there as here. And in doing so, they will generate in the 3D-

189. See Memorandum in Reply, *supra* note 15, at 13, arguing that gun-related CAD files are the constitutional and functional equivalent of the Pentagon Papers).

190. See *supra* note 52–53.

191. *Brandenburg*, 395 U.S. at 447 ("[T]he constitutional guarantees of free speech and free press do not permit a State to forbid or proscribe advocacy of the use of force or of law violation except where such advocacy is directed to inciting or producing imminent lawless action and is likely to incite or produce such action.").

printing litigation huge banks of precedent in which loosely tailored laws fly past strict scrutiny, in which facially content-based laws are called content-neutral, and so on. The corrupted methodologies designed to accommodate the realities of these unbelievably peripheral First Amendment cases are bound eventually to contaminate and weaken hard-won protections that lie much closer to the core.

The first case in this cycle is already underway in *Defense Distributed*, a distressing work of constitutional opportunism that could hardly have been better crafted to expedite the dilution of the First Amendment.¹⁹²

C. *The Trap of Defense Distributed*

Defense Distributed, recall, is the case of the 3D-printable firearm. The State Department’s International Trade in Arms Regulations, or ITAR, require exporters of defense articles to obtain a governmental authorization before exporting them to other countries. When the scope of the definition of “defense articles” is unclear, a party submits a “commodity jurisdiction request” and ordinarily receives a response within ten days.¹⁹³ The State Department argues that CAD files for 3D-printable firearm components need preclearance before they are made globally available via the Internet. *Defense Distributed* argues that this scheme adds up to an unconstitutional prior restraint.¹⁹⁴

The case lays a trap by lulling courts into complacency with respect to the question that really matters in the long run: namely, whether the First Amendment should be brought to bear at all against the online distribution of 3D-printable products. The governmental interest in suppressing the proliferation of unlicensed and undetectable plastic firearms would appear compelling enough that the State Department should fare reasonably well even under strict scrutiny. And if that is the case, then the threshold question of whether the First Amendment applies in the first place becomes irrelevant to the outcome of the immediate litigation. Even if the judge is alarmed at the prospect of 3D-printable weaponry, then, there is no obvious need to upturn years of precedent¹⁹⁵ by withholding First Amendment coverage from an instance of computer code.

192. *Def. Distributed*, 2015 WL 4658921, at *1.

193. *See supra* notes 12–21 and accompanying text (discussing the arguments in *Defense Distributed*).

194. *Def. Distributed*, 2015 WL 4658921, at *7.

195. *See supra* notes 24–48 and accompanying text (discussing prior First Amendment cases involving computer code).

Therefore, the apparently safe means to uphold the State Department's regulatory scheme will be to concede at the outset that the First Amendment reaches 3D-printed guns before ultimately upholding the government's regulation of them. But that course of action will spring the trap, removing ordinary rational basis review from the table in future cases involving efforts to regulate the manufacture and distribution of 3D-printable products.

The actual litigation is still at an early stage, and we have only one judicial opinion to study. Judge Pitman, writing for the U.S. District Court for the Western District of Texas, denied Defense Distributed's motion for a preliminary injunction against the State Department's enforcement of its regulation.¹⁹⁶ To his credit, he attempted a hypothetical approach to the threshold question of whether the First Amendment reaches CAD files at all.¹⁹⁷ But once he assumed that CAD files are covered, he was then required to apply First Amendment doctrine to the facts; and in that part of the opinion, he ended up watering down a major Supreme Court holding handed down not two months earlier.

The issue concerned the level of scrutiny. Judge Pitman's opinion acknowledged that the State Department's regulation of data related to defense articles is facially content selective, which should mean strict scrutiny must be applied. He nevertheless treated the regulation as content-neutral, reasoning that the secondary effects test, discussed *supra*, allows facially content-discriminatory laws to be treated as content-neutral when the government's motives are not message suppressive.¹⁹⁸ This secondary effects approach is in keeping with most courts deciding software cases after the turn of the century, and it allowed Judge Pitman to uphold the law under a relatively lenient intermediate scrutiny review.

The problem is that the Supreme Court's freshly minted opinion in *Reed v. Gilbert*¹⁹⁹ had loudly and unmistakably taken Judge Pitman's approach off the table. Consider the following language from *Reed v.*

196. *Def. Distributed*, 2015 WL 4658921, at *1.

197. *Id.* at *6 (“Although the precise technical nature of the computer files at issue is not wholly clear to the Court, Plaintiffs made clear at the hearing that Defense Distributed is interested in distributing the files as ‘open source.’ That is, the files are intended to be used by others as a baseline to be built upon, altered and otherwise utilized. Thus, at least for the purpose of the preliminary injunction analysis, the Court will consider the files as subject to the protection of the First Amendment.”).

198. *Id.* at *8 (“[T]he Supreme Court has found regulations to be content-neutral where the regulations are aimed not at suppressing a message, but at other ‘secondary effects.’”).

199. *Reed v. Town of Gilbert, Ariz.*, 135 S. Ct. 2218 (2015).

Gilbert: “A law that is content-based on its face is subject to strict scrutiny regardless of the government’s benign motive, content-neutral justification, or lack of animus toward the ideas contained in the regulated speech.”²⁰⁰ One might think that Judge Pitman simply had not read *Reed* if not for his pretended attempt to harmonize *Reed* with the secondary effects approach. But there is no harmony to be found, and the attempt, quoted in a footnote below,²⁰¹ is not remotely plausible.

Such are the dilutive maneuvers judges must make to avoid bad outcomes under the “rule that information is speech.”²⁰² In the very first opinion handed down by the very first court to hear these issues, the dilutive process is already moving at light speed.

Defense Distributed has appealed the order, and it remains to be seen what the Fifth Circuit will do.²⁰³ The most likely result is that Defense Distributed will lose the case under strict scrutiny, intermediate scrutiny, or the *Brandenburg* standard. Or perhaps Defense Distributed’s First Amendment arguments will carry the day. But it would be very surprising for the Fifth Circuit to hold that the First Amendment has no bearing at all. And as long as the First Amendment has some bearing, however the case comes out, it is a major step forward into the morass that I have described.

III. CONCLUSIONS

It is simple to diagnose the problem that has set the First Amendment on course for a tech bubble. The basic mistake is in assuming that free

200. *Id.* at 2228.

201. Not surprisingly, the parties disagree as to whether the ITAR imposes content-based restrictions. “Government regulation of speech is content-based if a law applies to particular speech because of the topic discussed or the idea or message expressed.” *Id.* at 2227. The plaintiffs in *Defense Distributed* argue, because the regulations restrict speech concerning the entire topic of “defense articles” the regulation is content-based. “A regulation is not content-based, however, merely because the applicability of the regulation depends on the content of the speech.” *Asgeirsson v. Abbott*, 696 F.3d 454, 459 (5th Cir. 2012). Rather, determination of whether regulation of speech is content-based “requires a court to consider whether a regulation of speech ‘on its face’ draws distinctions based on the message a speaker conveys.” *See Reed*, 135 S. Ct. at 2227; *see also Ward v. Rock Against Racism*, 491 U.S. 781, 791 (1989) (stating that the principal inquiry in determining content-neutrality “is whether the government has adopted a regulation of speech because of disagreement with the message it conveys”); *Def. Distributed*, 2015 WL 4658921, at *8. Employing this inquiry, the Supreme Court has found regulations to be content-neutral where the regulations are aimed not at suppressing a message, but at other “secondary effects.”

202. *Sorrell v. IMS Health Inc.* 131 S. Ct. 2653, 2667 (2011).

203. *See Order, Def. Distributed*, No. 1:15-CV-372 (W.D. Tex. Oct. 1, 2015) (stating that proceedings in the district court will be stayed pending the resolution of the interlocutory appeal in the Fifth Circuit); Docketing Notice of Appeal, No. 15-50759 (5th Cir. Aug. 25, 2015).

speech protections attach to speech in itself rather than to, as Robert Post has written, the “social context.”²⁰⁴ This assumption, driven to its highest level of abstraction, makes something like a “rule that information is speech” more or less unavoidable.

It is sadly unrealistic to assume that the courts might avoid the tech bubble by re-centering First Amendment coverage on a narrower theory. The coverage of the First Amendment is by now too diverse to be explained in exclusive terms of the search for truth, self-realization, or political process rationales. It might make more sense to conceive of the First Amendment’s purpose as being grounded in some combination of the three, or in terms of a suspicion of governmental overreach. But these conceptions, even if accurate, are unlikely to generate the kinds of stable and bright lines that it will take to deter the most determined First Amendment entrepreneurs.

It also will not do simply for the new First Amendment entrepreneurs to lose. Courts can expand the scope of a body of doctrine merely by entertaining arguments in new contexts, and the manner in which they reject those arguments can influence a body of doctrine in its more traditional settings. Take *Perry Education Ass’n v. Perry Local Educators’ Ass’n*, for instance, in which the Supreme Court rejected a teachers union’s argument that a public school had turned its internal mailing system into a designated public forum by allowing access to a competing union.²⁰⁵ Justice White’s opinion argued emphatically that the mailing system was not a forum at all, and did not seem to equivocate on the point. Yet he engaged the argument (appropriately so), and in the process, he created the complex taxonomy of traditional public forums, designated public forums, limited public forums, nonforums, and government speech that today governs the use not only of internal mailing systems, but to some extent of the streets and parks.²⁰⁶

Or take the long string of defeats for coders who sought to invalidate sections of the DMCA that criminalized the sharing of digital rights management circumvention technologies.²⁰⁷ The courts in every case rejected the First Amendment arguments, but in the process, they

204. Post, *supra* note 9 at 1255 (“First Amendment analysis is relevant only when the values served by the First Amendment are implicated. These values do not attach to abstract acts of communication as such, but rather to the social contexts that envelop and give constitutional significance to acts of communication.”).

205. *Perry Educ. Ass’n v. Perry Local Educators’ Ass’n*, 460 U.S. 37, 46–55 (1983).

206. *Id.* at 45–49.

207. *See supra* notes 38–47 and accompanying text.

cemented the proposition that, as one federal district court put it, “[i]t cannot seriously be argued that any form of computer code may be regulated without reference to First Amendment doctrine.”²⁰⁸

These results demonstrate, and other scholars have argued, that the scope of First Amendment coverage is extremely difficult for courts to control. Over the long run, it appears that the Supreme Court’s capability to control the development of the law is confined mostly to the question of protection. The litigants themselves, meanwhile, exert a remarkable degree of control over the scope of coverage, which largely turns on which arguments are *raised* rather than which arguments are *accepted*.²⁰⁹

The Supreme Court should do what it can to create an inhospitable environment for this type of entrepreneurship. Perhaps the Court should take a cue from its early First Amendment cases, which placed what are now major areas of First Amendment law outside the scope of coverage by signaling to litigants that certain arguments were frivolous, or at least that litigants seeking to expand coverage carried a heavy burden of persuasion.²¹⁰ That kind of language can occasionally be seen in the lower courts even today, as in *Karn*, discussed *supra*, or in the *Pirate Investor LLC* case, in which the Fourth Circuit recently rejected summarily the argument that securities fraud might have anything to do with free speech: “Punishing fraud, whether it be common law fraud or

208. *Universal City Studios, Inc. v. Reimerdes*, 111 F. Supp. 2d 294, 326 (S.D.N.Y. 2000) (striking, via a content-neutrality argument, a DMCA provision against trafficking in DRM circumvention technologies); *see also* *Bernstein v. U.S. Dep’t of State*, 922 F. Supp. 1426, 1435 (N.D. Cal. 1996); *Junger v. Daley*, 209 F.3d 481, 484–85 (6th Cir. 2000) (“The Supreme Court has expressed the versatile scope of the First Amendment by labeling as ‘unquestionably shielded the artwork of Jackson Pollack, the music of Arnold Schoenberg, or the Jabberwocky verse of Lewis Carroll. Though unquestionably expressive, these things identified by the Court are not traditional speech. Particularly, a musical score cannot be read by the majority of the public but can be used as a means of communication among musicians. Likewise, computer source code, though unintelligible to many, is the preferred method of communication among computer programmers. Because computer source code is an expressive means for the exchange of information and ideas about computer programming, we hold that it is protected by the First Amendment.” (citation omitted)); *United States v. Elcom Ltd.*, 203 F. Supp. 2d 1111, 1126 (N.D. Cal. 2002) (“While there is some disagreement over whether object code, as opposed to source code, is deserving of First Amendment protection, the better reasoned approach is that it is protected. Object code is merely one additional translation of speech into a new, and different, language.”).

209. *See generally* Frederick Schauer, *The Politics and Incentives of First Amendment Coverage*, 56 WM. & MARY L. REV. 1613, 1614 (2015) (discussing the recent rise of cases attempting to widen the scope and boundaries of the First Amendment).

210. *See supra* notes 62–66 and accompanying text (discussing early First Amendment cases that placed a heavy burden on litigants to widen the scope of First Amendment protection).

securities fraud, simply does not violate the First Amendment.”²¹¹ Litigants raising expansionary arguments in the technology cases should generally be made to feel that they are testing judges’ credibility.

Creating that environment will have at least as much to do with what the Court *does not* say than with what it does say.²¹² Justice Breyer, concurring in the judgment in *Reed*, recently cited various instances of non-covered areas, and tellingly did not cite any case law *establishing* their non-coverage.²¹³ Instead, Justice Breyer explained, the non-coverage simply goes without saying:

Consider a few examples of speech regulated by government that inevitably involve content discrimination, but where a strong presumption against constitutionality has no place. Consider governmental regulation of securities, *e.g.*, 15 U.S.C. § 78l (requirements for content that must be included in a registration statement); of energy conservation labeling-practices, *e.g.*, 42 U.S.C. § 6294 (requirements for content that must be included on labels of certain consumer electronics); of prescription drugs, *e.g.*, 21 U.S.C. § 353(b)(4)(A) (requiring a prescription drug label to bear the symbol “Rx only”); of doctor-patient confidentiality, *e.g.*, 38 U.S.C. § 7332 (requiring confidentiality of certain medical records, but allowing a physician to disclose that the patient has HIV to the patient’s spouse or sexual partner); of income tax statements, *e.g.*, 26 U.S.C. § 6039F (requiring taxpayers to furnish information about foreign gifts received if the aggregate amount exceeds \$10,000); of commercial airplane briefings, *e.g.*, 14 CFR § 136.7 (2015) (requiring pilots to ensure that each passenger has been briefed on flight procedures, such as seatbelt fastening); of signs at petting zoos, *e.g.*, N.Y. Gen. Bus. Law Ann. § 399–ff(3) (West Cum. Supp. 2015) (requiring petting zoos to post a sign at every exit “ ‘strongly recommend[ing] that persons wash their hands upon exiting the petting zoo area’ ”); and so on.²¹⁴

These areas of law, in which litigants do not raise First Amendment issues and judges do not address them, are the models for limiting coverage. If it is necessary to address opportunistic First Amendment arguments about code, then it should be done in the cursory and

211. SEC v. Pirate Inv’r LLC, 580 F.3d 233, 255 (4th Cir. 2009).

212. See Schauer, *supra* note 17, at 1803 (“[B]ecause questions of noncoverage have rarely been before the courts—courts declining to extend coverage have almost always, as with the sexual harassment cases, done so with virtually no explanation—we are left to speculate about the reasons for non-coverage and to infer the pattern of noncoverage more from the legal system’s silence than from its words.”).

213. Reed v. Town of Gilbert, Ariz., 135 S. Ct. 2218, 2234–35 (2015) (Breyer, J., concurring).

214. *Id.*

dismissive manner demonstrated in cases such as *Pirate Investor LLC*,²¹⁵ *Railway Express Co.*,²¹⁶ or *Mutual Film Co.*²¹⁷ If it is *not* necessary, then the Court should not indulge opportunistic litigants by addressing their arguments in hypothetical terms. Doing so risks generating coverage-favorable dicta that could be used out of context to “prove” coverage in later cases.

I recognize that these recommendations are unrealistic. Judges would have to be more or less unanimous in their dismissal of “code as speech” to achieve the kind of prohibitive deterrent effect I have discussed. And in all likelihood, the ecumenical spirit that has come to define free speech law over the past several decades will lead at least a few and most likely a majority of the Justices to take the new claims seriously. When the Supreme Court of the 1940s blew off the possibility of a constitutional right to advertise, it is unlikely that its personnel had ever contemplated the possibility of a First Amendment right to advertise—much less following the recent repudiation of the *Lochner* era’s other constitutional protections for commercial activity.²¹⁸ Today’s Supreme Court will hear the new code cases in a very different context.

It is more realistic, then, to assume that the Supreme Court will wind up engaging with at least some of the arguments that the First Amendment should reach highly informatized industries. The key now will be to neutralize those arguments in a way that minimizes the potential to dilute First Amendment protections closer to the core.

To the extent that the Court applies generally applicable doctrine to the regulation of information technologies, it ensures some degree of dilution. The worst mistake the Court could make, for instance, would be to apply strict scrutiny to regulations that discriminate on the basis of the “content” of information flows. Though applying strict scrutiny in this instance might be more formally correct than applying intermediate scrutiny, it would also risk weakening the First Amendment’s central pillar: namely, strict scrutiny itself.

215. *Pirate Inv’r*, 580 F.3d at 255.

216. *Ry. Express Agency v. New York*, 336 U.S. 106, 107–08 (1949).

217. *Mut. Film Corp. v. Indus. Comm’n of Ohio*, 236 U.S. 230, 243–44 (1915).

218. Judge Kozinski and Stuart Banner have written that “to a Court only a few years removed from [the end of the *Lochner* era], a claimed right to advertise free from government interference must have sounded (1) suspiciously like a claimed right to bake free from government interference, and (2) a far cry from the brand-new and frighteningly amorphous right to distribute religious and political literature in public places.” Alex Kozinski & Stuart Banner, *The Anti-History and Pre-History of Commercial Speech*, 71 *TEX. L. REV.* 747, 774 (1993).

The Court may perceive the risk to the integrity of the strict scrutiny standard and attempt to shuffle the cases into intermediate scrutiny by manipulating the switching function between the two standards of review. The secondary effects doctrine, the “fiction” designed to accommodate the content-based regulation of adult entertainment,²¹⁹ would lend itself well to this effort. But any plain reading of the 2015 decision in *Reed* would indicate that the Court has taken secondary effects off of the table.

Even if the secondary effects argument *is* still available, moreover, intermediate scrutiny is still a closer scrutiny than the rational basis review that economic regulations would ordinarily receive. The Hobson’s choice between Lochnerism and dilution would be less pronounced than if strict scrutiny were applied, but it would still be there. And a dilution in the intermediate scrutiny standard used under the First Amendment, which governs much of the law of public protest, would be seriously damaging in its own right.

To me, these outcomes appear avoidable only if the new code cases are somehow quarantined from mainline First Amendment doctrine so that they are not decided under the same set of tests. If that does not mean ignoring the First Amendment arguments completely, it will probably mean devising a test, applicable essentially exclusively to cases involving computer code, that disposes of them before the “normal” battery of First Amendment doctrine is applied. Such a test would surely draw on a sense of rough justice and would likely under-protect some genuinely expressive uses of code.

For example, courts might adopt a “functionality doctrine”—similar to copyright’s functionality doctrine—that withheld speech protections from purely functional uses of code.²²⁰ Tim Wu has argued that a First Amendment functionality doctrine would be useful in the context of search engines, algorithmically generated music playlists, and so on.²²¹ That approach defines accurately the courts’ task as they confront the somewhat different contexts of information-based manufacturing and

219. *City of L.A. v. Alameda Books*, 535 U.S. 425, 448 (2002) (Kennedy, J., concurring).

220. Tim Wu, *Machine Speech*, 161 U. PA. L. REV. 1495, 1518 (2013) (“Functionality as a legal concept is employed mainly in copyright, patent, and trademark law, each of which has distinctive doctrinal versions. Sometimes described as the “nonfunctionality requirement,” this doctrine denies the benefits of the law to some otherwise qualifying expressive work, based on the argument that the work is primarily designed or intended to perform some task unrelated to the goals of the law in question. As such, it acts to prevent a party from using the law to achieve objectives completely unrelated to the goals of that law. It is a limit on opportunism.”).

221. *Id.* at 1531–33.

digital currencies as well: they must sort out parties who are genuinely speaking from parties who are seeking opportunistic protections for non-expressive enterprises.

The practical difficulty is in confronting the perennial argument that sharing code is the best and most efficient way for coders to communicate about coding methods: according to this argument, function and expression are inseverable. Even if most *uses* of 3D-printing blueprints, for instance, are purely functional, there will always be reasonably credible arguments from researchers and engineers who want First Amendment protections for certain uses of 3D-printing blueprints that are primarily expressive. Courts might initially attempt a close, situation-sensitive analysis to suss out the expressive uses from the functional uses. But they will quickly find that the functionality question in First Amendment law raises the same deep practical and philosophical difficulties that it does in copyright law.²²² Over time, the crush of litigation and the need for certainty will tend to congeal an initially case-specific inquiry into a more rule-bound analysis shaped by roughly drawn categories: for example, “digital blueprints for 3D printers are never protected.”

I suspect that this kind of categorical, rule-bound analysis would win few fans among those of us who generally value frankness and logical clarity in constitutional doctrine. In an earlier Article, I have myself expressed concerns that a categorical exclusion of certain types of computer code from First Amendment coverage will necessarily under-protect at least some legitimately protective interests.²²³ But some degree of overbreadth in the rules governing peripheral subject matter is nevertheless, in my view, a tolerable price to pay for a stronger free speech doctrine at the core.

I suspect that the line between “expressive” and “non-expressive” information streams will eventually be worked out, and that when that occurs, it will take the form of a cultural intuition rather than a doctrine made by lawyers. Today, we are inclined to put almost anything that can be expressed in a textual form, whether it is books, code, or DNA, under the heading of “information.” But concepts such as “information” are cultural constructions, and they come and go as intellectual history unfolds. As for us, we live in the very earliest days

222. Orit Fischman Afori, *The Role of the Non-Functionality Requirement in Design Law*, 20 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 847, 850–53 (2010) (discussing split among the courts on meaning of copyright’s non-functionality requirement).

223. Langvardt, *supra* note 28 at 94–96.

of computing and the Internet. The paper age is well within living memory. Perhaps that is why we talk about code as resembling a book: because it is a helpful metaphor, like the icon of a “file folder” or a “recycle bin,” for a technology that at some level we do not yet know. Our great-grandchildren may find little value or relevance in our twentieth- and twenty-first-century concept of “information.” That point, of course, is speculative. But as early as 1997, in *Reno v. ACLU*, the Supreme Court’s very first case on the First Amendment and the Internet, a seventy-seven-year-old Justice Stevens compared the World Wide Web “to both a vast library including millions of readily available and indexed publications and a sprawling mall offering goods and services.”²²⁴ Surely our generation is the last that cannot tell the difference between the two.

224. *Reno v. ACLU*, 521 U.S. 844, 853 (1997).