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FROM PREEMPTION TO CIRCUMVENTION: IF TECHNOLOGY REGULATES, WHY DO WE NEED REGULATION (AND VICE VERSA)?

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I. INTRODUCTION

Thank you so much for the kind introduction; however, I am now absolutely terrified: how am I possibly going to live up to it? Learning about the type of person David Nelson was makes me realize what a tremendous

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honor it is to present this memorial lecture.[1] It is also an honor and a pleasure to present to so many of my friends and colleagues whose work I follow closely, learn from, and respect enormously.

The title, I confess, is slightly misleading as the tap on my shoulder to send it came before I had written the talk. When I began work on the text, I realized that filling out the argument implied in the title would better fit a book length project than anything I could manage in a single lecture. Luckily, excellent presentations made earlier today by other speakers, covering the "vice versa" in the title—that is, issues that arise when technologies function in the service of existing law or regulation and particularly when they do so preemptively—address gaps I shall be leaving in my talk in focusing on flows of influence in the other direction. In particular, my attention will mostly be drawn to the role of law and regulation in circumstances where regulation by technology seems already to be in place, or, put another way, where regulation is already encoded in architecture.

My final confession is that I am trained as a philosopher, not as a lawyer. While I am committed to exploring the role of explicit regulation and law in relation to technology, I prefer to frame this exploration not merely in terms of artifacts encoding, enforcing, or preempting law, but as embodying values—specifically, political and ethical values. In so doing, I have tried to connect a set of questions that has been discussed in the field of information law for just over a decade[2] to questions discussed in the philosophical and social study of technologies for approximately half a century.[3] The more general question that has puzzled me since I began working in this area is this: if technology embodies values, and if technology is capable of regulation, what role is left for law and regulation? In this presentation, I focus on one specific aspect of this question about the role of technology, beginning with some background.

1. David Nelson started his practice in Silicon Valley in the 1960s with the firm that became Morrison & Foerster LLP. He was renowned not only for his knowledge of and interest in high tech law, but also for his remarkable memory for popular culture trivia. J.L. Pimsleur, *David E. Nelson*, SFGATE.COM (Feb. 4, 1999), http://articles.sfgate.com/1999-02-04/news/17678718_1_morrison-foerster-mr-nelson-douglas-s-nelson.

2. *See generally* LAWRENCE LESSIG, CODE: VERSION 2.0 (2006); Joel R. Reidenberg, *Lex Informatica: The Formulation of Information Policy Rules Through Technology*, 76 TEX. L. REV. 553 (1998).

3. *See, e.g.*, Lewis Mumford, *Authoritarian and Democratic Technics*, 5 TECH. & CULTURE 1 (1964).

II. POLITICAL TECHNOLOGY

Consider this quote by Langdon Winner from his most famous article, "Do Artifacts Have Politics?"[4] As you know, Winner, of course, answers, "Yes, they do!" and writes:

> In that sense, technological innovations are similar to legislative acts of political foundings that establish a framework for public order that will endure over many generations. . . . The issues that divide or unite people in society are settled not only in the institutions and practices of politics proper, but also, and less obviously, in tangible arrangements of steel and concrete, wires and semiconductors, nuts and bolts[5]

—and, I want to add, lines of code.

When I first read Winner's article many years ago, I immediately wanted to be a soldier in this intellectual struggle, and much of my early work looked at specific information systems and devices in order to point out their politics and why these politics were problematic if we did not pay sufficient attention to them.[6] Revealing the politics in search engines[7] and bias in computer systems (in collaboration with Lucas Introna and Batya Friedman, respectively) are two of my published contributions to this line of work.[8] But Winner's exhortations went beyond merely arguing that artifacts "have" politics—that is, the capacity to settle political issues or inherently favor certain structures of power and authority in society; they also call on creators of technical systems and devices to pay heed, early on in development, to moral and political factors:

> By far the greatest latitude of choice exists the very first time a particular instrument, system, or technique is introduced. Because choices tend to become strongly fixed in material equipment, economic investment, and social habit, the original flexibility vanishes for all practical purposes after the initial commitments are made. . . . For that reason the same careful attention one would give to the rules, roles, and relationships of politics must also be

4. Langdon Winner, *Do Artifacts Have Politics?*, *in* THE WHALE AND THE REACTOR: A SEARCH FOR LIMITS IN AN AGE OF HIGH TECHNOLOGY 19 (1986).

5. *Id.* at 29.

6. *Cf.* Finn Brunton & Helen Nissenbaum, *Vernacular Resistance to Data Collection and Analysis: A Political Theory of Obfuscation*, FIRST MONDAY, May 2011, http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/3493/2955.

7. Lucas D. Introna & Helen Nissenbaum, *Shaping the Web: Why the Politics of Search Engines Matters*, 16 INFO. SOC'Y 169 (2000).

8. Batya Friedman & Helen Nissenbaum, *Bias in Computer Systems*, 14 ACM TRANSACTIONS ON INFO. SYS. 330 (1996).

> given to such things as the building of highways, the creation of television networks, and the tailoring of seemingly insignificant features on new machines.[9]

My own chance to respond to Winner's exhortation to design with politics in mind came in 2006 when I collaborated with Daniel Howe in designing and developing TrackMeNot ("TMN"),[10] and again in 2009 with colleagues at Carnegie Mellon and Stanford on Adnostic.[11] In creating these small systems, we were also testing out Values-at-Play ("VAP"), a framework developed with Mary Flanagan, a games designer, and Daniel Howe.[12] Inspired by the practical turn in Winner's work and others in a similar vein,[13] VAP was conceived as a systematic approach to guide an analysis of values embodied in technology, as well as the practical foundation for a heuristic aimed at designers wanting to include values among the standards they considered as they created new systems.

In what follows, a brief description of TMN, Adnostic, and VAP will serve as a departure point for a more general discussion of the relationship between law and technology: how they affect one other, how they support, or how they obstruct. The goal of this discussion is ultimately to shed light on our question, "if we have technology, why do we need law?"—regarding the limits to regulation by technological design. I am still an ardent admirer of Winner, but—and I am sure he would agree with this sentiment—it is not quite as straightforward as simply plugging values into a technology and then believing that you have immediately had some positive and protracted impact on society.

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9. Winner, *supra* note 4, at 29.

10. Daniel C. Howe & Helen Nissenbaum, *TrackMeNot: Resisting Surveillance in Web Search*, *in* LESSONS FROM THE IDENTITY TRAIL: ANONYMITY, PRIVACY, AND IDENTITY IN A NETWORKED SOCIETY 418 (Ian Kerr et al. eds., 2009).

11. *See generally* VINCENT TOUBIANA, ARVIND NARAYANAN, DAN BONEH, HELEN NISSENBAUM & SOLON BAROCAS, ADNOSTIC: PRIVACY PRESERVING TARGETED ADVERTISING (2010), *available at* http://crypto.stanford.edu/adnostic/adnostic-ndss.pdf.

12. Mary Flanagan, Daniel C. Howe & Helen Nissenbaum, *Embodying Values in Technology: Theory and Practice*, *in* INFORMATION TECHNOLOGY AND MORAL PHILOSOPHY 322 (Jeroen van den Hoven & John Weckert eds., 2008); Mary Flanagan, Daniel C. Howe & Helen Nissenbaum, *Values at Play: Design Tradeoffs in Socially-Oriented Game Design*, *in* PROCEEDINGS OF ACM CHI 2005 CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS 751 (SIGCHI & Ass'n for Computing Mach. eds., 2005).

13. *See, e.g.*, James H. Moor, *What Is Computer Ethics?*, 16 METAPHILOSOPHY 266 (1985).

III. TRACKMENOT, ADNOSTIC, VALUES-AT-PLAY

So what is TrackMeNot? Initially created as a lightweight Firefox extension, available for free download, it now also functions in Chrome.[14] TMN automatically generates fake search queries and sends them to Google, Bing, Baidu, and Yahoo!. Although it does not do anything to protect against online identification, the idea is to guard users against profiling based on logs of search queries accumulated by search engines; the fake queries sent by TMN perform an obfuscatory function. Further discussion of how TMN works can be found on the website and in various publications.[15]

Among those who have chosen to use TMN—at a modest estimate approximately 800,000 total downloads (not people!)—there has been tremendous support and enthusiasm. However, there has also been criticism ranging from charges that it does not work because search engines will easily be able to find and delete TMN-generated queries to charges that it is immoral because it involves dishonesty and wasted resources. As designers committed to the practical importance of moral as well as engineering standards, we cannot focus only on the "Does it work?" question and ignore the charges of immorality; accordingly, we have been attending to both.[16]

VAP, developed with Mary Flanagan and Daniel Howe, provides not only an analytic framework for revealing moral and political values in the design of technologies but the foundations for a heuristic to which designers, who are committed to taking values into account in practice, may refer. It posits two key activities: (1) Discovery and (2) Translation, which are performed not in a single rigid order but in iterative cycles. In Discovery, designers seek to identify values relevant to given projects, sometimes revealed in efforts to locate the sources of these values. In some instances, the sources include the very functional definition of a project; in others, the sources of values emerge when designers discover that seemingly technical decisions have implications for values promoted or blocked by a system in question. Having enumerated values by attending the possible sources, a second component of Discovery is an activity we have labeled *operationalization*. Operationalization typically involves developing concrete

14. To download TrackMeNot, see TRACKMENOT, http://cs.nyu.edu/trackmenot/ (last visited Sept. 24, 2011).

15. Brunton & Nissenbaum, *supra* note 6; Howe & Nissenbaum, *supra* note 10; Vincent Toubiana, Lakshminarayanan Subramanian & Helen Nissenbaum, TrackMeNot: Enhancing the Privacy of Web Search (Mar. 22, 2011) (unpublished manuscript), *available at* http://arxiv.org/abs/1109.4677; TRACKMENOT, *supra* note 14.

16. Brunton & Nissenbaum, *supra* note 6; Toubiana, Subramanian & Nissenbaum, *supra* note 15.

definitions of relevant values for the context of a given design project. It forms a crucial bridge between highly abstract concepts—such as privacy, security, and autonomy—and Translation, the second key activity. Translation, in turn, involves three components: (a) implementing values in design features and architecture, (b) resolving the inevitable conflicts of values that arise as design proceeds, and (c) verifying that one's efforts have been sound by both engaging with designers' reflective capacities as well as ascertaining users' responses.

In the case of TMN, one source of values was, clearly, the definition of the project—that is, protecting privacy in web search. We understood privacy as contextual integrity, or as flow of personal information that is consistent with context-specific informational norms, and we operationalized this as preventing access by search engines to the accurate record of your web searches. When we realized that our implementation did not protect against identification, we realized that we were not able to pursue all our functional and value ends simultaneously and decided to prioritize the effort to obfuscate users' profiles and maintain simplicity and ease-of-use above the effort to anonymize. When users complained that TMN would occasionally send politically or sexually charged search terms, we responded by offering users the ability to select the RSS feeds that would seed TMN's searches, but we decided against direct censorship. When critics pointed out TMN's vulnerabilities to side channel and other attacks, we defended against these attacks, all the while mindful of usability goals, and continuously engaged in iterative cycles of Discovery, operationalization, implementation, conflict resolution, verification, and back again to Discovery.[17]

Adnostic, developed for the purpose of protecting privacy in the face of online behavioral advertising, also constitutes a case in which the functional definition was among the sources of values embodied in it. Responding to concerns over dominant models of behavioral advertising, in which users are tracked across websites in order to target ads to them based on their behavioral profiles, we took seriously its defenders, who claimed that better targeting of ads lured more advertising revenue—the web's lifeblood—ultimately supporting innovation and free content. But, we took issue with the belief that pervasive tracking was necessarily tied to this promise. So, we set about designing a system—Adnostic, a Firefox extension—that internalizes tracking to the browser and is based on the profile it builds from users' browsing habits, which it never shares with third parties; it selects ads

17. Howe & Nissenbaum, *supra* note 10; Toubiana, Subramanian & Nissenbaum, *supra* note 15.

to present to users. For Adnostic to function properly, ad servers would need to collaborate, serving browsers not one, but many, ads from which Adnostic selects the most appropriate.

As with TMN, Adnostic raises questions on various fronts. For example, some might consider its touch too soft for it merely asks websites it visits not to allow third-party tracking and does not attempt to block this entirely. Others might argue that in enabling targeting at all, it buys into a paradigm of user profiling that true protection of privacy should not support at all. These criticisms amount to disagreements over the ways we have operationalized the relevant values, ways we have chosen to implement them, and ways we have chosen to resolve values in conflict. I will pursue this discussion no further, except to say that you can learn more about Adnostic and download the code from the Adnostic website, but, unfortunately, without ad networks willing to step forward to present ads in accordance with Adnostic's requirements, unlike TMN, the system is not able to function "in the wild."[18]

IV. LAW AND TECHNOLOGY; TECHNOLOGY AND LAW

From these brief accounts of TrackMeNot and Adnostic, let us return to the question at the heart of this talk. As I, and others, have observed, law and technology both have the power to organize and impose order on society. Panel presentations earlier today richly observed ways in which they both systematically afford certain behaviors, activities, and practices, and systematically impede others; both have capacities to enable, constrain, allow, and prevent. Both have—to invoke a term Bruno Latour uses—prescriptive capacities.[19] Of course, the prescriptive capacity of law and public policy has been studied for centuries; technology's prescriptive character, however, has emerged as a subject of explicit philosophical, social, and legal study only recently and even so, on a relatively small scale. For some of us, it is the multifaceted relationship between these two prescriptive systems—law and technology—that has been most compelling.

Addressing this relationship were some of the comments we heard earlier today about techno-law, as well as a body of literature that is concerned with whether built objects, including technology, that preempt or enforce law are problematic.[20] In artifacts like subway turnstiles, ten-foot-high barbed wire

18. To download Adnostic, see ADNOSTIC, http://crypto.stanford.edu/adnostic/ (last visited Sept. 24, 2011).

19. Bruno Latour, *Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts*, *in* SHAPING TECHNOLOGY/BUILDING SOCIETY 225 (Wiebe Bijker & John Law eds., 1992).

20. *Cf.* Ian Kerr, *Digital Locks and the Automation of Virtue*, *in* "RADICAL EXTREMISM" TO "BALANCED COPYRIGHT": CANADIAN COPYRIGHT AND THE DIGITAL AGENDA 247

fences at border crossings, devices for monitoring criminals on parole, or full-body scans at airports, technology is put in the service of law in these ways. Tying these cases to the title of my talk, they bear on the question of why we need technical pre- and proscriptions when we already have legal ones. There is much to discuss: observing the different ways technology can support law, evaluating which forms of technical enforcement or preemption are acceptable, and finally, whether it is better to achieve desired behaviors by forcing, or merely by "nudging."[21] As mentioned in my introductory remarks, however, I will not be pursuing this line of thinking further, beyond acknowledging it as a reference point in the larger landscape and, of course, recognizing its importance.

Unlike these scenarios, in which law exists and technology's prescriptive role needs to be explained, the scenarios I want to discuss in the time remaining are those in which technology embodies values or regulates behavior, and we are left to wonder what, if anything, is the role left for law and public policy. In the words of the talk's title, where it seems possible to rule effectively by technology alone, is not law simply redundant? Even if this potential exists in only a handful of cases, one might pose the question: why not dispense with legal regulation entirely when code purportedly regulates on its own?

V. REGULATION BY DESIGN AND ITS LIMITS

Law may be needed in cases where regulation by technology contradicts societal values, a concern Winner raises when arguing that artifacts, by themselves, have the capacity to settle political controversies.[22] Bypassing political channels of collective decision-making, he calls into question the moral legitimacy of technology-based prescriptions (or regulation), particularly when they run afoul of values to which a society explicitly subscribes.[23] In the paradigmatic case of Robert Moses's infamous overpasses, regulators ought to have been awake to the fact that they reinforced socio-economic and racial prejudices, thereby obstructing our

(Michael Geist ed., 2010); Danny Rosenthal, *Assessing Digital Preemption (and the Future of Law Enforcement?)*, 14 NEW CRIM. L. REV. 576 (2011).

21. *Cf.* RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS (2008); *see also generally* Roger Brownsword, *Lost in Translation: Legality, Regulatory Margins, and Technological Management*, 26 BERKELEY TECH. L.J. 1321 (2011) (discussing techno-regulation, regulatory registers, the amplification of prudential signals, and the shift away from normative signals in a technologically managed environment).

22. Winner, *supra* note 4, at 22–29.

23. *Id.* at 38.

explicit commitments to equality of opportunity.[24] Another case, discussed by Rachel Weber, was the ultimately successful effort to redesign the cockpits of fighter planes in the U.S. Air Force so that they fit the generally smaller dimensions of women's bodies.[25]

Yet in countless instances where there may be no obvious contradiction between legal commitments and built systems, technology emerges as a mode of governance outside of government. Technology mediates and gives texture to certain kinds of private relationships; it weighs in on the side of one vested interest over others. What is law doing in these cases; what might it do? In addressing these questions, I acknowledge that I am working in a tiny corner of the sweeping philosophical terrain that covers fundamental questions such as "What is the function of law?", "What is the function of technology?", "Who makes the decisions?", and so on. My aim, here, is to tug on special instances of these larger questions, particularly as they apply to recent controversies involving information technologies and digital media, including some of the questions we have asked at this workshop.

Taking a few steps back, I offer this thought: life confronts us with many obstacles. For example: steep inclines; cancer; gravity; tall trees with the juicy fruit at the very top; and the case Winner made famous, of Robert Moses's nine-foot-high overpasses making it difficult for commuters on the twelve-foot-high buses to reach many of Long Island's beaches.[26] Locks are obstacles, as are seatbelts, body scanners, machine safety overlocks, one-way streets, and queues in banks and supermarkets. Among these obstacles are mechanisms that get in our way in systematic, politically relevant ways—for example, discriminating against some people over others. Not all are problematic: locks, for example, are very nice for the security of owners, but they badly discriminate against thieves. A question we may think to pose is this: among the obstacles we confront each day of our lives, there are some that we seem to accept as impenetrable barriers around which we adjust the patterns of our activities—we may even welcome, support, or invite them—and there are others that we conceive as challenges that must be overcome. We say, "No, we're not going to be stopped from flying—we are going to build airplanes" or "Cancer is a terrible thing—we have to find a cure for it."

24. *See id.* at 22.

25. Rachel N. Weber, *Manufacturing Gender in Military Cockpit Design*, *in* THE SOCIAL SHAPING OF TECHNOLOGY 372 (Donald MacKenzie & Judy Wajcman eds., 1999).

26. Winner, *supra* note 4, at 22–25.

VI. PFAFFENBERGER'S TECHNOLOGICAL DRAMAS

To explain how this distinction relates to our discussion of technology and law, I would like to introduce a second theorist to you, Bryan Pfaffenberger, an anthropologist by training, working in the field of Science and Technology Studies ("STS"). His seminal article, "Technological Dramas," offers an approach to understanding how technologies evolve in response to social and political factors.[27] Pfaffenberger asks the same question as Winner—"Do artifacts have politics?"—but in contrast to Winner, answers a resounding "No." Now I do not entirely agree with Pfaffenberger because I do believe that values may be embedded in technical systems due to specific material characteristics. But Pfaffenberger's challenge to Winner, at the very least, forces us to acknowledge that the processes by which technology comes to embody values, or comes to have the power to regulate, are complex and, at times, even indeterminate. Let us consider the argument a bit more closely.

As I see it, there are two main contentions forming Pfaffenberger's argument. One establishes that as technologies evolve—whether a simple pen or a complex network, such as the Internet—there is always flexibility in its design: there are many inflection points and a variety of paths a designer could have chosen, arriving not at something that looks like *this* but *that*.[28] With information technology, because systems can be developed and changed quickly, one may actually observe this evolution over a relatively short period of time, and experience shows how much flexibility there is in the design of digital artifacts. The second contention highlights technology's interpretative flexibility: when you introduce a (technological) system into a society, it does not arrive fully thought out. Without interpretation it may not even be immediately understood.[29] As symbolic actors, we need to—and these are the particular terms Pfaffenberger uses—"regulate" technology discursively, drawing on some of our familiar cultural mythologies and secular rituals to establish what it is and what it can do. This discursive "regularization" is one of the processes that establish the political aims of a technology.[30] In Pfaffenberger's words, "artifacts [] are projected into a

27. Bryan Pfaffenberger, *Technological Dramas*, 17 SCI. TECH. & HUMAN VALUES 282 (1992).

28. *Id.* at 283; Trevor J. Pinch & Wiebe E. Bijker, *The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other*, *in* THE SOCIAL CONSTRUCTION OF TECHNOLOGICAL SYSTEMS 17 (Wiebe E. Bijker et al. eds., 1989).

29. Pfaffenberger, *supra* note 27, at 285.

30. *Id.* at 291.

spatially defined, discursively regulated social context, which is crucial to actualizing the technology's constructed cultural and political aims."[31]

According to Pfaffenberger's theory of technological dramas, these aims are not built in to a technical artifact itself; instead, they are shaped by the accompanying interpretations given to it by the technical artifact's "design constituency"—the group of people introducing an artifact into society. In the process of regularization, the design constituency promulgates a particular culturally and politically laden interpretation by structuring the discursive regulation.[32] For the design constituency, this process involves not only explaining how a technology links into and satisfies certain cultural or symbolic needs that people have, but also actively intervening to adjust the legal and legislative landscape to make it hospitable to the system in question.[33]

You may well wonder why the design constituency must seek these adjustments in the landscape. For me, the answer to this question constitutes Pfaffenberger's core insight: the reason they do it is to define away alternatives, to define away the design and interpretative flexibility; the design constituency wants us to see the technology in a certain way and only in that way.[34] And it is through this process, according to Pfaffenberger, that technology has politics. Armed with these concepts, we may return to the terms of a dichotomy I introduced earlier—namely, how it comes to be that certain artifacts are made to seem not merely like challenges that must be overcome, but like impenetrable barriers that must be accepted as they are. Where the regularizing activities of design constituencies (or others) are successful, they manage to define away the alternatives. When it happens that a design constituency manages to regularize a particular meaning for a given technical system, Pfaffenberger would say that the constituency has asserted "logonomic control" over it.[35] Finally, it is through the exercise of logonomic control and not by dint of material features that artifacts become political because, by then, the political aims will be experienced as inevitable, irresistible.[36]

There is more to technological drama than regularization; it is merely a first move, the first act, if you will. It is hardly ever all there is. Pfaffenberger admits that even for a determined design constituency, it is difficult to unite

31. *Id.*
32. *Id.*
33. *Id.* at 294.
34. *Id.* at 295.
35. *Id.* at 296.
36. *Id.*

whole-heartedly behind one unambiguous account of a technology's symbolic meaning—there is always going to be some symbolic ambiguity, and out of this ambiguity the opponents of a particular system and the values expressed through it can stir discontent. Because cultures are so often a riot of beliefs and mythologies, opponents of a design constituency's interpretations of a particular system may find conflicting cultural norms amidst ambiguous root paradigms from which to construct competing interpretations. In this second act, called "adjustment," the politicization of a technology shifts course. An example Pfaffenberger uses is an entryway bench provided by the upper classes in Victorian Britain for servants, who were generally disenfranchised through uncomfortable living conditions and humiliated by deliberately poorly designed furniture. The servants "adjusted" the meaning of these benches by drawing on a competing cultural norm around compassion and the common good, which facilitated solidarity among themselves and pity for employers whom they saw as needlessly cruel and insecure.[37]

A third act in Pfaffenberger's technological dramas, "reconstitution," involves not merely reinterpreting a given system but also redesigning it materially and, potentially, beginning a drama all over again.[38] This redesigned system, which Pfaffenberger calls a "counterartifact," is given its cultural meaning and values by those who before were part of the impact constituency, that is, those negatively affected by the original system. The new drama involves an accompanying societal discourse aimed at earning acceptance for the counterartifact and its associated mythology. Accordingly, "[r]egularization can indeed become a tool of reconstitution; it can be used to enforce change as well as continuity."[39]

Now if you, like me (and Langdon Winner), stubbornly resist the idea that the material character of an artifact does not matter at all to its political character and that political values can be fully shaped by adjusting symbolic context alone, then you will welcome reconstitution as evidence that not even Pfaffenberger holds that interpretative flexibility knows no bounds. Sometimes design alterations are necessary to complement the political aims of supporting mythologies.[40] How much of the politics inheres in material design and how much in discourse and interpretation is the heart of much philosophizing about technology and is too big an issue to resolve here. My

37. *Id.* at 301.
38. *Id.* at 304.
39. *Id.*
40. *Id.*

aim, thus far, has been to present one plausible account of these intertwined influences.

There is still one more act in Pfaffenberger's technological drama, you could say, the final act: closure, or normalization (or "designification").[41] It is the phase when competing discourses are no longer present in the public's attention, and the politics of a technical system recede from consciousness. Whatever public controversy has played out in the public sphere has gone silent for the time being. (It can, of course, flare up again with new dramas following.) During this phase, an artifact, like a mountain or a tree, has become something "natural" or, in Pfaffenberger's words, "the drama [] drop[s] out of the technology."[42] This, in some sense, is a dangerous phase, when people are inclined to accept that technology is neutral because it is when people forget that there are values or politics involved in technology at all. It is not that there is no longer politics in these normalized systems, but merely that we are no longer attuned to it; we forget that political values are still there. To counteract such losses in astuteness, Pfaffenberger recommends STS as the "political philosophy of our time" so that we may continue to advance our understanding of the ways technology is linked to fundamental principles and values of ethics and politics.[43]

VII. IF TECHNOLOGY REGULATES, WHY DO WE NEED REGULATION?

Having armed ourselves with insights from Pfaffenberger's technological dramas, we return to consider the role of regulation in relation to technologies that, so to speak, regulate. As illustrations, I will refer to a couple of cases that are quite well known, cookies and the Digital Millennium Copyright Act ("DMCA"), the latter far better known to many of you in this audience than to me! Specific inflection points in each of these cases, understood in Pfaffenberger's terms, reveal fascinating variations in the relationship between these two regulators.

A. DMCA AND ANTI-CIRCUMVENTION

As we know, the DMCA, which came into law in 1998, followed fraught multi-year, multi-national deliberations. In large part, its passage was driven by a combination of radical changes due to digital information technologies in the creation, use, and distribution of creative content, and an ensuing

41. *Id.* at 308–09.
42. *Id.* at 308.
43. *Id.* at 309.

panic in the content industry due to mortal threats these changes seemed to pose to established business models. Within the big picture, the inflection point of greatest interest to me here is the DMCA's anti-circumvention clause, urged by the content industry as a necessary antidote to vulnerabilities in technology-based copyright protection measures. I have yet to hear an expert in the field who is willing to say that any given technological protection measure ("TPM") or digital rights management ("DRM") system cannot be broken.

In Pfaffenberger's terms, the drama begins with the industry attempting to regulate, that is, prevent unauthorized copying of content by means of TPMs. The industry, or in this case the design constituency, introduces these systems, buttressing them with a rich discourse about intellectual property—supporting creativity, protecting their copyrights, preventing piracy, and so forth. The trouble is, this is not enough because TPMs are not tamper-proof and a large segment of the impact-constituency is not swayed by the mythos. In other words, there is interpretative flexibility and a struggle over which version will prevail. Many proponents of peer-to-peer file sharing systems, such as Gnutella and BitTorrent, and circumvention software, such as DeCSS, reject the discourse of the likes of the content industry; they see TPMs as obstacles, but obstacles that must be challenged, overcome.[44] The content industry, however, wants us to see TPMs not as challenges to be overcome but as impenetrable barriers. Since the technology is not itself impenetrable, the industry must find other ways to, in Pfaffenberger's terms, define away technical alternatives; this they have achieved through the DMCA's anti-circumvention clause.

I find the concept of a "handoff" useful. To begin, it was the law of copyright that constrained people's behaviors. When digital technologies radically loosened the hold of copyright, defenders of intellectual property rights turned to technical means—that is, they handed off power to technology. When technology proved imperfect, there was another handoff, again, back to law and regulation, not directly to constrain behavior as with the law of copyright itself, but to shape how people saw, understood, and interpreted prevailing TPMs.

As we know, the drama is not yet over, even though, in my view, systems such as iTunes are close to normalized. There are continued efforts to *adjust*

44. *Cf.* Edward W. Felten, *DRM and Public Policy*, 48 COMM. ACM 112 (2005); Cory Doctorow, *Pushing the Impossible*, GUARDIAN (Sept. 4, 2007, 2:10 PM), http://www.guardian.co.uk/technology/2007/sep/04/lightspeed; Fred von Lohmann & Wendy Seltzer, *Death by DMCA*, IEEE SPECTRUM (June 2006), http://spectrum.ieee.org/computing/software/death-by-dmca.

our interpretation of TPMs and associated anti-circumvention measures. Some, such as the Electronic Frontier Foundation, portray them not as defensible protectors of property rights but as violators of other rights, compiling stories of economic calamity, injustice for people trying to use digital content legally, and problems with market competition.[45] Ed Felten, another in this vein, defied the music industry's ban on the publication of his method for breaking the industry's digital watermarking technologies of the day. The industry cited anti-circumvention, Felten cited academic freedom and the "freedom to tinker."[46] And the cycle continues!

B. COOKIES

The development of HTTP cookies is another case that can be illuminated by the notions of technological dramas. In contrast with our previous case, it illustrates the perils of believing one can leave all regulation to technology alone. According to the standard account, which we will accept here, Lou Montulli created web cookies in order to facilitate shopping carts, and shopping, on the web.[47] Because the web is stateless, without cookies, each time you would visit a particular website—in fact, each time you would send a command to this website—these actions would be treated as distinct, unconnected events. The exchange of cookies, simple data-objects, back and forth between browser and website enables a continuity in the relationship. In 1995 the cookie was integrated into the Mosaic and Microsoft Internet Explorer browsers, and in 1997 it was introduced as a standard in Request for Comments ("RFC") 2109 to the Network Working Group ("NWG").[48]

In RFC 2109, the original design specification for the cookie ensured that cookies generated by a particular website could only be retrieved by that website. Thus, when a person revisits a given website, that website could retrieve only the cookie that it had placed in the person's browser. Montulli and his colleague David Kristol made their intention clear when they wrote in the RFC, "The intent is to restrict cookies to one, or a closely related set of hosts. . . . We consider it acceptable for hosts host1.foo.com and host2.foo.com to share cookies, but not a.com and b.com."[49] So the intent of

45. ELEC. FRONTIER FOUND., UNINTENDED CONSEQUENCES: TEN YEARS UNDER THE DMCA (2008), *available at* http://www.eff.org/files/DMCAUnintended10.pdf.

46. *Id.* at 2.

47. *Cookies*, STUDIO 360 (Dec. 17, 2010), http://www.studio360.org/2010/dec/17/cookies/.

48. David Kristol & Lou Montulli, *HTTP State Management Mechanism*, INTERNET ENG'G TASK FORCE (Network Working Grp., Request for Comments No. 2109, Feb. 1997), *available at* http://tools.ietf.org/pdf/rfc2109.pdf.

49. *Id.* at 16.

the original designers of the cookie was quite clearly to build the value of user privacy into cookies from the beginning of their use online. But by 1997, the advertising industry had already figured out ways to circumvent Montulli and Kristol's restriction on cookie exchange. In that year, articles in the business press were trumpeting DoubleClick's workaround, which involved dropping their own cookies into people's browsers by attaching them to ad images incorporated into the websites that people visited.[50] Thus was born the so-called "third-party" cookie that was able to follow people around from site to site. In head-to-head competition with Montulli and Kristol, the advertising industry-backed competing standard RFC 2965, which allowed placement of third-party cookies, was ultimately victorious.[51] The rest, as they say, is history.

In hindsight and in light of Pfaffenberger's dramas, I am inclined to say that while Montulli and Kristol's RFC 2109 embodied the value of privacy into web cookie design, there was no accompanying attempt to "regularize" it—that is, to discursively regulate the social context into which this design proposal was being projected. I would like to think that had we—"we" being those of us who would have liked this standard to win out—done the discursive groundwork, things might have turned out differently. In contrast with the DMCA case, there was no design constituency equivalent to the content industry undertaking the challenge of defining away alternatives. There was no defender of the original standards and practices to champion a web cookie anti-circumvention clause before the online advertising industry, with an urgent and vested interest, hijacked momentum and succeeded in regularizing a different technical standard. Things could have turned out differently; had the standard defined in RFC 2109 won out, been "regularized," and been buttressed with supporting anti-circumvention regulation, the prohibition on third-party cookies would have seemed an impenetrable barrier. As it happened, however, alternatives were not successfully defined away, and the standard was treated as a mere challenge to overcome.

At this time, with interest in a Do Not Track option for the web percolating in Congress,[52] the Federal Trade Commission,[53] and the

50. Judith Messina, *New Media's Hot Play*, 13 CRAIN'S N.Y. BUS., no. 24, June 16, 1997, at 1.

51. David Kristol & Lou Montulli, *HTTP State Management Mechanism*, INTERNET ENG'G TASK FORCE (Network Working Grp., Request for Comments No. 2965, Oct. 2000), *available at* http://tools.ietf.org/pdf/rfc2965.pdf.

52. Do-Not-Track Online Act of 2011, S. 913, 112th Cong. (2011), http://www.govtrack.us/congress/bill.xpd?bill=s112-913.

Department of Commerce,[54] there is reason to hope that political controversies that were settled with the selection of a cookie standard may be revisited. If so, the privacy community, now far more extensive and better organized, will have an opportunity to articulate adjustment strategies (perhaps including regulation) and develop counter-technologies that were missing in the late 1990s. There is evidence that both are occurring; the struggle is on.

VIII. TRACKMENOT, ADNOSTIC, AND THE POLITICS OF PRIVACY

We have come full circle back to TrackMeNot and Adnostic, systems that embody the value of privacy. As you may recall, these systems were inspired by the aim of saying and doing something political through technology, particularly in domains where there seemed to be foot-dragging and resistance from policy makers both in the private and public sectors. If Winner is correct and we can say that these systems have politics, or in other words, can assert that they regulate by affording and constraining behaviors in politically relevant ways, have we done enough? What role is left for regulation, per the question of my title? I hope to have shown that indeed, beyond design, there is work to do to regulate discursive conditions so they are hospitable to one's political ends. Law and regulation are an important part of both practically and symbolically preparing the environment so that a technical system projected into it can do its work—and sometimes that work is political. We cannot take it for granted that with clever enough design, TMN, Adnostic, or anything else will enter the scene and protect privacy.

Drawing wisdom from Pfaffenberger's dramas, cultural mythologies and secular rituals are rich sources for the creation of discourses that can serve to regularize a system. Experience with TMN is consistent with Pfaffenberger's claims that for systems to have politics—that is, to function politically in society—more than design is needed. In the case of counterartifacts, in particular, this will mean looking for cultural beliefs that contradict those buttressing entrenched systems. If search engines and ad networks draw on cultural mythologies of individualism to support their particular brand of personalization, opponents can tap into the same pool of cultural

53. FED. TRADE COMM'N, PROTECTING CONSUMER PRIVACY IN AN ERA OF RAPID CHANGE (2011), *available at* http://www.ftc.gov/os/2010/12/101201privacyreport.pdf.

54. INTERNET POL'Y TASK FORCE, U.S. DEP'T OF COMMERCE, COMMERCIAL DATA PRIVACY AND INNOVATION IN THE INTERNET ECONOMY: A DYNAMIC POLICY FRAMEWORK (2010), *available at* http://www.ntia.doc.gov/files/ntia/publications/iptf_privacy_greenpaper_12162010.pdf.

mythologies but focus on stereotyping and unfair discrimination, forms of illegitimate personalization that impinge on individual freedoms. There are other powerful cultural beliefs surrounding a right to freedom in educational, intellectual, informational, and political pursuits that, too, could lend support to adjustment and reconstitution of entrenched discourses of personalization. Mobilizing this symbolic discourse and placing web search within it could contribute to an environment that is more welcoming to the political aims of systems such as TMN.

In the effort to gain a toehold for Adnostic, technical functionality is not the greatest barrier. We have found ourselves up against a cultural mythology of innovation, incredibly powerful in the context of the Internet and web. In projecting a new system into this context, one should avoid at all cost being viewed as going against it. So powerful is this context that it succeeds against just about any effort to develop regulation restricting what established actors can do either in the systems they develop or the policies guiding the application of these systems. In seeking to protect privacy, any inclination that agencies such as the Federal Trade Commission and the Department of Commerce may have to develop regulation must clear the great hurdle of innovation. It seems hardly to matter that the clarion call of innovation seems oddly stacked in favor of industry-based innovation and is so vaguely defined that it amounts more to a free-for-all than a serious guidepost.

With Adnostic, we have tried to pick holes in the logic of the online advertising industry. They say that personalized ads support robust commerce online as well as both technical and business innovation. Our answer is that Adnostic still offers personalization (i.e., targeting) of ads but without third-party tracking and the vast and sinister apparatus of surveillance that goes along with it. Thus far, logic has not worked in our favor, and we have not yet interested regulatory bodies in putting pressure on ad networks to enable individuals to choose Adnostic as a medium for ad presentation. We may need to go looking for the ambiguities in root paradigms, to pit the halo of innovation that industry seems to have cornered to something equally powerful. Perhaps it will be to encourage a norm of equal opportunity to innovate, or to promote the idea that your web browser is *your* agent, not an infiltrator on your system working in someone else's service.

IX. A ROLE FOR LAW AND REGULATION

So that is the discursive realm of cultural myth and secular ritual. What might be a role for law in contributing to a hospitable environment into which systems for protecting privacy are projected? Clearly, laws that would directly regulate what can and cannot be done with data in specific areas,

such as web searches or online tracking, would set parameters in ways that are favorable to such efforts. Or, even more ambitiously, we may try to resuscitate a general privacy law applicable to private as well as public sectors. If successful, the efficacy of systems designed to protect privacy would be enhanced (just as laws against burglary enhance the efficacy of locks). My colleague Ira Rubinstein believes we might actually pass a law, but other colleagues who work in this area of regulation do not see much cause for optimism.[55]

Short of these, what else might contribute to a hospitable environment? I have often thought that legal recognition of something like "respect for expressive choice" holds promise. It might work as follows: the law would recognize an expressed desire not to be tracked for those who have installed TMN on their browsers. Within the technical community, where the favored means of protection is strong encryption, there is skepticism over whether TMN "works," by which they mean whether it could withstand a concerted attack by an entity determined to filter out the fake, TMN-generated queries. Giving legal recognition to those who have installed TMN as an expressed desire not to be profiled is a bit like an anti-circumvention clause for privacy in web search. In such cases, the law plugs holes that technology leaves open; it, to quote Pfaffenberger, defines away alternatives.[56] Recognizing expressive choice is also consistent with one element of the expectation of privacy test because adoption of a system such as TMN clearly indicates an actual expectation of privacy on the part of a user (the other element being that this expectation is reasonable).

A second role for law that falls short of privacy regulation but may create a more hospitable environment for the private development and uptake of privacy protective systems is to stipulate limits on the Terms of Service, perhaps by affording greater latitude to individuals to negotiate terms that allow them greater control over their relationship with online entities. At present, the pressure on users to agree to lengthy or unclear Terms of Service documents can be a one-click "flank attack" on rights we ought to retain in relation to websites we visit. In the early days of TMN, there was considerable debate over whether it was illegal. I have to admit, I was actually quite afraid for awhile—likely without cause—because TMN did violate some of the search engines' Terms of Service agreements, which forbid users from initiating automatically-generated searches. This net, which was probably cast to prevent denial-of-service attacks, also captured TMN.

55. Ira S. Rubinstein, *Privacy and Regulatory Innovation: Moving Beyond Voluntary Codes*, I/S: J.L. & POL'Y INFO. SOC'Y (forthcoming winter 2011).

56. Pfaffenberger, *supra* note 27, at 295.

Although no angry search companies have come after us, we should not have to depend on another party's largesse to develop or use privacy enhancing technologies.

In preparing for this talk, the distinction between obstacles that are viewed as challenges and obstacles that are viewed as impenetrable barriers was an exciting discovery for me as I sought to understand why technology cannot regulate all by itself, even if we allow that it can regulate at all. (Or, in other words, why politics is needed even if we allow that technology itself has politics.) However well-designed, well-executed, and well-fortified our praiseworthy, value-enhancing systems are, incipient weaknesses are inevitable and pose a threat to their programmed action. In these cases, an important role for regulation is to remove the temptation to exploit these weaknesses. As such, regulation contributes to a view of these systems as impenetrable barriers rather than challenges to work around.

I will stop here and leave you with that thought.

Thank you.