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## CONTENTS

### ARTICLES

- 133 DYNAMIC ENVIRONMENTALISM AND ADAPTIVE MANAGEMENT: LEGAL OBSTACLES AND OPPORTUNITIES  
*Jonathan H. Adler*
- 163 DYNAMIC ECOLOGY AND DYNAMIC ECONOMICS: THE FOUNDATION OF AUSTRIAN ENVIRONMENTAL ECONOMICS  
*Terry L. Anderson*
- 179 PEOPLE-MADE LAW: SPONTANEOUS ORDER, CHANGE, AND THE COMMON LAW  
*James L. Huffman*
- 203 AUSTRIAN ECOLOGY: RECONCILING DYNAMIC ECONOMICS AND ECOLOGY  
*Shawn E. Regan*

### STUDENT COMMENTS

- 229 BITCOINS VS. STATE MONEY TRANSMISSION LAWS: PROTECTING CONSUMERS OR HINDERING INNOVATION?  
*Jacob Hamburger*
- 255 THE CURIOUSLY DIFFICULT TASK OF DETERMINING WHO OWNS A COPY OF A COPYRIGHTED WORK  
*Daniel Schneider*



DYNAMIC ENVIRONMENTALISM AND ADAPTIVE MANAGEMENT:  
LEGAL OBSTACLES AND OPPORTUNITIES

*Jonathan H. Adler\**

INTRODUCTION

“Stationarity is dead.”<sup>1</sup> So declared the authors of a widely cited *Science* article on water management.<sup>2</sup> In the 21st Century, resource managers can no longer operate under the assumption that “natural systems fluctuate within an unchanging envelope of variability.”<sup>3</sup> Long-standing assumptions about the operation of natural systems would have to be revised due to climate change and other anthropogenic influences on environmental systems. Resource decisions could no longer be guided by models that rely upon the past to predict the future. The inevitable and yet uncertain ecological changes wrought by climate change would demand the development of more adaptive and resilient approaches to environmental management.<sup>4</sup>

Climate change brought the need for more adaptive approaches to environmental management to the forefront of environmental policy discussions. Yet the emerging reality of climate change is not the only reason more dynamic and resilient approaches to environmental protection are necessary. Stationarity was never a sound premise for ecological management.<sup>5</sup> Ecologists have long recognized the dynamic nature of environmen-

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<sup>1</sup> See P.C.D. Milly et al., *Stationarity Is Dead: Whither Water Management?*, 319 SCI. 573, 573 (2008).

<sup>2</sup> See, e.g., Robin Kundis Craig, “Stationarity is Dead”—*Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34 HARV. ENVTL. L. REV. 9 (2010); Gerald E. Galloway, *If Stationarity Is Dead, What Do We Do Now?*, 47 J. AM. WATER RESOURCES ASS’N 563 (2011); Daniel E. Schindler & Ray Hilborn, *Prediction, Precaution, and Policy Under Global Change*, 347 SCI. 953 (2015).

<sup>3</sup> See Milly et al., *supra* note 1, at 573.

<sup>4</sup> See, e.g., Roger Pielke Jr., *Collateral Damage from the Death of Stationarity*, GLOBAL ENERGY & WATER CYCLE EXPERIMENT NEWS, May 2009, at 5, available at [http://sciencepolicy.colorado.edu/admin/publication\\_files/resource-2725-2009.11.pdf](http://sciencepolicy.colorado.edu/admin/publication_files/resource-2725-2009.11.pdf).

<sup>5</sup> See *id.* at 5 (“[S]ome scholars have argued that treating natural systems as stationary has always been a mistake.”).

tal systems, but their counsel had not been heeded.<sup>6</sup> If the need for more adaptive and resilient approaches to environmental management has become urgent, it is perhaps because the need was ignored for so long.<sup>7</sup> If stationarity is dead, perhaps it never existed.

Most of today's environmental laws and programs are based upon outmoded assumptions about the relative stability of natural systems when free of human interference.<sup>8</sup> Scientists have understood for decades that ecosystems are anything but stable. To the contrary, ecosystems are incredibly dynamic and change over time due to both internal and external forces. An ecosystem is the "paradigmatic complex system," exhibiting dynamic and discontinuous behavior.<sup>9</sup> To be effective, therefore, environmental management systems must themselves be sufficiently adaptive.<sup>10</sup>

Noted ecologist Daniel Botkin argues that "solving our environmental problems requires a new perspective" of environmental concerns that incorporates contemporary scientific understandings and embraces humanity's role in environmental management.<sup>11</sup> Recognizing a new perspective is but the first step, however. There is also a need to identify how this perspective can inform environmental policy, not just on the ground but in the very institutional architecture of environmental law and management. Then comes the really hard part, for even if it is possible to conceive of how environmental management should proceed, it may be devilishly difficult to put such ideas into practice. Old habits die hard. Legal and institutional norms die even harder.

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<sup>6</sup> See *infra* notes 42-48 and accompanying text.

<sup>7</sup> See Pielke, *supra* note 4, at 7 ("[T]he death of stationarity has been long overdue."); see also Craig Anthony (Tony) Arnold & Lance H. Gunderson, *Adaptive Law and Resilience*, 43 ENVTL. L. REP. 10,426, 10,428 (2013) ("[M]any observers across a range of disciplinary and ideological perspectives have recognized the glaring and urgent need for U.S. law to improve its adaptive capacity").

<sup>8</sup> See DANIEL B. BOTKIN, *DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY* 33-41 (1990) (discussing predominant ecological theories) [hereinafter BOTKIN, *DISCORDANT HARMONIES*]; see also Arnold & Gunderson, *supra* note 7, at 10,426 ("The foundational assumptions of U.S. environmental law are questionable.").

<sup>9</sup> See Robin Kundis Craig & J.B. Ruhl, *Designing Administrative Law for Adaptive Management*, 67 VAND. L. REV. 1, 37 (2014) [hereinafter Craig & Ruhl, *Designing Admin. Law*] ("Ecosystems, of course, are one of the paradigmatic complex systems—in the words of C.S. Holling, 'complex, nonlinear systems where discontinuous behavior and structural change are the norm.'" (citing C.S. Holling, *What Barriers? What Bridges?*, in *BARRIERS AND BRIDGES TO THE RENEWAL OF ECOSYSTEMS AND INSTITUTIONS* 3, 19 (Lance H. Gunderson et al. eds., 1995))).

<sup>10</sup> See Arnold & Gunderson, *supra* note 7, at 10,426 ("Environmental law is under dynamic and relentless pressure to develop a framework that is adaptive as we understand more of the practical implications of the resilience of natural and social systems.").

<sup>11</sup> DANIEL B. BOTKIN, *THE MOON IN THE NAUTILUS SHELL: DISCORDANT HARMONIES RECONSIDERED* 6 (2012) [hereinafter BOTKIN, *DISCORDANT HARMONIES RECONSIDERED*]. Botkin first made this point some two decades earlier in BOTKIN, *DISCORDANT HARMONIES*, *supra* note 8. While this perspective has influenced environmental policy discussions, there is, as yet, little evidence that this perspective has had much effect on actual environmental policies.

Accounting for dynamic nature may require revisiting conventional notions of environmental protection and the underpinnings of environmental law and management. This presents an enormous challenge. Conventional approaches to environmental management may be unable to heed dynamic environmentalism's call so long as they are confined by contemporary notions of fair administrative process, whether such constraints are the product of norms, statutes or even the Constitution. The challenge of recognizing dynamic nature as such implicates the very foundations of contemporary environmental law and policy.

Part I of this paper provides a brief overview of how contemporary ecological science has upset traditional notions of ecology, emphasizing the dynamic nature of natural systems. Part II explains how the dominant approach to environmental protection, as constrained as it is to begin with, is a particularly poor fit for the management and protection of dynamic ecological systems. Part III provides a brief overview of "adaptive management," the dominant management approach suggested to accommodate the dynamic nature of natural systems. Part IV then identifies some of the obstacles to (and opportunities for) adaptive management in environmental law. The aim here is to identify potential avenues for further study and analysis more than to define or delimit the prospects for adaptive management in environmental law.

## I. DYNAMIC ENVIRONMENTALISM

Contemporary environmental law embodies archaic assumptions about the natural world. Through the middle of the 20th century, "the predominant theories in ecology either presume[d] or ha[d] as a necessary corollary a very strict concept of a highly structured, ordered, and regulated, steady-state ecological system."<sup>12</sup> Under this view, nature naturally tended toward an equilibrium state—a "balance"—absent human interference.<sup>13</sup> Maintaining and protecting this balance was, in this view, ecologically superior and ultimately better for humanity as well.<sup>14</sup>

Contemporary ecological science has "dismissed" these theories and the accompanying notion of a "balance of nature."<sup>15</sup> Notions such as Aldo Leopold's famous "land ethic"<sup>16</sup> are based upon an "equilibrium paradigm"

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<sup>12</sup> BOTKIN, *DISCORDANT HARMONIES RECONSIDERED*, *supra* note 11, at 12.

<sup>13</sup> See Daniel B. Botkin, *Adjusting Law to Nature's Discordant Harmonies*, 7 *DUKE ENVTL. L. & POL'Y F.* 25, 26 (1996).

<sup>14</sup> *Id.*

<sup>15</sup> Timothy H. Profeta, *Managing Without Balance: Environmental Regulation in Light of Ecological Advances*, 7 *DUKE ENVTL. L. & POL'Y F.* 71, 71 (1996); see also MICHAEL ALLABY, *BASICS OF ENVIRONMENTAL SCIENCE* 154 (1996) ("The 'balance of nature' is a myth. Our planet is dynamic, and so are the arrangements by which its inhabitants live together.")

<sup>16</sup> See ALDO LEOPOLD, *A SAND COUNTY ALMANAC* 204 (1949).

that has unraveled under examination.<sup>17</sup> In Wallace Kaufman's eloquent formulation, the equilibrium paradigm of ecology made for "good poetry but bad science."<sup>18</sup> Leopold's land ethic provided the foundation for an environmental philosophy that ultimately had little to do with ecology. However normatively or aesthetically attractive such conceptions of nature may be, and however much such conceptions facilitate the development of legal rules governing human interactions with nature, they lack a meaningful grounding in contemporary ecological science.

The architecture of contemporary environmental law was erected when the equilibrium paradigm still held sway. As a consequence, the edifice of environmental law sits on an unstable foundation. The equilibrium paradigm justified "a wide range of prohibitions on human activities that alter 'natural' land and water systems" and other environmental restrictions on productive activity.<sup>19</sup> Yet this paradigm has not "been rejected in ecology and replaced with a complex, stochastic nonequilibrium one."<sup>20</sup> As Botkin explains,

we had approached environmental problems from the wrong set of assumptions, assumptions deeply rooted in our civilization and culture. These assumptions, considered at the time to be scientific, were in fact heavily based on ancient pre-scientific myths about nature.<sup>21</sup>

Myth or not, these conceptions heavily influenced the contours of environmental law and regulation.

Contemporary ecological science embraces a more dynamic understanding of the natural world and rejects the idea of a "balance of nature" that would exist but for human interference. Two insights about natural systems are essential to the contemporary view. First is the recognition that ecological systems are always in flux. There is no true "natural" state for ecosystems.<sup>22</sup> No "climax" or endpoint toward which ecosystems move or evolve if left undisturbed. Second, in this day and age, there is no part of the globe in which ecosystems exist wholly apart from human influence. As noted environmental historian William Cronon observed, "the natural world is far more dynamic, far more changeable, and far more entangled

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<sup>17</sup> See A. Dan Tarlock, *The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law*, 27 LOY. L.A. L. REV. 1121, 1122-23 (1994).

<sup>18</sup> Wallace Kaufman, *How Nature Really Works*, AM. FORESTS, Mar.-Apr. 1993, at 17, 18. For a fuller explication of Kaufman's views, see WALLACE KAUFMAN, *NO TURNING BACK: DISMANTLING THE FANTASIES OF ENVIRONMENTAL THINKING* (1994).

<sup>19</sup> Tarlock, *supra* note 17, at 1122.

<sup>20</sup> *Id.* at 1123.

<sup>21</sup> BOTKIN, *DISCORDANT HARMONIES RECONSIDERED*, *supra* note 11, at xi.

<sup>22</sup> *Id.* at 328 ("Every natural . . . system passes through many states, all of which are 'natural' in the traditional meaning of the word.").

with human history than popular beliefs about ‘the balance of nature’ have typically acknowledged.”<sup>23</sup>

The idea of a balance of nature still infects much environmental discourse, and remains embedded into much environmental law and policy, but scientists recognize that ecosystems are not static systems and do not trend toward equilibria. They are complex, dynamic systems that are always changing and evolving and that even exhibit a degree of chaotic flux; “ecosystems fluctuate without equilibrium and beyond the capabilities of humans to assess and control them without error.”<sup>24</sup> Like social and market-based economic systems, ecological systems are “complex, dynamic, and subject to abrupt and unpredictable change.”<sup>25</sup>

Even those who once embraced the static view of ecosystems now recognize that “an ecosystem is a thermodynamically open, far from equilibrium system.”<sup>26</sup> Botkin states it well: “Nature changes over essentially all time scales, and in at least some cases these changes are necessary for the persistence of life, because life is adapted to them and depends on them.”<sup>27</sup> Further, “nature is not a constant, it is not like a single tone held indefinitely, but is composed of patterns that themselves change, like a melody played against random background noises.”<sup>28</sup>

Equally important to the idea that ecosystems are inherently dynamic, complex, and adaptive systems is the recognition that nature does not exist apart from humanity, and humanity inevitably influences the course and operation of natural systems. Human beings have been altering the landscape and altering the operation of ecosystems for centuries. Whether such a degree of influence is desirable, it is unavoidable, for “there is no longer any part of the Earth that is untouched by our actions in some way.”<sup>29</sup> “Nature,” as an ideal, is over.<sup>30</sup>

Consider the concept of wilderness. The federal Wilderness Act “recognize[s]” wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.”<sup>31</sup> It further defines wilderness as, *inter alia*,

an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to pre-

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<sup>23</sup> William Cronon, *Introduction: In Search of Nature*, in UNCOMMON GROUND: RETHINKING THE HUMAN PLACE IN NATURE 23, 24 (William Cronon, ed. 1996) [hereinafter Cronon, *Introduction*].

<sup>24</sup> Profeta, *supra* note 15, at 73.

<sup>25</sup> Arnold & Gunderson, *supra* note 7, at 10,426.

<sup>26</sup> Eugene P. Odum, *Great Ideas for Ecology for the 1990s*, 42 BIOSCIENCE 542, 542 (1992).

<sup>27</sup> BOTKIN, DISCORDANT HARMONIES RECONSIDERED, *supra* note 11, at 12.

<sup>28</sup> BOTKIN, DISCORDANT HARMONIES, *supra* note 8, at 66.

<sup>29</sup> BOTKIN, DISCORDANT HARMONIES RECONSIDERED, *supra* note 11, at 349.

<sup>30</sup> Cf. BILL MCKIBBEN, THE END OF NATURE (1989).

<sup>31</sup> 16 U.S.C. § 1131(c) (2012).

serve its natural conditions and which . . . generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable . . .<sup>32</sup>

Yet whether the “imprint” of human activity is “noticeable,” it is there. However wild and untouched by human hands a given landscape may appear, it is not truly primeval or “natural.” The idea of a wilderness as a natural area completely free from human influence is as fantastical as a unicorn.

The idea of wilderness is really something in our minds, not something that exists out in nature.<sup>33</sup> Wilderness, writes Cronon, “is not quite what it seems. Far from being the one place on earth that stands apart from humanity, it is quite profoundly a human creation.”<sup>34</sup> The idea of “wilderness” as it has manifested itself in the United States in particular, has been quite unnatural, and has denied the very humanity of this continent’s first human inhabitants.<sup>35</sup> That is, the “natural” state of many ecosystems is one that was heavily influenced by Native Americans.<sup>36</sup> Yet “wilderness serves as the unexamined foundation on which many of the quasi-religious values of modern environmentalism rest.”<sup>37</sup> It is an idea that, left unexamined, “poses a serious threat” to responsible environmental management.<sup>38</sup>

In practice, wilderness today consists of those areas that people have decided to cordon off, separate from the rest of nature, and “protect” from additional human intrusion. Yet the very act of defining and demarcating such lands, and treating them differently from other lands nearby, alters them. True “wilderness”, in the sense of places free from human influence of any kind, does not exist.<sup>39</sup> “[W]ilderness is managed land, protected by three-hundred page manuals specifying what can and cannot be done on

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<sup>32</sup> *Id.*

<sup>33</sup> See William Cronon, *The Trouble with Wilderness; or, Getting Back to the Wrong Nature*, in UNCOMMON GROUND: RETHINKING THE HUMAN PLACE IN NATURE 69 (William Cronon ed., 1995) [hereinafter Cronon, *Trouble with Wilderness*]; see also Cronon, *Introduction*, *supra* note 23, at 25 (“[T]he way we describe and understand that world is so entangled with our own values and assumptions that the two can never fully be separated.”).

<sup>34</sup> Cronon, *Trouble with Wilderness*, *supra* note 33, at 69.

<sup>35</sup> *Id.* at 79 (“The myth of the wilderness as ‘virgin,’ uninhabited land had always been especially cruel when seen from the perspective of the Indians who had once called that land home.”).

<sup>36</sup> See generally CHARLES C. MANN, 1491: NEW REVELATIONS OF THE AMERICAS BEFORE COLUMBUS (2005) (discussing the scope and extent of Native American influences on the North American environment).

<sup>37</sup> Cronon, *Trouble with Wilderness*, *supra* note 33, at 80.

<sup>38</sup> *Id.* at 81.

<sup>39</sup> See BOTKIN, DISCORDANT HARMONIES RECONSIDERED, *supra* note 11, at 349 (“Since there is no longer any part of Earth that is untouched by our actions in some way, either directly or indirectly, there are no wildernesses in the sense of places completely unaffected by people.”). In the context of climate change, this point was made by Bill McKibben. See BILL MCKIBBEN, *supra* note 30.

it.”<sup>40</sup> If natural parks and designated wilderness areas represent what is natural, “then nature is synonymous with human intervention,” for it is only human intervention that keeps such places as they are.<sup>41</sup> Designated wilderness areas are, in this respect, merely the most conspicuous example of a wider phenomenon.

Contemporary ecology has embraced the dynamic view of nature and recognizes the pervasiveness of human influence on natural systems. Even steadfast proponents of the equilibrium model have recanted.<sup>42</sup> Yet there is relatively little evidence of contemporary understanding in contemporary environmental policy. The environmental laws and regulations on the books are “out of date.”<sup>43</sup> As Botkin observes, “whether or not environmental scientists know about geological time and evolutionary biology, their policies ignore them.”<sup>44</sup> Too often environmental policy and protection measures are based upon “nonrational, ideological beliefs instead of rationally derived facts in harmony with modern understanding of the environment.”<sup>45</sup> Yet, many of the most pressing environmental problems today “exhibit the hallmark characteristics of complex adaptive systems.”<sup>46</sup> As Professor Ruhl explains, “[t]heir behavior emanates from a multitude of diverse, dispersed sources responding to coevolving interactions, feedback loops, and nonlinear cause and effect properties.”<sup>47</sup>

The dynamic nature of natural systems is no longer disputed, but it is not embodied in contemporary environmental laws. Federal environmental law, in particular, incorporates and relies upon outdated conceptions of nature and environmental problems, often at the expense of more effective environmental protection. As Botkin counsels, “[t]he idea that change is natural and the failure to accept it have created problems in natural-resource management and have led to destructive, undesirable results.”<sup>48</sup> Existing environmental management efforts are hampered by their lack of fit with the nature of the environment they seek to manage.

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<sup>40</sup> N. Katherine Hayles, *Simulated Nature and Natural Simulations: Rethinking the Relation Between the Beholder and the World*, in UNCOMMON GROUND: RETHINKING THE HUMAN PLACE IN NATURE 409, 410 (William Cronon ed., 1995).

<sup>41</sup> *Id.*

<sup>42</sup> See Odum, *supra* note 26. Odum is a highly influential ecologist who was largely “responsible for implanting the idea in the mind of lawyers and policy makers that natural systems tend toward equilibrium if left undisturbed.” See A. Dan Tarlock, *International Water Law and the Protection of River System Ecosystem Integrity*, 10 BYU J. PUB. L. 181, 209 (1996).

<sup>43</sup> Profeta, *supra* note 15, at 71.

<sup>44</sup> BOTKIN, DISCORDANT HARMONIES RECONSIDERED, *supra* note 11, at xiii.

<sup>45</sup> *Id.* at 18.

<sup>46</sup> J.B. Ruhl, *Regulation by Adaptive Management—Is It Possible?*, 7 MINN. J.L. SCI. & TECH. 21, 22 (2005) [hereinafter Ruhl, *Regulation by Adaptive Management*].

<sup>47</sup> *Id.* at 22-23.

<sup>48</sup> BOTKIN, DISCORDANT HARMONIES RECONSIDERED, *supra* note 11, at 13.

## II. STATIC REGULATION

The dominant approach to environmental protection in the United States has been a top-down, administrative regulatory model.<sup>49</sup> Though often adorned with symbolic flexibility or market-oriented ornamentation, the system retains a relatively rigid and centralized structure at its core. Flexibility is rarely more than interstitial or on the margin. Existing environmental laws also implicitly, and at times explicitly, presume an antiquated, static equilibrium model of natural systems. This is particularly true of those statutes which seek to conserve species or otherwise manage living natural resources.<sup>50</sup> Yet for all of its faults, the conventional administrative regulatory model seems entrenched. Writes Botkin:

If you ask ecologists whether nature is always constant, they will always say “No, of course not.” But if you ask them to write down a policy for biological conservation or any kind of environmental management, they will almost always write down a steady-state solution.<sup>51</sup>

The conventional administrative regulatory model of environmental protection is capable of achieving some environmental gains, and it has.<sup>52</sup> Yet this approach experiences severely diminishing marginal returns once the “low-hanging fruit” are picked.<sup>53</sup> It is relatively rigid and maladaptive, and is increasingly unable to generate environmental gains at an acceptable cost. As Richard Stewart observes, centralized environmental regulation is inherently limited by “the inability of central planners to gather and process the information needed to write directives appropriately responsive to the diverse and changing conditions of different economic actors; and the failure of central planning commands to provide the necessary incentives and flexibility for environmentally and economically beneficial innovation.”<sup>54</sup> Adopting market-based reforms helps on the margin, but only on the mar-

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<sup>49</sup> See, e.g., Richard B. Stewart, *Models for Environmental Regulation: Central Planning Versus Market-Based Approaches*, 9 B.C. ENVTL. AFF. L. REV. 547, 547 (1992) (“The United States, despite its market-based economy, has relied heavily on central planning-style, ‘command-and-control’ tools to achieve its environmental protection goals.”).

<sup>50</sup> See, e.g., Holly Doremus, *The Endangered Species Act: Static Law Meets Dynamic World*, 32 WASH. U. J.L. & POL’Y 175, 182 (2010) (“[T]he [Endangered Species Act] as implemented relies on an unrealistically static vision of nature and on a commitment to static law.”); *id.* (“[T]he regulatory provisions of the ESA assume a vision of nature that is both static and simplistic, in which affirmative management is not required and the best thing people can do for other species is to leave them alone.”).

<sup>51</sup> BOTKIN, DISCORDANT HARMONIES RECONSIDERED, *supra* note 11, at xii.

<sup>52</sup> See generally ENVIRONMENTAL TRENDS, <http://www.environmentaltrends.org/> (lasted visited April 27, 2015) (listing facts and analysis of different environmental trends).

<sup>53</sup> See Ruhl, *Regulation by Adaptive Management*, *supra* note 46, at 21 (“For decades so-called ‘command-and-control’ regulation has picked the low-hanging fruit . . .”).

<sup>54</sup> Richard B. Stewart, *United States Environmental Regulation: A Failing Paradigm*, 15 J.L. & COM. 585, 587 (1996).

gin so long as environmental protection is dominated and constrained by a top-down administrative regulatory model.<sup>55</sup>

The dynamic, complex environmental problems that remain are particularly difficult to address through traditional regulatory approaches because “there are no readily available targets for the prescriptions and, even worse, we have no idea what response the system would exhibit to any particular command.”<sup>56</sup> Many existing environmental laws impose binary decisions on agencies—either a species is endangered or it is not, a level of pollution may be anticipated to endanger health or it is not, etc. Once such determinations are made, specific regulatory consequences follow automatically. If a species is endangered, it triggers the regulatory requirements of the Endangered Species Act (ESA).<sup>57</sup> If a pollutant may be reasonably anticipated to threaten health and welfare, certain types of emission controls must be imposed.<sup>58</sup> And so on. Meaningful agency discretion only comes after the initial determination is made.

This regulatory approach was adopted, in part, because Congress was wary of leaving agencies more discretion about how to handle certain types of environmental problems for fear that agencies would shirk their duties or devote resources elsewhere. Yet a consequence of this approach is that agencies do not have as much flexibility or discretion as might be desirable to match specific policy measures with specific problems, and abandon the largely “one-size-fits-all” approach embodied in much federal environmental law. Many environmental laws leave little room for marginal analysis or comparative assessment of alternative policy measures.

Markets are also complex, adaptive, and dynamic systems.<sup>59</sup> Just as it is not always possible to predict the ecological consequences of specific environmental management measures, it is often not possible to predict the market effects of such measures, or—perhaps more importantly—how such interventions will affect the interplay of economic decisions and environmental outcomes. Market actors will often respond to regulatory constraints in unanticipated ways, with unforeseen (and perhaps undesirable) effects.

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<sup>55</sup> Even many “market-based” regulatory programs require a degree of information and predictive capacity that lies beyond conventional capabilities. See, e.g., Michael W. Wara, *Instrument Choice, Carbon Emissions, and Information* (Stanford L. Sch. Working Paper, 2014), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2469397](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2469397).

<sup>56</sup> Ruhl, *Regulation by Adaptive Management*, *supra* note 46, at 25.

<sup>57</sup> See *Tenn. Valley Auth. v. Hill*, 437 U.S. 158 (1978).

<sup>58</sup> See, e.g., 42 U.S.C. § 7521(a)(1) (2012); see also *Massachusetts v. EPA*, 549 U.S. 497 (2007).

<sup>59</sup> See, e.g., W. Brian Arthur, Steven N. Durlauf & David A. Lane, *Introduction to the Volume of THE ECONOMY AS AN EVOLVING COMPLEX SYSTEM II*, at 1, 3-4 (W. Brian Arthur, Steven N. Durlauf & David A. Lane eds., 1997); François Moreau, *The Role of the State in Evolutionary Economics*, 28 *CAMBRIDGE J. ECON.* 847 (2004).

Examples of unintended, and often unanticipated, effects from environmental regulatory interventions are legion.<sup>60</sup>

- Restricting a private landowner's ability to cut pine trees on his land today may preserve those trees as habitat for red-cockaded woodpeckers today, but it may also discourage other landowners from allowing their trees to grow long enough to become woodpecker habitat in the future.<sup>61</sup>
- Banning the use of ethylene dibromide EDB, a pesticide, due to concerns about its carcinogenicity reduces human exposure to one potential health threat, but may result in the increased production of natural compounds, such as aflatoxin, that pose an equal, if not greater, threat to human health.<sup>62</sup>
- Mandating emission reductions of all ozone precursors seems like an effective means of reducing tropospheric ozone pollution (smog) until one learns that ozone formation is a function of the ratio of such pollutants in the atmosphere, and not merely their absolute level, such that emission reductions can, in some instances, increase ambient ozone levels.<sup>63</sup>
- Requiring oil companies to increase oxygen levels in gasoline may reduce carbon monoxide emissions—at least until automakers are required to install emission-control systems that provide the same benefit—but it may also encourage the use of a fuel additive (methyl ter-

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<sup>60</sup> See generally Frank B. Cross, *Paradoxical Perils of the Precautionary Principle*, 53 WASH. & LEE L. REV. 851(1996) (discussing risk-risk trade-offs) [hereinafter Cross, *Paradoxical Perils*]; John Copeland Nagle, *Green Harms of Green Projects*, 27 NOTRE DAME J.L. ETHICS & PUB. POL'Y 59 (2013) (discussing environmental harms from environmental policies).

<sup>61</sup> See Amara Brook et al., *Landowners' Responses to an Endangered Species Act Listing and Implications for Encouraging Conservation*, 17 CONSERVATION BIOLOGY 1638 (2003); Dean Lueck & Jeffrey Michael, *Preemptive Habitat Destruction Under the Endangered Species Act*, 46 J.L. & ECON. 27 (2003); Daowei Zhang, *Endangered Species and Timber Harvesting: The Case of Red-Cockaded Woodpeckers*, 32 ECON. INQ. 150 (2004); Daowei Zhang & Warren A. Flick, *Sticks, Carrots, and Reforestation Investment*, 77 LAND ECON. 443, 445 (2001); see also Jonathan H. Adler, *Money or Nothing: The Adverse Environmental Consequences of Uncompensated Land-Use Controls*, 49 B.C. L. REV. 301 (2008).

<sup>62</sup> See Cross, *Paradoxical Perils*, *supra* note 60, at 875-76.

<sup>63</sup> See, e.g., COMM. ON TROPOSPHERIC OZONE FORMATION AND MEASUREMENT, NAT'L RESEARCH COUNCIL, *RETHINKING THE OZONE PROBLEM IN URBAN AND REGIONAL AIR POLLUTION* 11 (1992), available at <http://books.nap.edu/books/0309046319/html/index.html> ("NO<sub>x</sub> [nitrogen oxide] reductions can have either a beneficial or detrimental effect on ozone concentrations, depending on the locations and emissions rates of VOC [volatile organic compound] and NO<sub>x</sub> sources in a region.").

tiary-butyl ether, a.k.a. MTBE) that causes substantial groundwater pollution throughout the United States.<sup>64</sup>

- Requiring the use of ethanol in gasoline may, by some account, reduce the life-cycle carbon intensity of transportation fuels, but may also increase pressures on fresh water supplies, encourage the displacement of waterfowl habitat, and increase food prices.<sup>65</sup>

If it were not difficult enough to anticipate the ecological effects of human activities, including environmental measures, it is also necessary to anticipate how such measures will influence human activity, and how such activity feeds back into the system and generates additional environmental effects. Fully accounting for all this information so as to predict the likely consequences of regulatory interventions is tremendously difficult.

Environmental policy also often proceeds as if the answers to many questions are purely scientific.<sup>66</sup> Yet the lack of a true environmental nature—of a natural state of the environment that would exist through time were it not for human interference—means that environmental management necessarily involves making choices about what sort of environmental resources and amenities should be protected, preserved, enhanced, or conserved. Further, as Botkin notes, “choosing what to do is not a search for the single ‘true’ condition of nature. Rather it is a design problem.”<sup>67</sup> Environmental management decisions necessarily involve trade-offs, and often these trade-offs are between incommensurable things. Should there be more wolves in Yellowstone National Park, or more elk? More elk or more Aspen trees? As Cronon notes, “we face the dilemma of deciding whether to clean up waste dumps even if doing so might endanger the creatures that now make their homes there.”<sup>68</sup>

The existence of such trade-offs does not mean that there are no “right” answers. Normative disagreement remains possible. The implication is only that we cannot resolve such debates by resorting to what is

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<sup>64</sup> See generally U.S. GEN. ACCOUNTING OFFICE, GAO-02-753T, ENVIRONMENTAL PROTECTION: MTBE CONTAMINATION FROM UNDERGROUND STORAGE TANKS (2002) (reporting that a majority of states have found MTBE in groundwater).

<sup>65</sup> See Dina Cappiello & Matt Apuzzo, *Ethanol Investigation: The Secret Dirty Cost of Obama’s Green Power Push*, THE HUFFINGTON POST (Nov. 12, 2013, 5:34 AM), [http://www.huffingtonpost.com/2013/11/12/ethanol-investigation\\_n\\_4258796.html](http://www.huffingtonpost.com/2013/11/12/ethanol-investigation_n_4258796.html) (Associated Press investigative report on consequences of ethanol mandates subsidies); Kenneth P. Green, *Ethanol and the Environment*, AEI ENERGY & ENV’T OUTLOOK, July 29, 2008, at 1, available at <https://www.aei.org/publication/ethanol-and-the-environment/> (survey of research on environmental impacts of ethanol).

<sup>66</sup> See Tarlock, *supra* note 17, at 1133 (“[T]he questions are framed as scientific questions when they are actually scientifically informed value judgments.”).

<sup>67</sup> BOTKIN, DISCORDANT HARMONIES RECONSIDERED, *supra* note 11, at 328.

<sup>68</sup> Cronon, *Introduction*, *supra* note 23, at 28.

“natural” or dictated by science.<sup>69</sup> While scientific and technical expertise may—indeed, must—inform environmental decision-making, it cannot tell us what to do. Ecological research may help us identify the likely consequences of one course of action or another, and help to document the effects of such decisions after they have been made, but it cannot substitute for the inherently value-based decisions that must be made about how environmental policy should proceed. And if such decisions are to be made through a relatively centralized administrative apparatus—as most environmental policy decisions are made today—then environmental management will be political management.

### III. ADAPTIVE MANAGEMENT

One response to the contemporary ecological understanding is the adoption of “adaptive management.” Though much discussed, it is still relatively underutilized in environmental management.<sup>70</sup> Although some federal agencies have sought to implement some forms of adaptive management—or what some might call “adaptive management-lite”<sup>71</sup>—there is not much to show for it; “its implementation has failed more often than not.”<sup>72</sup> As Professors Craig and Ruhl report, “Putting adaptive management into practice has proven far more difficult than its early theorists expected.”<sup>73</sup>

Different commentators have put forward slightly different formulations of what adaptive management requires, but there are some common threads. According to Professor Ruhl, “The essence of adaptive management theory is an iterative, incremental, decision-making process built around a continuous flow of monitoring the effects of decisions and adjusting decisions accordingly.”<sup>74</sup> The National Research Council fleshed out what adaptive management requires:

The concept of adaptive management promotes the notion that management policies should be flexible and should incorporate new information as it becomes available. New management actions should build upon the results of previous experiments in an iterative process. It

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<sup>69</sup> On the pervasiveness of efforts to present normative policy questions as matters of science, and the effects on the use of science in the policy-making process, see generally ROGER A. PIELKE, JR., *THE HONEST BROKER: MAKING SENSE OF SCIENCE IN POLICY AND POLITICS* (2003).

<sup>70</sup> Craig R. Allen et al., *Adaptive Management for a Turbulent Future*, 92 J. ENVTL. MGMT. 1339, 1339 (2011) (“[Adaptive management] has been and continues to remain relatively little practiced and much misunderstood.”).

<sup>71</sup> J.B. Ruhl & Robert L. Fischman, *Adaptive Management in the Courts*, 95 MINN. L. REV. 424, 441 (2010) (discussing “a/m-lite”).

<sup>72</sup> Arnold & Gunderson, *supra* 7, at 1380.

<sup>73</sup> Craig & Ruhl, *Designing Admin. Law*, *supra* note 9, at 9.

<sup>74</sup> J.B. Ruhl, *Panarchy and the Law*, 17 *ECOLOGY & SOCIETY* 31, 32 (2012).

stresses the continuous use of scientific information and monitoring to help organizations and policies change appropriately to achieve specific environmental and social objectives.<sup>75</sup>

Adaptive management requires agencies to emphasize the discovery and acquisition of information through ongoing monitoring and evaluation of existing management decisions against a reliable metric that can be fed back through the policy-making and management process so that mid-course corrections can be made, and then made again as information and circumstances require.<sup>76</sup> In this sense, adaptive management also favors ongoing environmental assessments over *ex ante*, predictive examinations of expected environmental impacts, such as those required under the National Environmental Policy Act (NEPA).<sup>77</sup> Whereas the NEPA process operates under the tacit assumption that an agency can, with enough effort, identify all relevant information about the environmental consequences of a potential course of action *before* that action is undertaken, adaptive management recognizes that much relevant information will not be known until after management decisions have been made and things are underway. Thus adaptive management calls for regular reevaluation and adjustment to account for what has been learned.<sup>78</sup>

Adaptive management approaches cannot be static. Rather, they must evolve in response to new information and experience. As Professor Tarlock notes, “Adaptive management . . . is premised on the assumption that management strategies should change in response to new scientific information. All resource management is an ongoing experiment.”<sup>79</sup> Yet adaptive management is more than simple trial and error or contingency planning.<sup>80</sup> It requires a meaningfully structured process that ensures iterative consideration of the problem to be solved, measurements of success at solv-

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<sup>75</sup> See Ruhl, *supra* 46, note 14, at 28-29 n.14 (quoting COMM’N ON MO. RIVER ECOSYSTEM SCI., WATER SCI. & TECH. BD., DIV. ON EARTH & LIFE STUDIES, NAT’L RESEARCH COUNCIL, THE MISSOURI RIVER ECOSYSTEM: EXPLORING THE PROSPECTS FOR RECOVERY 18-19 (2002)).

<sup>76</sup> Craig & Ruhl, *Designing Admin. Law*, *supra* note 9, at 17 (“Under a dynamic model of ecosystems . . . management policy must put a premium on collecting information, establishing measurements of success, monitoring outcomes, using new information to adjust existing approaches, and being willing to change.”).

<sup>77</sup> See Bradley C. Karkkainen, *Panarchy and Adaptive Change: Around the Loop and Back Again*, 7 MINN. J.L. SCI. & TECH. 59, 60 (2005) (citing ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT 133 (C.S. Holling ed., 1978)).

<sup>78</sup> Holly Doremus, *Adaptive Management, the Endangered Species Act, and the Institutional Challenges of “New Age” Environmental Protection*, 41 WASHBURN L.J. 50, 55 (2001) [Hereinafter Doremus, *Adaptive Management*] (“A management program cannot be adaptive unless decisions are always subject to re-evaluation in light of new information.”).

<sup>79</sup> Tarlock, *supra* note 17, at 1139.

<sup>80</sup> Craig & Ruhl, *Designing Admin. Law*, *supra* note 9, at 18.

ing the problem, evaluation of existing measures, and modification of ongoing measures in response to new information and discovery.<sup>81</sup>

Although adaptive management seems quite alien to how most government agencies operate most of the time, it is not all that new. As Professor Ruhl comments, “nothing about this is startlingly new or unusual as a general means of decisionmaking—businesses implement adaptive management all the time, or they perish.”<sup>82</sup> Successful firms in competitive industries routinely adapt to changing market conditions and new information, lest they fall behind their competition. What is new is expecting administrative agencies to behave in this fashion, at least in those contexts in which adaptive management is possible and desirable. Applied in this context, it is somewhat revolutionary, but it is also necessary. As Professors Craig and Ruhl advise: “[A]daptive management is not a panacea for the administrative state, yet it is difficult to conceive how regulation can function effectively in the future without making true adaptive management available to agencies in contexts where it is likely to be useful.”<sup>83</sup> Unlike private firms that may adopt adaptive management techniques in order to maintain or enhance their position in a competitive marketplace, government agencies have little incentive to innovate or adapt in response to a changing environment, as their survival does not depend upon it.

#### IV. CONSTRAINTS AND OPPORTUNITIES

There are opportunities to improve the adaptive and responsive nature of environmental protection efforts in the United States, but such opportunities are inherently limited so long as environmental protection is dominated by a relatively centralized, top-down administrative structure. Conventional regulatory and administrative systems are not particularly adaptive or responsive to changing environmental conditions, or even to changed understanding of environmental needs. Bureaucratic systems change slowly and are rarely forward looking. This is due, in part, to legal constraints, but also due to the nature of monopolistic bureaucratic systems, and the inherent information limitations that hamper the ability of such systems to acquire and account for relevant information—let alone to encourage the discovery of such information in the first place. Bureaucratic structures are resistant to change, and this is particularly true where such resistance poses

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<sup>81</sup> Craig R. Allen & Lance H. Gunderson, *Pathology and Failure in the Design and Implementation of Adaptive Management*, 92 J. ENVTL. MGMT. 1379, 1379 (2011) (“Adaptive management uses management actions as experiments to provide data supporting, or failing to support, competing hypotheses when there is uncertainty regarding the response of ecological systems to management activities, to better meet management objectives over time.”).

<sup>82</sup> Ruhl, *supra* note 46, at 30.

<sup>83</sup> Craig & Ruhl, *Designing Admin. Law*, *supra* note 9, at 15.

few risks. Regulatory agencies do not go out of business when they fail to adapt. To the contrary, a failing agency is more likely to see a budget increase than it is to close its doors. The feedback mechanisms that force private firms to be adaptive and responsive to changing market conditions are largely absent from the administrative state.

If adaptive management is to be successful, there must be careful consideration of how to integrate it into the modern administrative state. While many have advocated greater reliance upon adaptive management, “very few commentators from science or law are asking whether it can succeed in the conventional administrative law system.”<sup>84</sup> Those that have considered such questions are often quite skeptical that adaptive management can be grafted onto existing agency processes to any meaningful degree. The obstacles are both practical and political. “Institutional structures and arrangements, in particular, have repeatedly been fingered as key impediments to realizing the promise of adaptive management,” observes Professor Doremus.<sup>85</sup> Yet so are the practical political realities that substantial change in agency operations will threaten the balance of interest group power and potentially deprive some groups of their ability to influence environmental policy decisions. In some manifestations, efforts to adopt adaptive management could even chafe against constitutional constraints.

What follows is a partial list and exploration of some of the obstacles to the adoption of adaptive management in federal environmental policy and potential reform opportunities worthy of further exploration.

#### A. *Resource Constraints*

Environmental agencies face substantial resource constraints. Existing environmental laws impose more obligations on environmental agencies than Congress appropriates the funds to carry out. Neither the money nor person-hours exist to do what Congress has called upon these agencies to do.

Adaptive management, with its requirement of iterative evaluation and course correction, is far more resource intensive than conventional, top down regulatory strategies. Where agencies have sought to adopt adaptive management, even what some would consider “adaptive management lite,” they have chafed against the additional demands this approach places upon agency resources, in particular the “additional burdens of monitoring and evaluation.”<sup>86</sup> Unless the legislative authorization of adaptive management is accompanied by an increase in resources, it is unlikely that many agencies will rush to implement such approaches, at least not in any meaningful

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<sup>84</sup> Ruhl, *supra* note 46, at 31 n.21.

<sup>85</sup> Doremus, *Adaptive Management*, *supra* note 78, at 54.

<sup>86</sup> Profeta, *supra* note 15, at 93.

respect. Agencies may well use the mantra of adaptive management to justify a greater degree of discretion where desired, but it takes far more than the embrace of agency discretion to make adaptive management work.

Adaptive management not only places greater demands on financial and personnel resources, it also demands more information. The knowledge problem has always constrained environmental regulation.<sup>87</sup> Existing environmental laws do a poor job of encouraging the development and discovery of the environmental information, and knowledge upon which successful environmental management depends.<sup>88</sup> Once one acknowledges the dynamic nature of natural systems, this problem is multiplied many times over.<sup>89</sup> If nature cannot be relied upon to guide itself to some ideal, natural state, environmental managers must know even more about the systems they seek to conserve and protect.<sup>90</sup> And yet, “in most areas, we lack even the most basic information on the condition of nature.”<sup>91</sup> Implementing adaptive management, if it is to be effective, will also require an increase in resources devoted to research and information gathering, above and beyond that which is required for the management process itself.

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<sup>87</sup> See Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle*, 14 YALE L. & POL’Y REV. 23, 50 (1996), (“Federal regulators never have been and never will be able to acquire and assimilate the enormous amount of information necessary to make optimal regulatory judgments that reflect the technical requirements of particular locations and pollution sources.”). On the “knowledge problem” see generally F.A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519, 519-20 (1945) (“The problem of economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess.”).

<sup>88</sup> See Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795, 883 (2005) (“Contemporary environmental regulation and natural resource management have been shaped by a legal regime that too often promotes the careful hoarding of information and fails to build in mechanisms for environmental agencies to learn from their actions.”); see also Wendy Wagner, *Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 DUKE L.J. 1619 (2004).

<sup>89</sup> Profeta, *supra* note 15, at 75 ([I]f ecosystems are dynamic, shifting systems, then management with perfect or nearly-perfect information is impossible.”); Freeman & Farber, *supra* note 88, at 888 (“Because knowledge of environmental problems is so dramatically incomplete, and because environmental systems are so dynamic, regulatory and management institutions cannot be static.”).

<sup>90</sup> See BOTKIN, DISCORDANT HARMONIES RECONSIDERED, *supra* note 11, at 337-38.

<sup>91</sup> *Id.* at 338. See also Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130 (2005) [hereinafter Adler, *Jurisdictional Mismatch*]; Daniel B. Botkin, *Adjusting to Nature’s Discordant Harmonies*, 7 DUKE ENVTL. L. & POL’Y F. 25, 35 (1996) (“Whenever I have been asked to examine an environmental problem, I have found that key information is lacking.”). See generally Bradley C. Karkkainen, *Bottlenecks and Baselines: Tackling Information Deficits in Environmental Regulation*, 86 TEX. L. REV. 1409 (2008).

## B. Centralization

A common critique of federal environmental law is that it is unduly centralized, and places too much control in Washington, D.C. While some environmental problems are global in scope, most environmental problems manifest themselves at the local or regional level. Few are “national,” and yet most environmental policy-making occurs at the national level.<sup>92</sup> Federal statutes impose uniform environmental priorities and standards without much regard for regional variation in ecological conditions or local priorities.<sup>93</sup> This mismatch hampers effective environmental protection.<sup>94</sup>

Existing environmental statutes provide relatively little meaningful opportunity for state-level innovation. While most pollution control statutes speak of cooperative federalism and reaffirm the need to respect state-level policymakers, most priority-setting occurs at the federal level. In practice, state-level policymakers have relatively little flexibility in identifying and selecting environmental policy goals and implementing regulations offer states relatively little leeway to experiment. Statutes such as the Clean Air Act and their implementing regulations constrain the ability of states to adopt new approaches, even as they pay lip service to flexibility. State implementation plans, for instance, are evaluated based upon how they fare under the Environmental Protection Agency’s (EPA) modeling, not based upon the extent to which they produce results or satisfy the needs and demands of local citizens.<sup>95</sup>

Federal agencies are also not particularly supportive of state or local efforts to innovate, particularly if such innovation involves taking a different approach than that preferred in Washington, D.C. As a 2002 General Accounting Office report found, states faced substantial “cultural resistance” from EPA officials, largely in the form of time- and resource-consuming reviews when they sought to innovate.<sup>96</sup> Although the Clinton Administration made some efforts to facilitate state-level experimentation, these initiatives were never legislatively authorized and were short lived.<sup>97</sup>

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<sup>92</sup> See Adler, *Jurisdictional Mismatch*, *supra* note 91.

<sup>93</sup> Arnold & Gunderson, *supra* note 7, at 10,433 (“Polycentrism is better matches to the scales, scope and speed of problems that legal and governance institutions must address than monocentrism is.”).

<sup>94</sup> See *id.*; Allen et al., *Adaptive Management*, *supra* note 70, at 1343 (“The lack of institutions matched to the appropriate scale is a significant barrier for sound environmental management.”).

<sup>95</sup> Arnold & Gunderson, *supra* note 7, at 10,434.

<sup>96</sup> U.S. GEN. ACCOUNTING OFFICE, GAO-02-268, ENVIRONMENTAL PROTECTION: OVERCOMING OBSTACLES TO INNOVATIVE STATE REGULATORY PROGRAMS 3 (2002).

<sup>97</sup> See, e.g., Thomas E. Caballero, *Project XL: Making It Legal, Making It Work*, 17 STAN. ENVTL. L.J. 399, 401 (1998) (“Despite much fanfare heralding Project XL’s objectives, and despite apparent industry enthusiasm for regulatory flexibility, the program has not produced any significant results.”); Joyce M. Martin & Kristina Kern, *The Seesaw of Environmental Power from EPA to the States: Nation-*

The Bush Administration showed even less interest in facilitating state-level experimentation.<sup>98</sup>

Fostering greater regional or local experimentation with environmental management is one way to encourage adaptive management, while also responding to the ecological variation found throughout the nation. A more decentralized and “polycentric” approach to many environmental problems may help facilitate more adaptive approaches to environmental management.<sup>99</sup> True adaptive management, particularly if it is to lead to the discovery of additional information about natural systems and how they respond to different types of interventions and conservation measures, must be decentralized and, to some degree competitive.

The competitive regulatory dynamic embodied in the federalist system can facilitate the sort of learning by doing that is so often absent from centralized regulatory agencies. Among other things, such approaches allow for more experimentation and innovation, greater risk diversification, and facilitate active learning from the implementation of differing management approaches.<sup>100</sup> Providing states with a formal mechanism through which they could opt out of existing federal environmental requirements could provide the opportunity for experimentation with different approaches to environmental management, including forms of adaptive management.<sup>101</sup> A mechanism could even be a form of adaptive management insofar as it encouraged regular evaluation of the successes and failures of competing management approaches and facilitated iterative learning about how to make environmental measures more successful among competing jurisdictions.

Decentralization to encourage adaptive management could take the form of decentralizing the management of the federal estate. One possibility, which has been tried to a modest degree, would be to provide greater autonomy for individual parks, refuges, or forest units within the federal system so that those managers with the greatest knowledge and experience with the resources in question could experiment with different conservation measures.<sup>102</sup> The National Park Service’s fee demonstration project, while

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*al Environmental Performance Plans*, 9 VILL. ENVTL. L.J. 1, 23-26 (1998) (stressing statutory and regulatory obstacles to innovation under NEPPS).

<sup>98</sup> See Barry Rabe, *Environmental Policy and the Bush Era: The Collision Between the Administrative Presidency and State Experimentation*, 37 PUBLIUS 413 (2007).

<sup>99</sup> Arnold & Gunderson, *supra* note 7, at 10,433-34.

<sup>100</sup> *Id.* at 10,440 (“Legal boundaries to federal regulatory authority may help to stimulate nonfederal or nonregulatory methods of protecting [environmental values] . . .”).

<sup>101</sup> For the outlines of one possible mechanism, see Jonathan H. Adler, *Letting Fifty Flowers Bloom: Using Federalism to Spur Environmental Innovation*, in THE JURISDYNAMICS OF ENVIRONMENTAL PROTECTION: CHANGE AND THE PRAGMATIC VOICE IN ENVIRONMENTAL LAW 263 (Jim Chen ed., 2004). See also DANIEL FARBER, *ECO-PRAGMATISM* 193-98 (1991).

<sup>102</sup> For a discussion of one such experiment, see Joseph Little, Robert P. Berrens & Patricia A. Champ, *Uncharted Territory—the Charter Forest Experiment on the Valles Caldera National Preserve*:

not without controversy, could serve as the basis for this sort of decentralized experimentation with park management.<sup>103</sup> If properly structured, it would help reveal substantial information about how such lands can be managed in economically sound and ecologically desirable ways. There is also reason to suspect that decentralizing land management by placing greater responsibility in the hands of state governments would improve the effectiveness and responsiveness of land managers.<sup>104</sup>

### C. *Statutory Requirements*

Adaptive management, as such, is rarely authorized by statute.<sup>105</sup> As a consequence, adaptive management “has not been seriously incorporated into environmental regulation.”<sup>106</sup> This is a meaningful obstacle to more widespread adoption of adaptive management by environmental agencies. In simple terms, “in order for adaptive management to flourish in administrative agencies, legislatures must empower them to do it.”<sup>107</sup>

Where agencies have sought to adopt adaptive management, they have generally endeavored to do so by exploiting ambiguities in their statutory delegations of authority. Although some agencies may have genuinely tried to implement true adaptive management strategies, they generally lack statutory authority for such reforms.<sup>108</sup> So even if agency heads are willing to make the effort, they face a daunting gauntlet of interest group opposition and judicial scrutiny. According to Professor Ruhl, when the Fish and Wildlife Service (FWS) sought to integrate adaptive management into the habitat conservation plan (HCP) permitting process, interest group litigants and courts were quick to challenge the agency’s authority to incorporate greater flexibility into the program.<sup>109</sup>

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*An Initial Economic and Policy Analysis*, 45 NAT. RESOURCES J. 33 (2005); see also ROBERT NELSON, PUBLIC LANDS, PRIVATE RIGHTS, THE FAILURE OF SCIENTIFIC MANAGEMENT (1995); Sally K. Fairfax, Jon A. Souder & Greta Goldman, *The School Trust Lands: A Fresh Look at Conventional Wisdom*, 22 ENVTL. L. 797, 803 (1992).

<sup>103</sup> See Holly Lippke Fretwell, *Paying to Play: The Fee Demonstration Program*, PERC POLICY SERIES, Dec. 1999, at 1.

<sup>104</sup> See, e.g., Shawn Regan, *The U.S. Department of Land-Hogging*, WALL ST. J. (Apr. 2, 2015), <http://www.wsj.com/articles/shawn-regan-the-u-s-department-of-land-hogging-1428015833>.

<sup>105</sup> Ruhl, *supra* note 46, at 35 (“[O]ne truly searches in vain for legislation that establishes anything like the decisionmaking cycle of adaptive management.”).

<sup>106</sup> Profeta, *supra* note 15, at 86.

<sup>107</sup> Ruhl, *supra* note 46, at 31 (arguing also that interest groups and courts must be willing to allow such reforms to take place).

<sup>108</sup> Profeta, *supra* note 15, at 74 (“[A]gencies have been operating without well-focused statutory authority [in their efforts to incorporate contemporary scientific insights].”).

<sup>109</sup> Ruhl, *supra* note 46, at 32-33. Not all commentators have been as impressed with the measures the FWS sought to adopt under the manta of “adaptive management.” See Karkkainen, *supra* note 77, and accompanying text.

The FWS's desired reforms may have prompted litigation and stoked controversy, but they were hardly an example of aggressive adaptive management. To some, what the FWS considers to be "adaptive management" is little more than "a series of pre-specified contingency measures that will be adopted at pre-specified triggering thresholds if the initial effort fails to produce the expected results."<sup>110</sup> In other words, it is little more than "contingency planning."<sup>111</sup> While it is no doubt preferable to engage in some degree of contingency planning than to blithely assume the accuracy of every predictive assumption upon which a regulatory or other conservation decision was made, this is a far cry from true adaptive management.<sup>112</sup> Thus, Professor Karkkainen concludes, despite lots of statements to the contrary, "FWS may never have really tried to incorporate genuine adaptive management (as the rest of us know it) into the HCP process."<sup>113</sup>

Legislative grants of authority to implement adaptive management schemes are necessary for more federal agencies to begin utilizing such approaches, but they are not sufficient. For agencies to have a meaningful opportunity to adopt adaptive management approaches, Congress must also scale back some of the legislatively created mechanisms that interest groups use to frustrate agency initiatives and pursue agency capture. The combination of expensive procedural requirements, such as those mandated by the Administrative Procedure Act (APA) or specific authorizing statutes, and substantive statutory constraints create a barrier that is hard for all but the most committed agencies to scale.

It is particularly difficult for agencies to promulgate meaningful reforms when any innovative initiative exposes the agency to litigation. Broad citizen-suit standing makes it possible for a wide range of interests to hold up agencies that seek to shift their management approaches. Under cross-cutting statutes, such as NEPA, agencies are required to conduct extensive *ex ante* studies of the likely effects of proposed reforms. Because meaningful predictions are, in a real sense, incompatible with true adaptive management, it will be difficult for many agencies to move forward in this regard while complying with NEPA's requirements. Indeed, interest groups unhappy with the potential results of adaptive management have made such claims in court.<sup>114</sup> While it would be a mistake to reduce agency obligations to consider the environmental effects of their actions, the exist-

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<sup>110</sup> Karkkainen, *supra* note 77, at 71.

<sup>111</sup> *Id.* at 72 (quoting Gregory A. Thomas, *Where Property Rights and Biodiversity Converge Part III: Incorporating Adaptive Management and the Precautionary Principle into HCP Design*, 18 *ENDANGERED SPECIES UPDATE* 32, 33 (2001)).

<sup>112</sup> *Id.* ("[C]ontingency planning' is . . . just a slightly more complex form of 'front-end' decisionmaking . . .").

<sup>113</sup> *Id.* at 74.

<sup>114</sup> See Ruhl, *supra* note 46, at 37-38 (citing *In re Operation of the Mo. River Sys. Litig.*, 363 F. Supp. 2d 1145 (D. Minn. 2004), *aff'd* 421 F.3d 618 (8th Cir. 2005)).

ing NEPA process will make it particularly difficult for agencies to adopt adaptive management across many environmental programs.

#### D. *Administrative Law Norms*

Above and beyond the specific constraints imposed by existing environmental statutes and the APA, dominant norms of administrative law may provide further obstacles to the widespread adoption of adaptive management.<sup>115</sup> Rule of law concerns may be in tension with the demands of adaptive management.<sup>116</sup> Some might even suggest that they are “incompatible.”<sup>117</sup> The requirements for extensive *ex ante* assessment of options and consequences, meaningful public participation, and subsequent judicial review of agency decision-making may make it difficult to adopt true adaptive management approaches to environmental management even if statutorily authorized.<sup>118</sup>

Administrative law generally requires agencies to invest substantial time and effort up front to analyze potential courses of conduct and solicit public participation. Agencies are expected to explain the bases for the decisions they make and the likely expected consequences, and courts stand ready to review the explanations agencies give to ensure that the agencies have complied with their statutory mandates and engaged in “reasoned decisionmaking.” This general approach leaves little room for “learning by doing” or meaningful experimentation.<sup>119</sup>

Whereas adaptive management requires an ongoing iterative process in which managers are evaluating newly revealed information about the consequences of existing measures and adjusting management policies accordingly, administrative law places a premium on finality.<sup>120</sup> This creates a stark conflict. As Professor Tarlock comments, “The idea that all management is an ongoing experiment poses a profound challenge to our legal

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<sup>115</sup> *Id.* at 53 (“[T]ruly adaptive management cannot flourish among regulatory agencies in the conventional administrative law context.”).

<sup>116</sup> See F.A. HAYEK, *THE ROAD TO SERFDOM* 80 (1944) (“[The rule of law requires] that government in all its activities is bound by rules fixed and announced before-hand—rules which make it possible to foresee with fair certainty how the authority will use its coercive powers in given circumstances and to plan one’s individual affairs on the basis of his knowledge.”).

<sup>117</sup> Allen et al., *Adaptive Management*, *supra* note 70, at 1343 (“The adversarial character of administrative law, combined with the need for certainty (e.g., procedural rules) in the larger realm of American law, is likely incompatible with adaptive management.”).

<sup>118</sup> Ruhl, *supra* note 46, at 31 (“[T]here is good reason to doubt whether regulation by adaptive management is possible without substantial change in administrative law.”).

<sup>119</sup> For a discussion of how the current emphasis *ex ante* assessments can inhibit mid- or late-course adjustments to regulatory programs, see Robert L. Glicksman & Sidney A. Shapiro, *Improving Regulation Through Incremental Adjustment*, 52 U. KAN. L. REV. 1 (2004).

<sup>120</sup> Craig & Ruhl, *supra* note 9, at 34-38.

system because it undermines a core principle of procedural and substantive fairness: finality.<sup>121</sup> Adaptive management's emphasis on "feedback loops to update regulatory efforts as information increases"—to adjust the dial in an ongoing basis—"is counterintuitive for the American legal system, which puts a premium on firm rules of law."<sup>122</sup>

Finality serves several purposes in administrative law. For one, it helps to provide a degree of certainty to regulated parties and those who depend upon administrative agencies. The regulatory process has a definitive endpoint, after which all affected may rely upon a duly promulgated rule as binding and secure. This generates a degree of legal certainty. Yet if the administrative law process desires certainty, adaptive management avoids it:

Legal certainty does not mesh well with environmental unpredictability. One of the most significant barriers for managing linked social–ecological systems is that often the aspects of a society that make it free (e.g., certainty of law) are not in concert with ecological realities (e.g., multiple regimes and non-linear systems and responses). The certainty of law and institutional rigidity often limit the experimentation that is necessary for adaptive management.<sup>123</sup>

A system in which agencies were free to recalibrate regulatory obligations would provide little certainty for regulated entities. As Professor Tarlock notes, "the application of adaptive management supported by non-equilibrium ecology undermines settled expectations and increases the risk to those who undertake activities in areas targeted" for ecological protection.<sup>124</sup> Insofar as agencies maintain discretion to alter their decisions, they risk upsetting the expectations of those that have relied upon the agency's decision. And yet, "continuing discretion to alter a decision is *the essence* of adaptive management."<sup>125</sup> This tension, between providing regulated entities with certainty and the need under adaptive management to revisit decisions and make dial adjustments as necessary can be seen in ESA implementation, where the FWS claimed to be working toward an adaptive management approach while simultaneously trying to promise landowners that there would be "no surprises" and that HCP requirements would not change over time.<sup>126</sup>

Insofar as adaptive management relies upon nimble administrative agencies that are able to respond quickly to new information as it emerges, the existing administrative structure is a poor fit. It takes a substantial amount of time for agencies to develop policies to implement statutes, issue

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<sup>121</sup> Tarlock, *supra* note 17, at 1140.

<sup>122</sup> Profeta, *supra* note 15, at 86.

<sup>123</sup> Allen et al., *Adaptive Management*, *supra* note 70, at 1343.

<sup>124</sup> Tarlock, *supra* note 17, at 1141.

<sup>125</sup> Ruhl, *supra* note 46, at 39.

<sup>126</sup> *See id.* at 47–48.

regulations, or develop management plans subject to NEPA or other review requirements.<sup>127</sup> Public participation mandates further increase the time and other resources agencies must devote to substantial initiatives, particularly if agencies are responsive to public comments and make any meaningful effort to adjust their proposal in response to the information and opinions submitted to the agency.<sup>128</sup> The current rulemaking process can be cumbersome and does require a substantial investment of agency time and resources. Agencies that are not careful to ground their policy decisions in the relevant grant of statutory authority and properly respond to adverse public comments can find themselves sent back to square one by reviewing courts.

Yet one should not overstate the extent to which existing procedural requirements prevent agencies from adapting to new information and updating outdated policies. The extent to which administrative law entrenches agency decisions and prevents them from revisiting prior policy decisions in light of new scientific or other evidence is likely overstated.<sup>129</sup> The evidence for regulatory “ossification” is mixed.<sup>130</sup> Agencies may be slow to revise or reconsider prior decisions, but this is not because administrative law prevents them from doing so. The Supreme Court has made clear that insofar as agencies are exercising delegated regulatory authority, they are free to reverse course and adopt new policy agendas, provided they remain within the scope of their delegation.<sup>131</sup>

Professors Craig and Ruhl argue that for adaptive management to be truly successful, and advance beyond the watered-down “adaptive management lite” utilized by some federal agencies, there must be an “alternative administrative procedure model that enables agencies to practice adaptive management in its purer form.”<sup>132</sup> They recognize that this requires a model that departs substantially from the dominant administrative law norms. Among other things, such an administrative procedure model may not provide as much room for public participation, at least not in the form

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<sup>127</sup> See Stuart Shapiro, *Two Months in the Life of the Regulatory State*, 30 ADMIN. & REG. L. NEWS. 12 (2005).

<sup>128</sup> See *id.*

<sup>129</sup> For a discussion of existing statutory provisions that authorize or require “back end” assessments or adjustments, see Glicksman & Shapiro, *supra* note 119.

<sup>130</sup> See, e.g., Cary Coglianese, *The Search for Slowness*, JOTWELL (Apr. 11, 2012), <http://adlaw.jotwell.com/the-search-for-slowness/> (reviewing Jason Webb Yackee & Susan Webb Yackee, *Administrative Procedures and Bureaucratic Performance: Is Federal Rule-making “Ossified”?*, 20 J. PUB. ADMIN. RES. & THEORY 261 (2010)). But see Richard J. Pierce, Jr., *Rulemaking Ossification Is Real: A Response to Testing the Ossification Thesis*, 80 GEO. WASH. L. REV. 1493 (2012).

<sup>131</sup> See *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502 (2009). Agencies are also entitled to some degree of deference in the interpretation of the scope of their delegated authority, insofar as the relevant statutory language is ambiguous. See *City of Arlington v. FCC*, 133 S. Ct. 1863 (2013).

<sup>132</sup> Craig & Ruhl, *supra* note 9, at 12.

utilized now.<sup>133</sup> In addition, agencies will need to forego some degree of *ex ante* examination and predictive assessment in return for greater responsibility to evaluate programs on an ongoing basis, while being committed to engaging in course adjustments as the consequences of various management approaches reveal themselves.

Professors Craig and Ruhl also suggest that adaptive management requires the scaling back of judicial review of agency actions. In their view, judicial review as currently constituted is too “intrusive” on agency decision-making<sup>134</sup> and does not focus on the right criteria, at least as far as adaptive management is concerned. Such an alternative administrative procedure framework may have some promise, although it would likely be quite controversial. Interest groups—environmentalists and industry-based groups alike—will be wary of any reforms that limit their ability to second-guess potentially unfavorable agency decisions.<sup>135</sup> It could also bump up against some serious constitutional constraints on the ways that agencies exercise their delegated authority. To many, judicial review is an essential element of due process within the administrative state.

#### E. *Constitutional Concerns*

To some degree, trying to make the existing administrative regulatory structure flexible and adaptive is like teaching a shark to fly, insofar as it ignores the fundamental nature of the beast. But even if one is more optimistic about the ability, and desirability, of altering such norms and legal requirements, some obstacles remain. This is not merely a question of what we have allowed and come to expect in administrative law. The requirements outlined in the APA were created by Congress, but we should not be so quick to assume that all such requirements, such as for notice and an opportunity to be heard, are merely a function of statute. There are constitutional law norms underlying the basic protections and procedures of the APA. It may well be that “[o]ur conception of responsible rulemaking was developed with an image of static ecosystems,”<sup>136</sup> but some of the norms of administrative law are also the result of underlying constitutional guarantees.

No matter how desirable adaptive management may be, it cannot operate in a vacuum. As Professor Tarlock cautions, insofar as adaptive man-

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<sup>133</sup> *Id.* at 30 (noting potential threat to public participation posed by adaptive management).

<sup>134</sup> *Id.* at 33 (“[T]he very availability of judicial review for each final agency decision is too intrusive, threatening the agencies’ authority and practical ability to adjust adaptive management projects and management measures as they learn without being immediately hauled into court for every little dial adjustment.”).

<sup>135</sup> See Freeman & Farber, *supra* note 88, at 893-94.

<sup>136</sup> Profeta, *supra* note 15, at 95.

agement is adopted by regulatory agencies, “it is public regulation that must satisfy constitutional requirements of substantive and procedural due process.”<sup>137</sup> Granting agencies the authority to engage in true adaptive management “raises the specter of an unchecked branch of government with the power to alter laws anytime it desires.”<sup>138</sup> And this raises due process concerns. Demands for fair notice and a meaningful opportunity to be heard constrain the extent to which agencies may engage in the constant modification and dial tuning that adaptive management may envision.

Apart from the procedural guarantees provided in the APA, the Fifth Amendment to the Constitution provides that life, liberty, and property may not be taken without due process of law. At the time the Fifth Amendment was adopted it was well established that, among other things, due process meant that “the executive could not deprive anyone of a right except as authorized by law, and that to be legitimate, a deprivation of rights had to be preceded by certain procedural protections, characteristic of judicial process.”<sup>139</sup>

Although subjecting private land-use to legislatively authorized permitting requirements is not, in itself, a due process violation or a taking, private landowners are constitutionally entitled to due process in the administration of such a system.<sup>140</sup> Among other things, this means that landowners are entitled to notice of what the system requires and “the opportunity to be heard at a meaningful time and in a meaningful manner” before the government infringes upon a constitutionally protected interest.<sup>141</sup> This further means that if an agency denies a landowner the ability to make productive use of her land, such as by imposing a land-use restriction or denying a permit, the landowner must have some opportunity to make her case. In the context of permitting, this entitles the landowner to some degree of administrative, if not judicial, review at a time that is sufficient to safeguard the landowner’s interests.

In *Sackett v. Environmental Protection Agency*, the EPA had claimed that it could issue a compliance order mandating that landowners restore land they had begun to develop without a Clean Water Act permit.<sup>142</sup> Under the EPA’s interpretation, the landowners could not obtain pre-enforcement review of the EPA’s action. The Court unanimously disagreed. Had the Court accepted the EPA’s interpretation of the Act, however, the Sacketts would have had a colorable Due Process claim against the federal govern-

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<sup>137</sup> Tarlock, *supra* note 17, at 1141.

<sup>138</sup> Profeta, *supra* note 15, at 94.

<sup>139</sup> Nathan S. Chapman & Michael W. McConnell, *Due Process as Separation of Powers*, 121 YALE L.J. 1672, 1679 (2012).

<sup>140</sup> See *Village of Euclid, Ohio v. Ambler Realty Co.*, 272 U.S. 365 (1926).

<sup>141</sup> *Mathews v. Eldridge*, 424 U.S. 319 U.S. 333 (1976) (quoting *Armstrong v. Manzo*, 380 U.S. 545, 552 (1965)).

<sup>142</sup> *Sackett v. EPA*, 132 S. Ct. 1367 (2012).

ment.<sup>143</sup> A system of land-use regulation need not deprive a landowner of all productive use in order for it to constitute a deprivation of property for due process purposes. In *Connecticut v. Doehr*, for example, the Supreme Court explained that “even the temporary or partial impairments to property rights that attachments, liens, and similar encumbrances entail are sufficient to merit due process protection.”<sup>144</sup> Thus agency decisions that substantially encumber private lands may implicate the Due Process Clause.

Notice is an essential element of due process. Legal obligations and prohibitions must be sufficiently intelligible and clear so that a diligent landowner could be aware of the legal rules to which she is bound. A statute—or regulation for that matter—that defines obligations or prohibitions “in terms so vague that men of common intelligence must necessarily guess at its meaning and differ as to its application, violates the first essential of due process of law.”<sup>145</sup> As the Supreme Court explained as recently in 2012, it is a “fundamental principle” that “laws which regulate persons or entities must give fair notice of conduct that is forbidden or required.”<sup>146</sup> Further, “clarity in regulation is essential to the protections provided by the Due Process Clause of the Fifth Amendment.”<sup>147</sup> Although due process challenges to federal regulation are relatively rare, lower courts have reaffirmed the importance of notice in this context. The U.S. Court of Appeals for the D.C. Circuit, for example, concluded that the principles of due process also cautions against “validating the application of a regulation that fails to give fair warning of the conduct it prohibits or requires.”<sup>148</sup>

Statutory reforms that authorize agencies to sidestep the APA’s procedural requirements would not necessarily insulate agency actions from constitutional challenges. Insofar as agencies are authorized to alter regulatory burdens placed upon private lands or otherwise change regulatory requirements in response to emerging information, they may be required to provide some amount of process to regulated parties.

Due process concerns about adaptive management are greatest where federal agencies are engaged in the regulation of private land or the imposition of restrictions that directly affect private rights, including some rights on federal lands. Adopting adaptive management policies and techniques is far less problematic in the context of managing government lands than where environmental management decisions encroach upon private inter-

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<sup>143</sup> See Jonathan H. Adler, *Wetlands, Property Rights, and the Due Process Deficit in Environmental Law*, 12 CATO SUP. CT. REV. 139 (2012); see also *TVA v. Whitman*, 336 F.3d 1236 (11th Cir. 2003).

<sup>144</sup> *Connecticut v. Doehr*, 501 U.S. 1, 12 (1991). On this basis, lower courts have concluded that nonpossessory attachments are deprivations of property for due process purposes. See, e.g., *Pinsky v. Duncan*, 898 F.2d 852 (2d Cir. 1990).

<sup>145</sup> *Connally v. Gen. Contr. Co.* 269 U.S. 385, 391 (1926).

<sup>146</sup> *FCC v. Fox Television Stations, Inc.*, 132 S. Ct. 2307, 2317 (2012).

<sup>147</sup> *Id.*

<sup>148</sup> *Gen. Elec. Co. v. EPA*, 53 F.3d 1324, 1328 (D.C. Cir. 1995) (quoting *Gates & Fox Co. v. OSHRC*, 790 F.2d 154, 156 (D.C. Cir. 1986)).

ests or risk infringing upon private property rights. While there may be political obstacles, including interest group resistance, to reducing the procedural obligations of agencies engaged in resource management decisions, there are less likely to be judicially cognizable property interests of the sort that could implicate Due Process concerns.<sup>149</sup>

Constitutional constraints on the adoption of adaptive management where the regulation of private land-use or disposition of private resources are concerned are largely, if not wholly, absent in the context of federally owned resources.<sup>150</sup> Under current law, statutes like NEPA grant outside groups extensive opportunities to influence and object to resource management decisions. Such procedural rights are purely a creation of statute, and could be legislatively revised or even repealed. So long as federally owned and managed resources are at issue, whether or not to facilitate this degree of public participation and judicial review of agency decisions is a matter of policy to be determined by the legislature. There is no constitutional requirement that citizen groups have more input to such resource management decisions than is provided for within the political process. As a consequence, it would be easier to implement a dynamic and adaptive approach to the management of federal lands and federally owned resources than it would be to integrate adaptive management into the regulation of private land use under existing environmental laws.

#### F. *Market Participation*

It is a mistake to think that the emergence of a dynamic view of natural systems is the first time the administrative state has had to confront complexity.<sup>151</sup> Markets, and the private ordering that spontaneously emerges where property rights are defined and voluntary exchange is possible, exhibit all the features of complex, dynamic adaptive systems. Government agencies may have more success at implementing adaptive management strategies, and avoiding some of the aforementioned constraints, insofar as they seek to advance environmental goals as market participants, and

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<sup>149</sup> Whether private interests in public lands or government-managed resources are entitled to Due Process protections under the Fifth or Fourteenth Amendment would be a context-specific inquiry. In some cases, courts have recognized that permits or other private interests in federally managed resources are property interests for Constitutional purposes. *See, e.g., Foss v. Nat'l Marine Fisheries Serv.*, 161 F.3d 584 (9th Cir. 1998) (holding that fishery participants had judicially cognizable property interest in right to fishery permit for purposes of the Fifth Amendment's Due Process clause).

<sup>150</sup> Of course there are some contexts in which the two may be intertwined, such as where resources are privately owned within the federal estate, or where there are privately held use rights and the like that are recognized as property interests for due process purposes.

<sup>151</sup> *See, e.g., Profeta, supra* note 15, at 95 ("These predispositions of the law were developed before vast complexity was an issue.").

through the adoption of collaborative, contractual, or voluntary initiatives.<sup>152</sup>

As commentators regularly note, many private entities adopt adaptive management techniques of one sort or another. More broadly, the private marketplace acts as a form of adaptive management as different firms try to innovate and meet market demands in different ways, learning from the successes and failures of other. There is no reason, in principle, why a government-owned entity cannot operate in a like fashion, trying new management approaches, learning from its own mistakes, and replicating the successful innovations of others.<sup>153</sup> The question is whether the relevant administrative rules and laws will allow such flexibility and the necessary freedom from political and judicial oversight than can hamstring such efforts.

One possible response to the belated recognition that natural systems are dynamic, complex, adaptive systems would be to rethink the dominant reliance upon regulation as the means for safeguarding environmental values. Where government acts not as a regulator but as a participant in a complex, dynamic and adaptive system—the marketplace—it is both more nimble and less hemmed in by constitutional constraints.

The federal government has substantial ability to intervene directly in markets through the purchase of resources and contracting with private owners and indirectly by providing incentives for market actors to give greater consideration of particular concerns. Such non-regulatory strategies may not suffer from some of the same legal constraints as regulatory strategies. Much as the management of federally-owned resources does not implicate constitutional concerns to the same extent as the management or regulation of resources continued or dependent upon private land, non-regulatory measures may be more amenable to adaptive management strategies.

Some federal agencies already operate programs that could readily become more adaptive in their operation.<sup>154</sup> The Department of Agriculture, for instance, acquires temporary easements for the purpose of protecting waterfowl and their habitat. Purchasing such easements through voluntary transactions raises no due process concerns. Even forced sales, through eminent domain, raise fewer due process concerns than regulatory impositions on private lands. The temporary, yet renewable, nature of the easements acquired under some programs also facilitates regular reevaluation and necessary course corrections in response to changing conditions and new information. The use of these sorts of contractual measures to address

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<sup>152</sup> See generally Freeman & Farber, *supra* note 88, at 881 (noting the potential of “agreement-based regulation” and how such approaches avoid the constraints imposed by the APA).

<sup>153</sup> See *id.* at 800 (noting the potential of “modular” environmental approaches to adopt an “iterative process, evolving over time and adjusting to new information.”).

<sup>154</sup> See generally Adler, *supra* note 61 (discussing non-regulatory conservation programs).

environmental concerns holds substantial promise and has been underexplored to date, particularly insofar as it could contribute to or facilitate adaptive management of environmental resources.

#### CONCLUSION

The demand for complex, adaptive approaches to environmental protection was generated by a revolution in our understanding of the natural world, and environmental systems in particular. Perhaps notions of environmental management and, in particular, the role of government in advancing environmental values needs to undergo a revolution as well. Particularly insofar as one concludes that the conventional administrative, regulatory model of environmental protection is incompatible with the demands of dynamic environmentalism, it may be worth reconsidering whether such a model continues to be the best way forward for environmental protection. Whether it was ever the best model to adopt, it may have outlived its usefulness. “Only political will and our basic perspective prevent us from moving constructively” toward sounder environmental policy, commented Botkin in 1990.<sup>155</sup> This remains true today.

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<sup>155</sup> BOTKIN, DISCORDANT HARMONIES, *supra* note 8, at 13.



## DYNAMIC ECOLOGY AND DYNAMIC ECONOMICS: THE FOUNDATION OF AUSTRIAN ENVIRONMENTAL ECONOMICS

*Terry L. Anderson\**

### INTRODUCTION

Analyzing nature and economies as static systems tending toward equilibrium distracts our attention from the dynamic forces in both. In the case of nature, ecologists increasingly recognize that there is no “state of nature” which would exist in the absence of humans or to which nature would return if left alone by humans.<sup>1</sup> Whether it is cosmic or geological forces that would alter the Earth’s resources—air, water, land, flora, and fauna—or Darwinian evolutionary forces, nature is in a continual state of flux. Similarly, there is no market equilibrium because markets are an amalgamation of human action dependent on subjective valuation of demand and opportunity costs.<sup>2</sup> Both of these are also continually changing along with the particular circumstance of time and place.

Unfortunately, economics, in general, and environmental economics, in particular, are saddled with static models that lead to static legal and policy implications.<sup>3</sup> To be sure, such models provide useful predictions of tendencies toward competitive forces that tend toward equilibrium, even if those models do not tell us much about the harmonization process.

Just as equilibrium market models oversimplify and ignore the important dynamic forces of entrepreneurship, environmental models have oversimplified ecological systems and ignored the importance of dynamic organisms. They build on a balance of nature perspective rather than on ecosystems that are continually confronting and generating new constraints and adjusting to those constraints. As with economic models, ecological models based on carrying capacity may give some idea of tendencies toward a steady state, but because the ecological *ceteris paribus* conditions

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<sup>1</sup> See DANIEL A. BOTKIN, *DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY* (1990) [hereinafter BOTKIN, *DISCORDANT HARMONIES*].

<sup>2</sup> For a concise discussion of the fundamentals of Austrian economics, see Peter J. Boettke, *The Concise Encyclopedia of Economics: Austrian School of Economics*, LIBRARY OF ECON. & LIBERTY (2008), <http://www.econlib.org/library/Enc/AustrianSchoolofEconomics.html>.

<sup>3</sup> For an example of how prevalent static equilibrium theory is in natural resource economics, see the popular textbook TOM TIETENBERG & LYNN LEWIS, *ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS* (2011).

are continually changing, there is no steady state or no state of nature. In the words of ecologist Daniel Botkin:

We have tended to view nature as a digital camera's ["Kodachrome" in earlier versions] still life, much like a tourist-guide illustration of La Salute; but nature with and without people is and always has been a moving-picture show, much like the continually changing and complex patterns of the water in the Venetian lagoon.<sup>4</sup>

Botkin asks, "How real is the concept of a balance of Nature? What is the connection between people and nature? What are our roles in and obligations to nature . . . ?"<sup>5</sup>

As with ecologists, economists must ask similar questions. Given that markets are never in equilibrium, economists need to focus on dynamic processes in both nature and markets, and on the links between human action and nature. Those links are determined by property rights—the rules of the game—that determine who has the right to decide how resources are used and who derives value therefrom. If, at a point in time, property rights are clearly defined and enforced, then the roles and obligation of human beings to one another as users of nature will account for the human values and natural conditions at that time.<sup>6</sup>

As values and environmental conditions change, however, dynamic forces come into play, disrupting the status quo property rights and creating incentives to change those rights.<sup>7</sup> Once abundant resources become scarce, individuals with different values will compete for uses, necessitating reallocation among those competing uses.<sup>8</sup> Effective environmental entrepreneurship, therefore, is akin to Darwinian evolution in economies. As Matt

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<sup>4</sup> DANIEL A. BOTKIN, *THE MOON IN A NAUTILUS SHELL: DISCORDANT HARMONIES RECONSIDERED* 8 (2012); BOTKIN, *supra* note 1, at 6.

<sup>5</sup> BOTKIN, *supra* note 4, at 18.

<sup>6</sup> Throughout this paper, the terms "natural resources" and "the environment" are used interchangeably, but it is important to keep in mind that entrepreneurs take actions regarding specific natural resources, such as trees, water, air, and so on, rather than some general, amorphous concept of the environment. In a sense, for the entrepreneur, there is no such thing as the environment. What we call the environment is an amalgam of individual natural resources to which property rights may or may not be defined. If there are property rights to a resource, the entrepreneur will account for its value. If there are not, he will either capture the value in a scramble for ownership via first possession or engage in establishing property rights.

<sup>7</sup> This analysis may seem unduly anthropocentric because it presumes that humans hold property rights over nature. Some legal scholars, for example, have argued that flora, fauna, and even inanimate objects have rights, but accepting this, those rights can only be expressed by humans making claims for things in nature. Christopher D. Stone, *Should Trees have Standing—Toward Legal Rights for Natural Objects*, 45 S. CAL. L. REV. 450, 480 (1972). Therefore all rights boil down to human rights, even if those rights are expressing an intrinsic value of nature.

<sup>8</sup> See generally, Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).

Ridley puts it, markets are “spontaneously self-ordered through the actions of individuals, rather than ordained by a monarch or a parliament.”<sup>9</sup>

In summary, this paper argues that instead of focusing on equilibrium conditions in markets or nature, more emphasis needs to be put on the dynamic processes that provide a link between markets and the environment by emphasizing that 1) environmental problems result from a lack of clear property rights; 2) property rights problems are entrepreneurial opportunities; and 3) entrepreneurs respond to and create market signals in the form of prices, which reflect environmental conditions. The effectiveness of markets in providing a link between humans and their natural environment depends on how well the property rights induce owners to account for changing human values and changing states of nature.

The actor in this dynamic process is the entrepreneur who observes changing human values and changing states of nature and who see opportunities in coordinating between the two. The challenge for the entrepreneur is to discover the values of goods, services and the inputs that go into their production and to capture those values through market exchanges of ownership claims to labor, capital, and natural resources (the environment).

When an entrepreneur successfully responds to disequilibrium conditions created by changing human values or by changing ecosystems, he or she is responding to resolve what Daniel Botkin calls “discordant harmonies.”<sup>10</sup> Just as ecological disturbances create discordance in the environment to which species respond by filling niches and evolving, economic disturbances create discordance in markets to which entrepreneurs respond. If they are successful, they tend to create harmony from dissonance.

## I. AUSTRIAN ECONOMICS AND ECOLOGY

Economists have traditionally analyzed markets using comparative statics, comparing one equilibrium with another and specifying the conditions for the equilibrium to hold. The assumptions of perfect information, costless market transactions, and perfect competition focus attention on the equilibrium where price balances the quantity supplied and demanded at a price equal to the marginal cost of production. Austrian economists criticize neoclassical economics on the grounds that it ignores basic Austrian propositions as enunciated by Peter Boettke,<sup>11</sup> and those criticisms are condensed as follows:

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<sup>9</sup> Matt Ridley, *The Natural Order of Things*, THE SPECTATOR, January 10, 2009, at 12, 12.

<sup>10</sup> BOTKIN, DISCORDANT HARMONIES, *supra* note 1.

<sup>11</sup> See Boettke, *supra* note 2.

A. *Only Individuals Choose.*

Environmental economics acknowledges that individuals choose, but it assumes that private actors ignore some costs of their action and therefore engage in more of that action than is socially optimal. Too much fishing of a stock of fish, too many emissions into the air, and too much diversion of water from rivers are examples. The implication is that private action must be curtailed by collective action to achieve socially optimal resource use.

There are two problems with this conclusion. First, environmental economics often fails to consider how collective action works, i.e., public choice. The work of the late Elinor Ostrom has opened the door for greater recognition of communal property rights, but still there is little recognition of the potential for government failure.<sup>12</sup> Second, static models leading to policy recommendations to correct the divergence between private and social costs do not recognize the evolutionary nature of property rights.<sup>13</sup> They fail to recognize that incomplete property rights are opportunities for entrepreneurs who can better define and enforce property rights and thus capture the previously uncaptured rents.

B. *The Study of the Market Order Is Fundamentally About Exchange Behavior and the Institutions Within Which Exchanges Take Place.*

If markets are about exchange, then markets cannot be created by simply setting a price to correct alleged market failure. For example, economists generally agree that low water prices lead to inefficient uses of water and conclude that prices need to be increased. Doing that does not create a market even if it does reduce water consumption. The problem is that there are not well-specified water rights that can be exchanged. Such rights are the institutions on which exchange behavior could be based.

Philosopher Mark Sagoff confronts economists who view markets and ecosystems as equilibrium systems that can be objectively valued for their contributions to human welfare. “Ecological knowledge, like any kind of empirical knowledge that is relevant to economic activity, is too spread out among people and too sensitive to the moment to be captured by any one individual or by any group—even scientists given sufficient resources.”<sup>14</sup> Remarking on recent attempts by economists and scientific experts to as-

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<sup>12</sup> See generally ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* (1990).

<sup>13</sup> See generally Harold Demsetz, *Toward a Theory of Property Rights*, 57 *AM. ECON. REV.* 347 (1967); Terry L. Anderson & Peter J. Hill, *The Evolution of Property Rights: A Study of the American West*, 18 *J.L. & ECON.* 163 (1975).

<sup>14</sup> Mark Sagoff, *The Quantification and Valuation of Ecosystem Services*, 70 *ECOLOGICAL ECON.* 497, 501 (2011).

sign values to ecosystem services from the top down, Sagoff concludes that “[t]he ‘ecosystem services’ project is bound to fail in its attempt to substitute an *in natura* calculus of value for the artifice of market price.”<sup>15</sup> Instead of seeking to value ecosystems, markets aggregate disparate knowledge through entrepreneurial action.

C. *Utility and Costs Are Subjective.*

This point is particularly relevant in environmental economics where benefit–cost analysis is put forward as a substitute for markets and as a basis for making governmental actions mimic markets. Given that demand and supply—utility and costs—are subjective, doing benefit–cost analysis is meaningless when done in the absence of market transactions. If such transactions existed, benefit–cost analysis would be unnecessary; if market transactions are absent, there is no way that benefit–cost analysis can discern what the subjective values are.

D. *The Price System Economizes on the Information That People Need to Process in Making Their Decisions.*

This point made by Hayek is crucial for understanding the nexus between dynamic ecology and dynamic economics.<sup>16</sup> Prices arrived at through market transactions are a reflection of people’s perceptions of scarcity and value. In a world where resource and environmental constraints are continually changing along with the value that people put on the environment, prices provide the necessary information to allow people to respond to dynamic natural and human conditions.

E. *Private Property in the Means of Production is a Necessary Condition for Rational Economic Calculation.*

This gets to the heart of my contention that all environmental problems are property rights problems. Without property rights, people cannot engage in exchange, and without exchange, there is no way of knowing what the subjective values are or knowing how people perceive dynamic changes in their environment. This shifts the focus from what Ronald Coase called “the problem of social cost”<sup>17</sup> to the problem of property rights, which is the essence of what Coase was saying. In other words, property rights force

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<sup>15</sup> *Id.*

<sup>16</sup> See F. A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519 (1945).

<sup>17</sup> Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).

owners to consider the opportunity costs of their decisions. In the environmental context, the owner of oil-bearing lands who says no to drilling faces the cost of saying no. Without transferable property rights, however, it costs nothing to “just say no.”

F. *The Competitive Market Is a Process of Entrepreneurial Discovery.*

Much like the interaction of organisms in nature, the market process emphasizes the interaction of individuals based on factors that are time- and place-specific. Just as individual species fill niches in ecosystems, entrepreneurs find market niches and specialize in production and marketing to fill those niches. Successful entrepreneurship depends on the entrepreneur utilizing local knowledge and resources more efficiently than other individuals. As a result, inefficient resource use in markets and in ecosystems is crowded out in an evolutionary process where sustainability requires profitability for survivability.

In this sense, human action is ordered spontaneously through market processes just as animal and plant speciation is ordered spontaneously through evolutionary processes. Information on which niches are opened and how they should be filled cannot be acquired or ordained from the top down; it requires responses to, what Nobel laureate Friedrich Hayek described as, “rapid adaptation to changes in the particular circumstances of time and place.”<sup>18</sup>

The ability of market institutions to resolve conflicting human demands on natural resources relies on entrepreneurs who reallocate inputs and outputs guided by market prices and property rights. With clear and transferable property rights to all resources, owners will compare the value they place on resources to values of others willing to make offers to buy them. These competing values are imbedded in prices, which provide a condensed form of information about individual preference, resource scarcity, and technology.

The spontaneous orders that emerge in markets require market prices to consolidate and condense diffuse information. As Nobel laureate Friedrich Hayek pointed out many years ago, knowledge in society is dispersed and “not given to anyone in its totality.”<sup>19</sup> Prices communicate decentralized knowledge of the relative scarcity of resources that cannot be comprehended entirely by any individual or group of central planners. Individuals in markets make decisions based on local knowledge and personal preferences, which contribute to the formation of prices. These market prices then transmit knowledge to the rest of society and encourage people to adjust their economic behavior in accordance to changing market circum-

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<sup>18</sup> Hayek, *supra* note 16, at 524.

<sup>19</sup> *Id.* at 520.

stances of which they are not fully aware. In this way, the market process collects decentralized local and time-specific knowledge through the constant fluctuation of market prices to bring about an emergent, but dynamic, order to society. Hayek provides a simple example to illustrate the way in which prices convey dispersed knowledge to coordinate the separate actions of many individuals. Consider a raw material such as tin, which has suddenly become either more limited in supply or more in demand due to changing market circumstances. As Hayek explains, it does not matter which force—decreased supply or increased demand—has made tin more scarce:

All that the users of tin need to know is that some of the tin they used to consume is now more profitably employed elsewhere, and that in consequence they must economize tin. There is no need for the great majority of them even to know where the more urgent need has arisen, or in favor of what other needs they ought to husband the supply. If only some of them know directly of the new demand, and switch resources over to it, and if the people who are aware of the new gap thus created in turn fill it from still other sources, the effect will rapidly spread throughout the whole economic system and influence not only all the uses of tin but also those of its substitutes and the substitutes of these substitutes, the supply of all the things made of tin, and their substitutes, and so on . . . .<sup>20</sup>

According to Hayek, the process of market coordination would occur “without the great majority of those instrumental in bringing about these substitutions knowing anything at all about the original cause of these changes.”<sup>21</sup> The implication is that the problem facing all human societies is not how any one authority or group of experts can direct economic activity as it relates to the use or conservation of resources. Instead, the challenge is for the knowledge that is dispersed throughout society to be conveyed in a way so that individual market actors can adjust their behavior in response to changes of which they could not be fully aware. Hayek referred to this challenge as one of “rapid adaptation to changes in the particular circumstances of time and place,” and viewed the price system as the mechanism for humans to adapt to changing market circumstances.<sup>22</sup>

At their core, markets depend on a dynamic process of entrepreneurial discovery guided by prices. Hayek’s critique of standard economics was that its preoccupation with equilibrium led economists to assume that conditions leading to changes in the supply or demand for resources such as tin were already known by market actors who respond like computers to reestablish equilibrium. Neoclassical economists largely ignored the process by which decentralized knowledge of the relevant changes is conveyed through the price system. Moreover, they overlooked the role of entrepreneurs who respond to changing conditions.

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<sup>20</sup> *Id.* at 526.

<sup>21</sup> *Id.*

<sup>22</sup> *Id.* at 524.

Entrepreneurs act on the disequilibrium inherent in the market process by discovering knowledge not currently represented in market prices and by discovering alternative approaches to adapt to dynamic market conditions. In the process they generate information on the subjective values of individuals as they engage in voluntary trades. According to Hayek, the decentralized decisions made in markets are crucial because “practically every individual has some advantage over all others in that he possesses unique information of which beneficial use might be made, but of which use can be made only if the decisions depending on it are left to him or are made with his active cooperation.”<sup>23</sup> Once we recognize that most knowledge is fragmented and dispersed, then we can understand that, in the words of Thomas Sowell, “systemic coordination among the many supersedes the special wisdom of the few.”<sup>24</sup>

Owners of assets have an incentive to consider their long-term resource values, of course, discounted for time preferences reflected in interest rates. With clearly defined and enforced property rights, the asset owner is a residual claimant<sup>25</sup> with an incentive to collect information about any tradeoffs there are in alternative uses of the asset and value those tradeoffs. He will consider how much it costs to produce a flow of benefits vis-à-vis how much he can gain by selling the flow of benefits. In the context of wolf habitat versus cattle grazing, assuming the two uses are incompatible, the comparison would be between the potential net revenues from wolf habitat and the net revenues from grazing. To the extent that it is difficult to obtain payments from people who derive value from having more wolves, i.e., there is a free rider problem, wolf revenues are likely to be low compared to cattle grazing where revenues are more easily collected. Hence the asset value will be determined by grazing returns over time rather than wolf habitat. If property rights can be redefined to include returns from value of wolf habitat, the owner of potential habitat will have an asset whose value will depend on the higher of the two, wolves or cattle. If he can combine the two, he may find some balance between them, or better yet, find a way to make them complementary. In short, the price of assets for which there are secure property rights provides a subjective measure of dynamic ecological factors. If the property rights are not secure, making them so provides an entrepreneurial opportunity.

Emma Marris summarizes the modern challenges facing environmentalists in the following way: “In a nutshell: Give up romantic notions of a stable Eden, be honest about goals and costs, keep land from mindless de-

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<sup>23</sup> Hayek, *supra* note 16, at 521-22.

<sup>24</sup> THOMAS SOWELL, *A CONFLICT OF VISIONS: IDEOLOGICAL ORIGINS OF POLITICAL STRUGGLES* 46 (Basic Books 2007) (1987).

<sup>25</sup> For a discussion of the importance of residual claimancy, see Armen A. Alchian & Harold Demsetz, *Production, Information Costs, and Economic Organization*, 62 *AM. ECON. REV.* 777 (1972).

velopment, and try just about everything,”<sup>26</sup> This is what entrepreneurs do—try just about everything. In some cases, their decisions will be wrong, but just as poor adaptations in nature are eliminated, albeit slowly, via evolutionary processes, bad decisions in markets are purged by economic losses.

The effectiveness of market processes and entrepreneurship in adapting to changes in nature depends on well-defined, enforced, and transferable property rights to environmental resources. If those rights exist, costs and benefits will be internalized by owners. If they do not, entrepreneurs have an incentive to establish property rights in order to capture the benefits of ownership. The evolution of property rights may come from the bottom up or from a political process that distributes rights.<sup>27</sup> In either case, there is no guarantee that property rights will be complete because the costs of defining and enforcing property rights must always be compared to the benefits. For this reason, incomplete property rights do not necessarily imply market failure.<sup>28</sup>

## II. ENVIROPRENEURSHIP<sup>29</sup>

With clearly defined and enforced property rights, environmental entrepreneurs, “enviropreneurs,” have an incentive to consider all the costs of alternative resource uses and to seek gains from trade through mutually beneficial trades to resolve competing demands for natural resources. When and where this environmental entrepreneurship occurs depends on the value of the environmental assets in question. Until wildlife habitat becomes scarce enough to reduce wildlife populations, there is no need to be concerned about who owns the habitat or how it is used. However, if populations fall in response to habitat loss or people place a higher value on wildlife, new demands emerge for conserving habitat. Entrepreneurial conservation groups have met those demands by writing contracts with habitat owners—Ducks Unlimited has paid farmers to conserve wetlands—and by acquiring property rights in key habitats—the Nature Conservancy has established conservation easements that save habitat.<sup>29</sup>

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<sup>26</sup> EMMA MARRIS, *RAMBUNCTIOUS GARDEN: SAVING NATURE IN A POST-WILD WORLD* 170 (2011).

<sup>27</sup> See TERRY L. ANDERSON & PETER J. HILL, *THE NOT SO WILD, WILD WEST: PROPERTY RIGHTS ON THE FRONTIER* (2004).

<sup>28</sup> See HAROLD DEMSETZ, *Ownership and The Externality Problem*, in *PROPERTY RIGHTS COOPERATION, CONFLICT, AND LAW* (Terry L. Anderson & Fred S. McChesney, eds., Princeton Univ. Press 2003).

<sup>29</sup> One of the best examples of contracting for conservation is the Nature Conservancy’s Pine Butte Preserve in Montana. See TERRY L. ANDERSON & DONALD R. LEAL, *FREE MARKET ENVIRONMENTALISM FOR THE NEXT GENERATION* 40-41 (2015).

Hence, the enviropreneur is, above all, a person or organization who develops innovative contractual arrangements.<sup>30</sup> To do so, enviropreneurs must:

- discover new resources, rebundle rights to resources into new production processes, discover new outputs which can be produced from those resources, or some combination of all;
- measure and monitor the production process, especially regarding the contribution of inputs combined for team production; and
- establish the value created by the new combinations of inputs, by new outputs, or by some combination of both.

Each task focuses on property rights and contracting costs. Where property rights do not exist, the entrepreneur must create them, meaning she must define the boundaries of the property and exclude others from using it. In cases where property rights are already defined and enforced, the challenge for the entrepreneur is to measure and monitor contracts with input owners and buyers of goods and services, which were purchased as a result of entrepreneurial production.

Contracting issues are particularly important for environmental entrepreneurs because many environmental goods and services are subject to the free-rider problem. That is to say, goods such as clean water or air, endangered species preservation, or greenhouse gas reduction can be enjoyed by people who cannot easily be restricted from enjoying the good if they do not pay for it. Once clean air and water are produced, anyone in the vicinity can enjoy it; once endangered species are preserved, people can enjoy a sense of satisfaction out of knowing those species continue to exist; and greenhouse gases reduced in one location can potentially stave off global warming around the world. Environmental entrepreneurs trying to capture rents in producing such goods will be undercompensated for their efforts if they cannot find ways of contracting—privately or collectively through government—with potential free-riding consumers. By bundling a private good, such as housing, with a public good, such as open space in the form of a golf course, environmental entrepreneurs can overcome at least some of the free-rider problem.

### III. POLITICAL ENVIRONMENTALISM

Public choice, which has its roots in Austrian economics, provides at least two reasons to be skeptical about the potential for politics to respond

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<sup>30</sup> See Yoram Barzel, *The Entrepreneur's Reward for Self-Policing*, 25 *ECON. INQUIRY* 103 (1987).

to dynamic environmental conditions. They are self-interest and information costs.<sup>31</sup>

Consider how self-interest interfaces with dynamic ecology. Political approaches to environmental problems begin with a presumption that politicians act in the public interest, utilizing sound science as the basis for decisions and considering both the short- and long-term consequences of decisions. Consider management of public lands.<sup>32</sup> Managers are expected to manage lands for multiple uses by and for people, but they are also accountable for meeting broad environmental standards set by laws such as the Endangered Species Act, the Multiple Use and Sustained Yield Act, and the National Environmental Policy Act.<sup>33</sup> Because neither the tradeoffs between competing uses nor the environmental standards are objective or definitive, managers must make judgment calls. Such judgments are conditioned by politics, budgets, and constituency pressure, to mention a few, all of which may or may not lead to efficiency or environmental quality.

Public choice, however teaches that these incentives must be taken into account in evaluating the actions of politicians and bureaucrats. These incentives result in outcomes that diverge from the public interest as a result of lobbying, log rolling, agency delegation and discretion, executive authority, and litigation. In this political process, benefits are concentrated on special interests while costs are diffused to the general population, and voters remain rationally ignorant, meaning they typically are well informed about narrow issues of concern to them, and ill-informed about broader issues outside their coalition.<sup>34</sup>

A.C. Pigou presaged public choice, noting that “It is not sufficient to contrast the imperfect adjustments of unfettered private enterprise with the best adjustment that economists in their studies can imagine. For we cannot expect that any public authority will attain, or will even whole-heartedly seek, that ideal.”<sup>35</sup> He recognized self-interest in politics, saying that the political solutions depends on

the intellectual competence of the persons who constitute it, the efficacy of the organisation through which their decisions are executed, their personal integrity in the face of bribery and

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<sup>31</sup> See RANDY T. SIMMONS, *BEYOND POLITICS: THE ROOTS OF GOVERNMENT FAILURE* 49-54 (2nd ed., 2011).

<sup>32</sup> See HOLLY L. FRETWELL, *WHO’S MINDING THE FEDERAL ESTATE?* (2009), for an excellent discussion of public land management.

<sup>33</sup> *C.f.* MICHAEL D. BOWES & JOHN V. KRUTILLA, *MULTIPLE-USE MANAGEMENT: THE ECONOMICS OF PUBLIC FORESTLANDS*, 21-22, 34 (1989).

<sup>34</sup> SIMMONS, *supra* note 31, at 52-54.

<sup>35</sup> A.C. PIGOU, *THE ECONOMICS OF WELFARE*, 247-48 (1920); *see also* STEVEN G. MEDEMA, *THE HESITANT HAND: TAMING SELF-INTEREST IN THE HISTORY OF ECONOMIC IDEAS* 54-76 (2009) (thoroughly discussing Pigou’s understanding of political action).

blackmail, their freedom from domination by the privileged class, [and] their ability to resist the pressure of powerful interests or of uninstructed opinion.<sup>36</sup>

Optimal regulation and taxation will always be conditioned by political pressures because “[e]very public official is a potential opportunity for some form of self-interest arrayed against the common interest.”<sup>37</sup>

On the constituent side of politics, voters and taxpayers are rationally ignorant, meaning that they are not well informed on most issues because the costs of being well informed are high relative to the benefits. Only when the costs of political action are concentrated will they be rationally informed.

In the context of dynamic ecology, there is little reason to expect that politicians, bureaucrats, or constituents will take account of dynamic changes, especially if they require considering consequences beyond the political cycle. Biologists Daniel Botkin and David Challinor capture this problem regarding invasive species.

Because humans are relatively short-lived and the time scale of their interest is short. In the short run, . . . an invasion’s results can be negative, causing the extinction of some native species and the increase of others. However, a period of adjustment follows the initial invasion. . . . Over an even longer time, biological evolution will occur to create new species, thus continuing to increase biological diversity. Because of the long time it generally takes for a new species to evolve, humans cannot witness their genesis, but can only record species extinctions.<sup>38</sup>

As noted above, asset prices in markets will take account of benefits and costs, to be sure discounted for people’s time preferences, but politics has no such asset pricing mechanism. To the extent that future values are included in political decisions, the time horizon is likely truncated by the political terms. Given that one legislature cannot bind a future one, the costs and benefits to constituents are also truncated.

Of course, information costs exist for private resource owners, but short political time horizons reduce the incentive to gather information that will account for dynamic changes in the future. Part of the information cost results from having the scientific knowledge for what can be accomplished. Just as an aircraft company must hire aeronautic engineers to determine flight characteristics of an airplane, enviropreneurs or environmental regulators must have scientific knowledge about what can be produced from the natural resource base and about how that base is changing. Making good decisions requires having knowledge about what resources are available, what they can and cannot produce, and what the tradeoffs are among the

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<sup>36</sup> A.C. PIGOU, *ECONOMICS IN PRACTICE: SIX LECTURES ON CURRENT ISSUES* 125 (1935).

<sup>37</sup> PIGOU, *supra* note 35, at 248.

<sup>38</sup> Daniel B. Botkin & David Challinor, *Biological Invasions*, 80 *LE TEMPS STRATEGIQUE* 9 (1998).

various production possibilities. For example, enviropreneurs or environmental regulators need to know how much land is available for wolf habitat; how much land is necessary for viable wolf populations; and what the tradeoffs are between wolf habitat and other land uses.

In addition to scientific knowledge, decision makers must have information about the values people place on alternative natural resource uses and about how those values are changing. Accepting that human values are subjective, obtaining the values requires a process wherein people reveal their subjective preferences. In the marketplace, trade requires that people give up something—the opportunity cost—in order to obtain something else. This tradeoff provides an objective way of measuring subjective values, usually in the form of prices measured by the medium of exchange, e.g., dollars.

Hayek recognized that “[t]he economic problem of society is . . . not merely a problem of how to allocate ‘given resources’ if ‘given’ is taken to mean given to a single mind which deliberately solves the problem set by these ‘data.’”<sup>39</sup> The “use of knowledge in society” requires obtaining information on benefits and costs—information that often is not well known. Prices, generated in markets where people trade well-defined and enforced property rights, produce an objective, even if incomplete, summary of this knowledge.

Political environmentalism is typically agnostic—if not outright hostile—towards economic incentives, profits, and growth. The Endangered Species Act illustrates this perspective: “The Congress finds and declares that various species of fish, wildlife, and plants in the United States have been rendered extinct *as a consequence of economic growth* and development untempered by adequate concern and conservation . . . .”<sup>40</sup> Indeed, to political environmentalists, there is an inescapable tension between economic costs and benefits and environmental quality.

Without prices generated by exchange, politics is the art of providing benefits to one individual or group at the expense of another, wherein those benefiting do not have to compensate those bearing the cost. Little information is gained by asking people what they would be willing to sacrifice to obtain a good, unless they actually have to make the sacrifice. There are the costs of forming coalitions to engage in rent-seeking activities which reflect how much parties are willing to spend for a chance at getting what they want, but, given that costs are diffused, there is no guarantee that the benefits exceed the rent-seeking costs.<sup>41</sup>

Political environmentalism is at the heart of the global warming debate. For the most part, policies begin with the assumption that Earth’s

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<sup>39</sup> Hayek, *supra* note 16, at 519-20.

<sup>40</sup> 16 U.S.C. § 1531 (emphasis added).

<sup>41</sup> See TERRY L. ANDERSON & GARY D. LIBECAP, ENVIRONMENTAL MARKETS: A PROPERTY RIGHTS APPROACH, ch. 5 (2014).

climate is out of balance due to human action and that there is some ideal temperature to which we must return if we are to reestablish that balance. However, Daniel Botkin asked in his testimony to the House Subcommittee on Science, Space, and Technology, “Has it been warming?”<sup>42</sup> His answer:

Yes, we have been living through a warming trend, no doubt about that. The rate of change we are experiencing is also not unprecedented, and the “mystery” of the warming “plateau” simply indicates the inherent complexity of our global biosphere. Change is normal, life on Earth is inherently risky; it always has been. The two [IPCC] reports, however, makes it seem that environmental change is apocalyptic and irreversible. It is not.<sup>43</sup>

Such dynamic thinking is missing in virtually all discussions of climate variation. Instead the “balance of climate” mentality persists, promoting mitigation rather than adaptation.

#### IV. FREE MARKET ENVIRONMENTALISM VERSUS POLITICAL ENVIRONMENTALISM

Political environmentalism tends toward the ideological and the extreme. “We must eliminate water pollution!” manifests itself as the Clean Water Act’s National Pollution Discharge Elimination System.<sup>44</sup> Julia “Butterfly” Hill lived in a California Redwood for 738 days in an effort to prevent Pacific Logging Company from cutting it down.<sup>45</sup> Compromise is not part of the mainstream environmental lexicon.

Enviropreneurs may be equally passionate about conservation, but they depart from the political environmentalists in their willingness and ability to negotiate and their creativity in negotiating to achieve conservation results. Wolf reintroduction was not popular among ranchers when it was first proposed, but Hank Fischer and the Defenders of Wildlife addressed the ranchers’ opposition by assuming financial responsibility for the wolves and agreeing to compensate the ranchers for livestock losses.<sup>46</sup> This approach was unpopular among the political environmentalists who wanted reintroduction without paying any of the costs, simply because reintroduction was the environmentally “right thing to do.” Granted, the wolf reintroduction may well have proceeded without the compensation program, but it likely would have taken longer and been more contentious.

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<sup>42</sup> *Intergovernmental Panel on Climate Change, Hearing Before the Subcomm. on Science, Space, and Technology*, 113th Cong. 2 (2014) (statement of Daniel B. Botkin).

<sup>43</sup> *Id.*

<sup>44</sup> 33 U.S.C. § 1342.

<sup>45</sup> See *Julia Butterfly Hill*, WIKIPEDIA, [http://en.wikipedia.org/wiki/Julia\\_Butterfly\\_Hill](http://en.wikipedia.org/wiki/Julia_Butterfly_Hill) (last visited April 12, 2015).

<sup>46</sup> For a discussion of the wolf reintroduction issue, see ANDERSON & LEAL, *supra* note 29, at 5-6.

The pragmatic, results-oriented nature of environmental entrepreneurship draws its practitioners out of the legislative halls and courtrooms where battles of political environmentalism are fought. For enviropreneurs, the goal is to diffuse or circumvent the environmental “fight” altogether by negotiating voluntary, mutually beneficial conservation agreements that are resilient to legislative repeal and judicial appeal. Rarely do such agreements garner the support of the most vocal and vitriolic extremists on either side of the environmental debate, and rarely do successful enviropreneurs trouble themselves with achieving unanimity.

Enviropreneurs recognize the positive relationship between economic incentives and environmental quality. Whether an enviropreneur is running a for-profit company or a not-for-profit organization, the financial component cannot be ignored. Successful enviropreneurs devise ways to combine sustainability with profitability.

The potential link between dynamic ecology and dynamic economics is illustrated in the debates over climate policy. The 2014 Intergovernmental Panel on Climate Change (IPCC) report, for example, offers some hope for dynamic adaptive thinking. The press release issued before the actual report mentions mitigation only once and adaptation twelve times.

In fact, markets seem to be responding to the prospect of higher temperatures. For example, vintner Matthieu Elzinga moved his vineyard in the Loire Valley of France to an emerging wine region in southern England, a move consistent with scientific predictions that current wine producing areas will decline by 25 to 73 percent by 2050. This prediction prompted the headline *Wine from Wyoming? How Yellowstone and Yukon Will Steal Napa's crown*.<sup>47</sup> John Dickerson, founder of Summit Water Development Group, is putting his money where his mouth is by purchasing and brokering water rights in the American West and Australia in response to his prediction that climate change is causing “the percentage [of water] that is freshwater is getting smaller, [while] the percentage that is salt water is getting larger, and the maldistribution of freshwater is getting much more severe.”<sup>48</sup> In his book, *Windfall: The Booming Business of Global Warming*,<sup>49</sup> McKenzie Funk documents dozens of other business ventures including the development of giant water bags to float fresh water across oceans, the construction of sea walls pioneered by the Dutch to keep the sea at bay, and the planting of a Great Green Wall of trees to stop the advance of the Sahara. Mr. Dickson is an entrepreneur who is digesting climate science and acting on it based on his perception of prices. He believes that water is underpriced compared to what he thinks it will be when others recognize

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<sup>47</sup> Steven E.F. Brown, *Wine from Wyoming? How Yellowstone and Yukon Will Steal Napa's Crown*, S.F. BUS. TIMES (Apr. 9, 2013), <http://www.bizjournals.com/sanfrancisco/blog/2013/04/wine-from-wyoming-how-yellowstone-and.html?page=all>.

<sup>48</sup> MCKENZIE FUNK, *WINDFALL: THE BOOMING BUSINESS OF GLOBAL WARMING* 119 (2014).

<sup>49</sup> See generally *id.*

the maldistribution of the resource.<sup>50</sup> His actions illustrate the interface between dynamic ecology, in this case the earth's climate, and dynamic economics, in this case water markets.

The task for environmental economists is to deemphasize static equilibrium models and better incorporate dynamic market forces reflected in natural resource asset prices into their thinking. The challenge is to test how well entrepreneurial actions reflect dynamic ecological forces, and where they do not, to carefully examine why property rights institutions fail to accurately reflect changing resource scarcity.

## CONCLUSION

Typically, economists think of markets and prices as a way of connecting demanders and suppliers of material goods and services, but they are equally important as a mechanism for connecting human values with the dynamic forces of nature. Prices provide condensed information about human demands, and, if property rights to inputs are clear and transferable, prices provide similar information about the human value of resources in competing uses. When human values for nature's bounty change, entrepreneurs recognize the change and reallocate resources to higher valued uses, profiting in the process. In the context of dynamic ecology, prices speak for Mother Nature.

Entrepreneurship is rewarded for recognizing changes when human demands and nature's supply are in disharmony and for reallocating resources in ways that tend to harmonize the two. Producing more with fewer resources, discovering new sources, and developing technologies that better utilize resources are all tools in the entrepreneur's kit.

In order for dynamic markets to respond to dynamic environments, the right institutions—well-defined, enforced, and transferable property rights—must be in place. If these institutions are lacking, the link between dynamic markets and dynamic ecology is broken. Although such broken links are most often referred to as market failures, in the context of dynamic—Austrian—economics, they are better thought of as entrepreneurial opportunities. If institutional entrepreneurs can overcome the technological, legal, and political transaction costs to facilitate market responses changing human demands and changing natural conditions, they will link dynamic economics and dynamic ecology.

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<sup>50</sup> See Brown, *supra* note 47.

PEOPLE-MADE LAW: SPONTANEOUS ORDER, CHANGE, AND THE  
COMMON LAW

*James L. Huffman\**

I. A COMMON LAW PARABLE

Rivers and streams often serve as property boundaries. That makes sense for several reasons. Property values are generally enhanced by access to water and, under the common law riparian doctrine, only riparian landowners have water rights. By establishing boundaries along streams and rivers, more property owners experience the added value of access to and rights in water. Furthermore, streams and rivers are distinct physical features easily described and located. Absent a comprehensive survey system like that implemented in nineteenth century America, property boundaries are usually described by metes and bounds.<sup>1</sup> In this system, rivers and streams are more reliable than are trees that can be cut down, structures and man-made markers that can be removed, or rocks and other natural objects that can become obscured or simply disappear.

Despite their apparent permanence, streams and rivers are not permanently fixed. They too can move, and not just by human intervention. Most rivers and streams are moving gradually in response to erosion and other natural forces. But occasionally they change their course in an instant as a result of flooding, landslips, or other catastrophic natural events. The question for lawyers is, what happens to a watercourse marked property boundary when a stream or river moves?

Even if people recognized that the rivers and streams marking the boundaries of their property are prone to shift course over time, it would be surprising if they expected that the property boundary would not move with the imperceptible migration of the stream. A major benefit of using a stream as a boundary is its ease of identification over time. If the rule was that the property boundary stays where the stream was when the property

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<sup>1</sup> “[A] ‘metes and bounds’ description . . . identifies the parcel by its shape and limits through various elements including monuments, courses, distances, quantities, and by reference to adjacent boundaries or other instruments and maps.” MARTIN WEINSTEIN, SUMMARY OF AMERICAN LAW 456-57 (1988).

was originally described, boundaries would become increasingly difficult to locate. Owners on one side of a stream would slowly acquire small bits of practically unusable and often inaccessible land on the opposite side. The costs of accounting for changes and maintaining recognizable boundaries would far exceed the value of any land changing hands. So it is not surprising that the common law rule, in the case of what hydrologists call accretion, is that property boundaries move with slowly moving streams.<sup>2</sup>

But what about a property boundary marked by a stream that changes course over a short period of time as a result of landslide, earthquake, flooding or other catastrophic event? Under such circumstances, called avulsion by hydrologists, it is unlikely that the affected property owners would have anticipated the change, and in some cases the area of affected lands would be significant. Although a property could lose its entire water access if the boundary does not shift with the stream, it is also possible, particularly in the case of smaller properties, that loss from avulsion could be a significant portion of the whole and therefore economically crippling. And the benefit of an easily identifiable boundary would remain for many years in the form of the old channel. It would be surprising under those circumstances for people generally to expect that the property boundary should remain with the newly situated stream or river. It is not surprising, therefore, that the common law rule provides that in cases of avulsion, the property boundary remains where it had been prior to the catastrophic event.<sup>3</sup>

The distinction between accretion and avulsion is only one example of the many common law rules for resolving and avoiding property rights conflict. But for the purposes of this paper it serves also as an allegorical illustration of humans coping with gradual versus immediate change. Like the landowners on opposites sides of a stream shifting its course by accretion, people easily accept and adapt to gradual change. But when change is instantaneous, expectations are disrupted and people tend to seek restoration of the status quo.

This seemingly natural human desire for stability and predictability has, for generations, found expression in customary behavior patterns that evolve into informal rules of particular communities. Because almost everyone benefits from predictability in their relations with others—thieves are an exception—most people willingly accept and adhere to these customary rules. The rules will change over time, as circumstances and community values evolve, but change will be gradual and not disruptive of day-to-day life. Occasionally external forces will bring dramatic change to which the

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<sup>2</sup> “Land formed by accretion belongs to the riparian owner on or against whose bank or shore the alluvial matter is deposited . . . .” 93 C.J.S. *Waters* § 184 (2014).

<sup>3</sup> “An avulsive event does not change the boundary of two estates separated by a water channel. It does not divest a riparian or littoral owner of title . . . .” 93 C.J.S. *Waters* § 186 (2014) (footnotes omitted).

usual response will be efforts to restore the previous personal and community equilibriums.

Not only do the accretion and avulsion rules mirror these natural inclinations, but the common law method that conceived those rules is founded, as it must be to have succeeded for centuries, in the human desire for certainty and stability. This does not mean that the common law method, or the people and communities it serves, are resistant to change or progress. Rather it means that change and progress come at a pace determined not by catastrophic events, visionary thinkers, thieves, or oppressive rulers, but by circumstances, knowledge, opportunity, and desire.

Some observers and commentators take the view that the common law method is one of periodic judicial intervention to relieve an otherwise rule-bound system of its inflexibility. But no rule-bound system could have produced the distinction between avulsion and accretion and the many other intricacies of the common law that serve the popular desire for certainty. These judicially embraced and constantly evolving guidelines for human social behavior could only have emerged from careful judicial assessment of their coherence with popular expectations.

Understanding the common law method in this way does not diminish the role of the judge. To the contrary, it requires the judge to look beyond personal experiences and predilections to determine what those who rely on the law in their daily lives need the law to do. Like the Earth that provides humans with sustenance and like markets that help humans make efficient use of the Earth's finite resources, the common law method is organic in the sense that it trends towards a steadily evolving and natural, if illusive, equilibrium. Its long life confirms that it has suited the constantly changing human condition.

## II. COMMON LAW AND ENVIRONMENTAL PROTECTION

In the early days of modern environmentalism, common law rules of nuisance, negligence, and trespass were generally dismissed as inadequate to the challenges of environmental protection in a densely populated and complex world. Centralized planning, regulation, and government management of publicly owned resources became the preferred methods for stemming the tide of ecological and environmental degradation. But over the last decade, environmentalists have rediscovered the common law and are appealing to state courts to intervene in a wide assortment of public and private activities and actions that affect the environment.<sup>4</sup>

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<sup>4</sup> See, e.g., Robin Kundis Craig, *Adapting to Climate Change: The Potential Role of State Common-Law Public Trust Doctrine*, 34 VT. L. REV. 781 (2010) (advocating state court reliance on common law public trust doctrine in climate change cases); J.B. Ruhl, *Making Nuisance Ecological*, 58 CASE W.

A major problem facing these reborn common law devotees is that established common law rules seldom justify the interventions they seek. Therefore, their challenge is to persuade judges that courts have authority to effectively amend and rewrite long-established common law rules. Not surprisingly, at least a few judges have embraced the role of lawmaker with creative interpretations of the common law doctrines of nuisance, negligence, and public trust.<sup>5</sup> In doing so, judges overstep their constitutional authority in our tripartite separation of powers system, and undermine the inherently adaptive attribute of the common law method.

A dominant theme in environmental protection advocacy is for restoration and maintenance of a natural equilibrium. The idea is that there is a natural balance that human activity tends to disrupt. For millennia, according to this view, nature's inherent restorative capacities were sufficient to offset the disruptions of relatively small human populations reliant on only simple technologies. But with the Industrial Revolution and burgeoning population growth, Mother Nature was no longer up to the task. The balance of nature could only be preserved if humans policed and restrained themselves. In a complex world inhabited by ever more people, it has been widely accepted that ever more complex rules and regulations are required. The result has been a growing web of plans, processes, standards, constraints, guidelines, prohibitions, and permissions administered by legions of political appointees and expert bureaucrats.

In *Simple Rules for a Complex World*, Richard Epstein contends that all this legal complexity is the wrong approach.<sup>6</sup> According to Epstein, as the world has become more complex and integrated, the prospects for effective, centralized management have diminished. The paradox, he argues, is that a complex world requires simple rules.

Regrettably, Epstein's argument has fallen on mostly deaf ears. Well into the fifth decade of modern environmental awareness, command-and-control regulation of private activity and an expanding management role for public resource agencies persist as the dominant approaches to environmental protection. The orthodox view remains that a complex world requires complex rules.

Advocates of simple rules have made some inroads for reasons that, though seldom acknowledged even by mainstream environmentalists, undergird the case for simple rules. Those inroads have taken the form of what have come to be called market incentives. Measures like tradable emissions permits, congestion pricing, and pollution taxes reflect a recogni-

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RES. L. REV. 753 (2008) (advocating state court reliance on common law public nuisance doctrine in environmental pollution cases).

<sup>5</sup> See, e.g., *Robinson Township v. Commonwealth*, 83 A.3d 901 (Pa. 2013) (applying public trust doctrine to "public natural resources"); *Palazzolo v. State*, No. WM 88-0297, 2005 WL 1645974 (R.I. Super. Ct. 2005) (unpublished decision) (applying public nuisance law to wetlands).

<sup>6</sup> Richard A. Epstein, *Simple Rules for a Complex World* (1997).

tion that, although the world is complex, it consists of billions of individual decision makers who respond to incentives reflecting their personal values and circumstances. When faced with a regulation placing a cap on emissions, for example, most individual decision makers will curtail emissions to the maximum level allowed but not lower. The holder of a tradable emission permit, however, has an incentive to curtail emissions as much as possible and profit from the sale of unused emission allowances.

Epstein's simple rules, and the rules of the common law, are firmly rooted in the simple, if clichéd, understanding that incentives matter. At the end of the day, virtually all human actions, whether taken in the name of private greed or the public interest, are the product of individual choices and are implemented by individuals. Even decisions and actions taken in concert are individual in the important sense that some individuals are in agreement and others are not. Epstein's simple rules, like common law nuisance, negligence, and trespass, are rooted in recognition of the inevitability of individual choice and action.<sup>7</sup>

Epstein's first rule of individual self-ownership is really an expression of this inevitability.<sup>8</sup> Individual self-ownership means that individuals not only will, but are entitled to, respond as they choose to incentives as they perceive them. Only the individual can say what is good for himself or herself, with appropriate exceptions made for the young and otherwise mentally incompetent.

The exercise of this self-ownership leads to Epstein's second rule of first possession.<sup>9</sup> Human life requires control, use, and consumption of natural resources. The first possession rule follows from individual self-ownership because any other foundational rule of entitlement would infringe self-ownership by allowing some individuals to grant or deny title to others.

With entitlement of previously unowned resources settled by first possession, Epstein's third rule allows that anyone can acquire possession by voluntary exchange,<sup>10</sup> which will occur only if a transfer of title makes both parties better off as they perceive their distinct personal welfares. Finally, entitlements acquired either by first possession or voluntary exchange must be protected against theft or damage by those not entitled.<sup>11</sup> Only then can the benefits of self-ownership, resource entitlement, and voluntary exchange be realized.<sup>12</sup>

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<sup>7</sup> *Id.* at 53.

<sup>8</sup> *Id.* at 54-59.

<sup>9</sup> *Id.* at 59-63.

<sup>10</sup> *Id.* at 71-73.

<sup>11</sup> *Id.* at 76-78.

<sup>12</sup> Three other—what might be called—community accommodating rules complete Epstein's collection of simple rules that, it might be noted, would fill only a fraction of a page in the *Federal Register*. For immediate purposes, however, the first four rules will suffice.

For Americans and others living in nations of British heritage, it happens that these simple rules have long existed in the English common law that constitutes a diminishing, but still significant, part of our legal regimes. It is not an exaggeration to suggest that much of what constitutes the first three books of William Blackstone's *Commentaries on the Laws of England* ("rights of persons," "rights of things," and "private wrongs") could be said to derive from an earlier formulation of Epstein's four simple rules.<sup>13</sup>

But the genius of the common law is that it emerged over centuries without reference to any such overarching principles.<sup>14</sup> No person or persons of genius set forth guiding principles for the birth and growth of the common law. Rather the common law was born of customs developed and respected by ordinary people in their inevitably personal interactions. It was sustained by gradual adaptation of the law to the natural evolution of those customs as circumstances and human preferences changed. To be sure, some people had more influence than others and the king had the most influence of all, but what emerged was not by design. It only looks that way with hindsight.

### III. THE ORIGINS OF COMMON LAW RULES OF PROPERTY AND LIABILITY

Adult humans are social creatures with the capacity to act autonomously in a world of scarce resources. Their autonomy allows them to act independently. Their social nature allows them to act collaboratively for mutual benefit. Their social nature also means that the actions of one or some can affect others. And the scarcity of resources assures that such conflicts will occur.

Conflicts among individuals in a world of scarce resources might be—and have been—resolved by brute force, but as Thomas Hobbes posited centuries ago,<sup>15</sup> the vast majority of individuals conclude that they will be better off with some system of rules for the allocation of scarce resources. Given the autonomy of individuals, first possession is an easily enforced rule for initial allocation. But even if we assert that nothing is owned or everything is owned by the community or by the king, simple physics dictates that, at the point of consumption or use, entitlement will have to lie with one or a few individuals and not others.<sup>16</sup> Once those individual enti-

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<sup>13</sup> WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND (1765–1769).

<sup>14</sup> Guiding principles did emerge over time as common law courts engaged in the iterative process of maintaining the internal coherence necessary to stability and predictability. The point is that these principles emerged (and adapted) as a sort of infrastructure for the spontaneous order facilitated by the common law courts, not as a vision from on high.

<sup>15</sup> THOMAS HOBBS, LEVIATHAN, ch. 13, 14 (1651).

<sup>16</sup> "Property is inevitable because when things are consumed or places are occupied some people do the consuming and occupying and other people are excluded." JAMES L. HUFFMAN, PRIVATE PROPERTY AND STATE POWER 37 (2013).

lements are established, by first possession or some other rule that does not respect self-ownership, exclusivity must be the rule if we are to avoid reverting to brute force.<sup>17</sup> Free exchange then allows for autonomous and peaceful adjustments over time.

Over several centuries, a multitude of common law rules emerged from the realities of the human condition—rules that answered questions like: Which individuals lack the mental or physical capacity to exercise their self-ownership, and what should be done when their interests and rights are affected? What facts constitute evidence of legitimate first possession? What exchanges are voluntary and which are coerced? When do actions on one person's property interfere with the rights of neighboring property owners, and when might invasion of another's property be justified? Do members of the public or the public as an entity have rights that limit the scope of private rights? The circumstances of life posed endless further questions.

In retrospect, we might conclude that the common law rules collected in Blackstone's Commentaries were the product of grand design, but it is inconceivable that any person or committee of wise men—or even wise women—could have contemplated all the possible questions that would arise, or have established rules for answering those questions in every possible variation. Rather, case-by-case, autonomous individuals interacting with other autonomous individuals resolved their disagreements and agreed to collaborate in their ambitions. Over time, in the interest of avoiding the costs of negotiation and conflict, the better solutions were adopted by others facing similar challenges.

Such customary solutions are ubiquitous in all human societies. The fact that they are customary is evidence that they are most often acceptable to most people. But as life becomes more complex, communities grow larger and travel becomes easier, relatively fewer people can be expected to know the customary rules. In Britain and its colonies, social institutions, including courts, emerged to provide confirmation of prevailing custom and to resolve disputes. Sometimes they got it wrong, but because there were multiple such institutions, competition among them assured that custom as perceived by ordinary people, not as might be thought preferable by judges and other officials, would prevail. It was in this setting of official and qua-

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<sup>17</sup> Professors Thomas Merrill and Henry Smith explain also that exclusivity is essential to the efficiency of common law property rights. They argue that while Ronald Coase embraced the modern concept of property as a bundle of rights held at the discretion of the state, his transformative insight on the role of transactions costs in the formation of human institutions is rooted in the traditional common law understanding of property rights as in rem—that is the right to exclude the entire world. Absent such exclusivity, property rights are contingent and therefore not a basis for exchange without incurring often high, and even prohibitive, transactions costs. *See generally* Thomas W. Merrill & Henry E. Smith, *Making Coasean Property More Coasean*, 54 J.L. & ECON. S77 (2011).

si-official formalizing of custom that the common law of property, contract, and tort emerged to facilitate commerce and community affairs.

In fact there was more at play than custom and judicial formalizing of custom. Even in simple societies, life is complex in the important sense that every person is a distinct individual with all that entails. In addition to customary rules, custom embedded in law, and market prices there are traditions, trust and distrust, peer pressure, family ties, resentments for reasons that often cannot be recalled, friendships, religious affiliations, the foibles of nature, and more. As Hayek makes clear in his essay *The Use of Knowledge in Society*, no individual, whether commoner or prince, can know enough to predict how all of these variable will play out across the society, let alone a nation.<sup>18</sup> But what both prince and commoner do have is better access than anyone else, to “knowledge of the particular circumstances of time and place”<sup>19</sup>—the local knowledge relevant to decisions and actions affecting themselves. The magic of both markets and the common law method, argued Hayek, is their merging of the hundreds and thousands and millions of these well informed individual actions into a spontaneous and constantly adapting order<sup>20</sup>—or perhaps more accurately as Todd Zywicki and Anthony Sanders put it, “spontaneous orders.”<sup>21</sup>

#### IV. DO JUDGES MAKE THE LAW?

It is often said that the difference between statutory law and the common law is that legislators make the former and judges make the latter. But this suggests that common law judges perform the same function as legislators—that legislatures and common law courts are just two different institutions for law making. While there is certainly evidence that a few modern courts have embraced the idea of judge as legislator, usually where advocates contend that the elected legislature has failed to solve pressing public issues, legislation was not the historic role of common law judges. Nor can it be the role of today’s judges if we are to remain committed to the rule of

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<sup>18</sup> See generally Friedrich A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519 (1945).

<sup>19</sup> *Id.* at 521.

<sup>20</sup> Of the common law process Hayek wrote:

While the process of articulation of pre-existing rules will . . . often lead to alterations in the body of such rules, this will have little effect on the belief that those formulating the rules do no more, and have no power to do more, than to find and express already existing rules, a task in which fallible humans will often go wrong, but in the performance of which they have no free choice.

1 FRIEDRICH A. HAYEK, *LAW, LEGISLATION AND LIBERTY: RULES AND ORDER* 78 (Routledge 1998) (1973).

<sup>21</sup> Todd J. Zywicki & Anthony B. Sanders, *Posner, Hayek, and the Economic Analysis of Law*, 93 IOWA L. REV. 559, 577 (2008) (emphasis added).

law enforced by an independent judiciary while taking advantage of the remarkably adaptive capacities of the traditional common law method.

Two distinct strands of modern legal scholarship have inadvertently and ironically encouraged the perception of common law judges as public policy lawmakers. A third strand, at least in its modern incarnation, concludes that it can be no other way.

Law and economics, the study of law through the lens of economic theory, led scholars like Paul Rubin<sup>22</sup> and George Priest<sup>23</sup> to conclude, quite correctly, that the common law tended to progress from less to more efficient rules. An explanation of this historic trend, favored by those who would look to the courts to advance their policy agendas, is that clever judges devised rules that would promote efficient use of scarce resources. In other words, some judges had an understanding of the effect of legal rules on individual decision making and saw it as their public responsibility to select and enforce rules that promote efficient choices. Perhaps the George Mason University Law and Economics Center's longstanding courses for judges reflect a realist's recognition that some judges will be lawmakers and therefore should better understand how to do it.

In parallel with the rise of law and economics, historians of American law were inspired by Willard Hurst's idea that the historical development of law is best understood as the adaptation of legal rules to serve the interests and needs of the people subject to those rules. In his book *Law and the Conditions of Freedom in the Nineteenth Century United States* Hurst argued that nineteenth century Americans used law to facilitate the release of human energy, thus facilitating the rapid development of the vast North American continent.<sup>24</sup>

If one ignores the historical sources Hurst relied upon and focuses only on the idea of law as an instrument of progress, it is easy to conclude that judges were and are responsible for the design, manipulation and modification of the law's tools. Courts were, after all, the dominant players in nineteenth century American law, so it is perfectly logical to conclude that clever judges have modified old law and created new law suited to America's westward expansion and rapid industrialization.

Finally legal realism, born of Oliver Wendell Holmes, Jr.'s observation that "[t]he life of the law has not been logic; it has been experience,"<sup>25</sup> declares, not incorrectly, that judges are people too—people influenced by their family backgrounds, education, religion, race, political leanings, and so on. One can interpret the realists' insight as a caution that adherence to

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<sup>22</sup> See generally Paul H. Rubin, *Why Is the Common Law Efficient?*, 6 J. LEGAL. STUD. 51 (1977).

<sup>23</sup> See generally George L. Priest, *The Common Law Process and the Selection of Efficient Rules*, 6 J. LEGAL. STUD. 65 (1977).

<sup>24</sup> See generally J. WILLARD HURST, *LAW AND THE CONDITIONS OF FREEDOM IN THE NINETEENTH CENTURY UNITED STATES* (1956).

<sup>25</sup> OLIVER WENDELL HOLMES, JR., *THE COMMON LAW* 1 (1881).

the rule of law is not easily achieved—that even judges of the highest character must be constantly reminded of their duty to apply the law as it is, not as they might wish it to be. Or one can interpret the realist message to mean that judges will, at least to some degree, employ their power in pursuit of personal, special interest, or public ends as they perceive them.

#### A. *Law and Economics Theory as an Invitation to Judicial Law Making*

How law and economics theory can lead to the conclusion that wise and public-spirited judges have kept the common law up to date is illustrated in a study by Jeffrey Stake on the law relating to efforts by what he calls “dynasts” to restrict alienation of property by their heirs, though Stake rejects that view.<sup>26</sup> The history Stake recounts begins with property owners restricting alienation by conveying their estate “to *A* and the heirs of his body.”<sup>27</sup> The intended effect was to pass the property to *A*, normally the eldest son, who could only convey the property to his heir and so on. At the instance of heirs who saw personal advantages to alienation, the courts invalidated such restraints as control by “the dead hand of the past” and therefore contrary to the principle of fee simple title.<sup>28</sup> The dynasts, a fair number of whom were members of Parliament, then persuaded Parliament in 1285 to mandate that the recipient of a grant limited to him “and the heirs of his body” could not sell the land even after the birth of heirs of his own. An estate thus restricted against alienation out of the family is known as the “fee tail.”<sup>29</sup>

A consequence of this restraint on alienation was that alienable land became gradually scarcer and therefore more valuable. Holders of unalienable fee tails thus had growing incentives to “disentail” their estates. They resorted to various legal schemes, one of which, the “collusive common recovery,” was held in 1472 to “bar the entail” and thus terminate the interests of “heirs of his body.”<sup>30</sup> Dynasts responded with counter schemes like the perpetual freehold which was “a transfer to *A* for life, then to his son for life, then to his son’s son for life, and so on in perpetuity.”<sup>31</sup> Although this was curtailed in the 1585 case of *Lovelace v. Lovelace*,<sup>32</sup> those seeking to exercise the dead hand of the past experimented with other mechanisms for establishing perpetuities. Finally, in 1682 in *The Duke of Norfolk’s Case*,<sup>33</sup>

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<sup>26</sup> Jeffrey E. Stake, *Evolution of Rules in a Common Law System: Differential Litigation of the Fee Tail and Other Perpetuities*, 32 FLA. ST. U. L. REV. 401 (2005).

<sup>27</sup> *Id.* at 410.

<sup>28</sup> *Id.* at 412.

<sup>29</sup> *Id.* at 410.

<sup>30</sup> A. W. BRIAN SIMPSON, *A HISTORY OF THE LAND LAW* 129-32 (2d ed. 1986).

<sup>31</sup> *Id.* at 417.

<sup>32</sup> *Lovelace v. Lovelace*, 27 Cro. Eliz. 40 (1585).

<sup>33</sup> *The Duke of Norfolk’s Case*, 22 Eng. Rep. 931 (Ch. 1682).

Lord Nottingham declared that the only valid future interests were those certain to vest, or not, within the lives of living persons. Thus was launched a nemesis of every first-year law student, the rule against perpetuities.

Of course there is much more to this story of common law developments in relation to future control of land and other property interests, but the foregoing will suffice to underscore that those developments did not occur in the lofty seclusion of a judge's chambers or the House of Lords. Private interests were constantly maneuvering in pursuit of their objectives, often devising what today might be called "work-arounds," when the law was an obstacle. Absent intervention by Parliament, judges had to determine the validity of these work-arounds. In doing so, their options, broadly speaking, were to decide with reference to abstract philosophical and policy principles or with regard for the expressed ambitions of those affected by the law.

On the basis of his examination of the common law relating to perpetuities, Stake concludes that the tendency toward more efficient rules would have occurred whether or not judges understood some economics and believed that efficient rules are better for society.<sup>34</sup> The reason is that those benefitting from alienability had powerful economic incentives and therefore greater resources than the dynasts to challenge restraints on alienation.<sup>35</sup> Thus every new restraint on alienation provided grist for the judicial mill of the common law. Judges did not have to prefer efficient rules to render decisions that promote efficiency. Indeed, the record of judicial rulings on restraints on alienation wavered over time. "The fact that courts did not always hold for alienability," argues Stake, "indicates that the drift toward efficiency is not readily attributable to such an inclination in the judges themselves."<sup>36</sup>

If not a judicial preference for efficient rules, what explains the fact that, as a general matter, the common law evolved toward more efficient rules? The simple answer is that people in general prefer to improve their lives, which means they prefer efficient rules. Judges will sometimes be biased toward those seeking to impose their will on the future or otherwise constrain freedom, but in a rule of law system to which everyone has access, the tendency will be toward rules that serve everyone. The best way to know what those rules should be is to hear the claims of petitioners, note the terms and conditions of their agreements and out of court settlements, and otherwise observe how they seek to conduct their economic and social affairs. The last thing most of those petitioners will be looking for are ossified rules that constrain their freedoms or judge-made rules that upset their expectations. Old rules adapted to new circumstances serve both innova-

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<sup>34</sup> Stake, *supra* note 26, at 423.

<sup>35</sup> *Id.*

<sup>36</sup> *Id.* at 419.

tion and expectation. That is the traditional method of the common law, and because change is user driven, it tends toward efficient rules.

But the fact that, in this and many other examples, the common law tended toward efficient rules invites the conclusion that those rules were devised by judges seeking to promote efficiency. This, in turn, encourages present day advocates to invite judges to amend existing common law rules in pursuit of one policy goal or another, an invitation some judges are more than willing to accept.

### B. *Legal Instrumentalism as Evidence of Judicial Law Making*

There is another reason many present-day lawyers and judges, most educated almost exclusively by exposure to appellate court opinions, accept that a system of rules that tends toward efficiency is a system of rules designed by judges to be efficient. A superficial understanding of Willard Hurst's widely embraced instrumentalist approach to legal history easily encourages that conclusion. If the explanation for changes in the law is that those changes are meant to serve particular human purposes, it only makes sense that judges abandon or amend existing rules and pronounce new rules in service to ends perceived by the judges to be in the public interest.

Consider the example of Judge Benjamin Cardozo's decision in the case of *MacPherson v. Buick Motor Company*.<sup>37</sup> MacPherson was injured when one of the wooden wheels on his 1909 Buick Runabout collapsed. MacPherson sued Buick for damages. Buick's defense was that it had no liability because MacPherson had purchased the car from a dealer. Buick relied on the English case of *Winterbottom v. Wright*,<sup>38</sup> in which the court had ruled that a plaintiff injured in the use of a defective carriage could not recover from the manufacturer because there was no privity of contract between the plaintiff and the manufacturer. In *MacPherson*, Cardozo abandoned the privity requirement, holding that where a product is "reasonably certain to place life and limb in peril when negligently made" and it is known "that the thing will be used [without tests] by persons other than the purchaser . . . then, irrespective of contract, the manufacturer of this thing of danger is under a duty to make it carefully."<sup>39</sup>

One might describe the rule announced in *MacPherson* as a total break with the previous common law rule and the imposition of a new rule determined by the judge to be in the best interests of a society then entering an age in which inherently dangerous products were increasingly likely to be acquired from someone other than the manufacturer. On this understanding, the judge hears the legal arguments of the parties but also looks beyond

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<sup>37</sup> *MacPherson v. Buick Motor Co.*, 217 N.Y. 382 (Ct. App. N.Y. 1916).

<sup>38</sup> *Winterbottom v. Wright*, 152 Eng. Rep. 402, 403 (Ex. 1842).

<sup>39</sup> *MacPherson*, 217 N.Y. at 389.

the courtroom at contemporary circumstances and public needs. In other words, the judge might purport to be following the law, but in reality he is making or amending law in service to efficiency, fairness, public welfare, or whatever other noble or ignoble objective the judge holds dear.

But one might also describe the rule announced in *MacPherson* as responsive to the needs of producers and consumers in a manufacturing economy transformed by mass production for a national market. The privity requirement of *Winterbottom* assured that the maker and purchaser of a product would know from their direct dealing the uses to which that particular product would be put. The manufacturer could create a product suited to the consumer's needs and the consumer would thereby know the product's limits. However, with centralized, assembly line manufacturing of automobiles for a mass market, direct interaction between maker and purchaser was not practical and, in any event, both parties could reasonably anticipate how the product would and would not be used. The manufacturer, noted Cardozo, had "knowledge that the thing will be used by persons other than the purchaser, and used without new tests."<sup>40</sup>

That purchasers of automobiles would prefer no privity requirement is obvious. If selling cars through intermediary dealers effectively immunized manufacturers from liability they would have less incentive to build safe automobiles and, in the event of injury, purchasers would have to seek recovery from the usually shallower pockets of local dealers who would have to increase prices if they were to be held liable for the negligence of the manufacturer. Like the dynasts who fought to maintain control from the grave, car manufacturers resisted the abandonment of the privity requirement, but the common law judge's task was not to keep everyone happy, including dynasts and automakers. The judge's task was to maintain the internal coherence of the rules on which expectations rested. When carriage makers dealt directly with carriage purchasers, both understood that the manufacturer would be liable for defects resulting from negligence. Cardozo's elimination of the privity requirement thus preserved the expectations of both parties.

In the long run, as today's warranty competition among automakers evidences, both producers and consumers are better served by abandonment of the privity requirement. Liability for negligence had long reflected broad agreement that individuals should be able to rely on one another to take reasonable precautions against injury to themselves and others—a legal application of the golden rule. Insisting on privity as a condition of liability in the circumstance of mass production would require either abandonment of negligence-based liability or foregoing the considerable efficiencies of mass production. Where privity once assured that manufacturers were aware of those relying on them and the scope of their reliance, in the new-

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<sup>40</sup> *Id.*

found circumstance of mass production it stood as an obstacle to liability even though reliance was well understood by both parties.

Should we view Cardozo's *MacPherson* ruling as judicial law making in the public interest, or simply as an effort to preserve longstanding and widely accepted expectations reasonably rooted in the law? The concept of legal instrumentalism, not to mention Cardozo's own theorizing on the judicial process,<sup>41</sup> may invite the former understanding, but the methods of Hurstian legal history support the latter. Putting aside legal formalities, Cardozo had to know that, but for the new intermediary of a local Buick dealer, both Buick and the purchaser would expect Buick to be liable for harm resulting from its negligence. Abandoning the privity rule was the only way to preserve those expectations.

Where Hurst's legal historian predecessors looked to the pronouncements of great legal minds to explain legal developments, Hurst looked to the legal records of day-to-day life. His revolutionary idea was that even the most erudite judges, if true to the common law methods of their predecessors, sought only to adapt the law to the expectations and demonstrated needs of ordinary people living in a changing world. Thus Hurst did not look to the great thinkers for his understanding. Rather his sources were local county records, business agreements, wills and other personal and family documents, and other indications of how people sought to arrange and advance their lives through the rule of law.

Holmes' previously quoted observation that "[t]he life of the law has not been logic; it has been experience"<sup>42</sup> is generally understood to have reference to the experience of judges, and perhaps that is what Holmes intended. The most prominent Holmesian among modern judges, Richard Posner, certainly takes that view in pressing his case for judicial pragmatism.<sup>43</sup> Posner is not confident that every judge is up to the challenge of adjudication with a pragmatic eye to the public interest, but judges of experience, particularly those distinguished by intellect, should do so, though always while taking care to justify with carefully constructed legal rationales.<sup>44</sup>

While Hurst would confirm that experience is the life of the common law, it was not the personal experiences of individual judges that concerned him. The present-day enthusiasm for judges of diverse backgrounds may serve egalitarian ambitions for judges who look like the population, but the reality is that any individual judge has only his or her own life experiences. If every judge looks to the personally familiar in resolving the disputes of

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<sup>41</sup> See generally BENJAMIN N. CARDOZO, *THE NATURE OF THE JUDICIAL PROCESS* (1921).

<sup>42</sup> See HOLMES, *supra* note 25, at 1.

<sup>43</sup> See generally RICHARD A. POSNER, *LAW, PRAGMATISM, AND DEMOCRACY* (2003).

<sup>44</sup> *Id.* at 18 ("[A] pragmatic judge might in some circumstances decide to adopt a formalist rhetoric for his judicial opinions—might even decide to embrace formalism as a pragmatic strategy rather than just as a pragmatic rhetoric.").

others, those who are different, whether by race, ethnicity or economic condition will be disadvantaged.

Rather Hurst understood that the common law judge is, or should be, an observer of the expectations and actions of those who bring their disputes before the court. Indeed it is those non-judicial experiences that provided the lion's share of historical data for Hurst. The reality is that the vast majority of disagreements are resolved long before they might reach a court. And even before there are disagreements there are agreements arrived at by parties anxious to avoid disruptive and costly disagreements. Like the customs from which the common law emerged, most of the life of the common law takes place far removed from the courts. The day-to-day actions and transactions of ordinary people seeking to advance their lives in cooperation with others constitute the truly foundational experiences of the common law. It is those experiences that formed the tracks traced by Hurst and his fellow instrumentalist legal historians.

Disputes not resolved before they arrive at the courthouse door are, more likely than not, disputes rooted in some amount of legal uncertainty. Sometimes the only question in dispute is one of fact, but far more often there is disagreement between the parties about the meaning of the law or how the law applies to a particular set of facts. The advantage the common law judge has in resolving these disputes over the meaning of the law lies in being able to assess, without having a personal stake in the outcome, what the reasonable expectations of the parties would have been before the dispute arose. By reconstructing the circumstances of both parties prior to the dispute, by examining the practices of others engaged in similar pursuits, and by studying how similar disputes have been resolved in other courts, the judge can determine what the reasonable legal expectations of the parties should have been. There is no guarantee that the judge will get it right every time, but when the judge gets it wrong, his ruling will quickly lose its precedential value as enterprising people collaborate to establish the expectations they prefer.<sup>45</sup>

Each judge is in a position to know a lot about the case before him, and through the iterative process of many judges rendering many decisions over time, vague and unclear rules can be clarified and the law can be adapted to the demonstrated needs of those who have undertaken the expense of seeking resolution in a court. If we accept that a core objective of

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<sup>45</sup> Lawyers educated in the twentieth century and later may be inclined to argue that every judicial decision, whether right or wrong, in terms of the parties ex ante expectations, is binding law going forward pursuant to the principle of stare decisis. But as Zywicki and Sanders point out, stare decisis, as most lawyers understand the principle today, did not arise until the mid-nineteenth century. Zywicki & Sanders, *supra* note 21, at 580-81. In explaining how the common law worked, legal historian Theodore Plucknett wrote: "An important point to remember is that one case constitutes a precedent; several cases serve as evidence of a custom. . . . It is the custom which governs the decision, not the case or cases cited as proof of the custom." THEODORE F.T. PLUCKNETT, A CONCISE HISTORY OF THE COMMON LAW 347 (5th ed. 1956).

law is to provide greater certainty in an otherwise chaotic world, there is no better guide than the actions, precautions, informal and formal agreements, private settlements and occasional appeals to the courts of those with the most at stake. It is working to understand all of that, not careful analysis of the opinions and writings of great men, which defines Willard Hurst's theory of legal instrumentalism.

### C. *Legal Realism as Confirmation of Judicial Law Making*

Holmes, like Cardozo, objected to the perceived formalism of nineteenth century English and American law. Both judges rejected the idea that every case could be resolved with reference to a preexisting set of principles, and they insisted that in the real world of judging that is not what most judges do or aspire to do. Cardozo and Holmes were what came to be known as legal realists.

Legal realists, wrote Grant Gilmore, take the view that "rules of law do not so much explain as conceal the bases of judicial decision."<sup>46</sup> According to this understanding, said Gilmore, "[a] judge's holding in a case is an ad hoc response to a unique state of facts, rationalized after the event, with a dissimulation more or less conscious, and fitted willy-nilly into the Procrustean bed of approved doctrine."<sup>47</sup> Legal realism was, thus, a reaction against legal formalism—the idea that the law exists as an enclosed system of logically interrelated rules that judges apply to resolve particular cases. Legal realists rejected the view that, while the existing rules may not speak directly to the case at hand, overarching principles and logic allow the judge to resolve each case consistent with those rules.

Most lawyers and legal scholars today accept that the legal realists were right, at least to the extent of recognizing that judges are unavoidably who they are, and that they can, if they choose, offer legal rationalizations for ad hoc decisions. Once we accept that much of the realist conclusion, we are left to either insist that judges must nevertheless do their best to be faithful to the law or proffer some other principled justification for their rulings. What we cannot accept, consistent with any understanding of the rule of law, is that each judicial ruling is simply an ad hoc exercise of judicial will or whim. One does not need to be a rigid formalist to reject the claim that judges in the American system of constitutionally divided powers are free to make and amend law as they see fit. Even if their reasons are principled in the sense that they have reference to the public good rather than personal bias or gain, it is not the judicial role to legislate—not only because another branch of government possesses that power, but because

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<sup>46</sup> Grant Gilmore, *Legal Realism: Its Cause and Cure*, 70 YALE L.J. 1037, 1038 (1961).

<sup>47</sup> *Id.*

judicial decisions by their nature have retroactive effect. Nothing offends the rule of law more than retroactive enforcement of new rules.

But the boundary between common law adaptation to meet the needs of ordinary people and judicial law making to serve a public purpose is easily blurred. As Posner has explained, the good pragmatic judge can usually accomplish the latter while claiming obeisance to existing law.<sup>48</sup> Proponents of the most recent incarnation of legal realism, the so-called Critics, insist that most judges are pragmatists in the very worst sense—they hold power and decide cases to benefit the powerful.<sup>49</sup> Whether one takes that extreme view of judging or the more generous realist position that judges are inevitably and often unconsciously influenced by a multitude of considerations extraneous to the facts of a case, the legal realist's recognition encourages those who would look to the courts to make law. If they are doing it in any event, better that they make law that serves the advocate's interests—always represented as the public interest.

#### D. *The Appeal of Judge-Made Law*

In combination, the recognitions that the common law has tended toward efficient rules, that legal history can be understood as a progression of instrumental adaptations of legal rules, and that judges are independent actors bound only by self-restraint to the rule of law, encourage appeal to the courts for legal change. The oft-repeated conclusion that the common law is judge made makes perfect sense once we accept that judges of free will have overseen legal change serving efficiency and other ends. Those seeking legal change naturally look to the courts for changes that will serve their policy objectives, while some judges of good conscience are tempted to employ their immense powers in pursuit of the public good.

Though seemingly supported by this combination of academic theories about common law development, the notion of the judge as lawmaker has influence well beyond the limited context of common law claims before state court judges. If judges have the capacity and authority to amend and rewrite the common law in the public interest, surely they can and should do the same when it comes to statutory, regulatory and even constitutional cases. Once judges start justifying decisions in policy terms, even if their

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<sup>48</sup> For example, Posner defends the Supreme Court's ruling in *Bush v. Gore* on pragmatic grounds—there were many serious consequences if the case was not resolved quickly. He is nonetheless critical of the majority's legal justification of the decision—Article II is a better legal basis than the equal protection clause in his view. But better that than simply stating the national need for prompt resolution. Every judicial decision, including those rooted in pragmatism, must be a “legal-type judgment.” RICHARD A. POSNER, *BREAKING THE DEADLOCK* 145 (2001).

<sup>49</sup> See generally MARK KELMAN, *A GUIDE TO CRITICAL LEGAL STUDIES* (1990) (for a general overview of critical legal studies).

legal justifications are plausible, they invite those unhappy with existing law to seek relief in the courts on policy grounds. Judicial law making creates its own demand for more. For special interests it is often less expensive than engagement in the political process, and has the advantage of requiring the persuasion of only one or a handful of judges rather than a majority of voters or legislators.

An obvious problem with acceptance of the idea of judge as lawmaker is that it runs counter to the rule of law. While it is not difficult to imagine a legal system in which judges or other individuals are empowered to amend existing laws and proclaim new laws as they see fit—our nation was founded, after all, by a people who objected to such lawmaking by a king—it is not the legal system envisioned by the those founders. Our federal and state constitutions go to great lengths to divide and constrain the powers of government to safeguard the rights of individuals and assure the rule of law. Even if the common law judges of pre-revolutionary America were endowed with the lawmaking power—a doubtful proposition at best—there is no reason to suggest that such power would have survived the ratification of a constitution founded on the principle that all government power is exercised at the will of the people.

## V. A DEMAND-SIDE UNDERSTANDING OF THE COMMON LAW METHOD

The implications for the rule of law of a judiciary with acknowledged lawmaking authority warrant our attention. But the remainder of this paper is devoted to a second and less obvious problem. If the common law judge is free to amend and rewrite the law as he or she sees fit, we will have abandoned one of the great strengths of the common law method—that of serving the rule of law by adapting legal rules to the demonstrated needs and wishes of those who rely on law to bring at least a degree of certainty to their day-to-day lives.

Several years ago Douglas Whitman suggested that most explanations of common law evolution are either “supply side” or “demand side.” “Supply-side models . . . explain the evolution of legal rules primarily in terms of the preferences and behavior of the makers of law, judges.” “[D]emand-side models,” on the other hand, “explain the evolution of legal rules primarily in terms of the behavior of potential litigants, whose actions are driven in part by the efficiency and other properties of the legal rules that affect them.”<sup>50</sup>

Whitman’s demand-side formulation is reminiscent of Friedrich Hayek’s explanation of how traditional common law courts actually functioned.

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<sup>50</sup> Douglas Glen Whitman, *Evolution of the Common Law and the Emergence of Compromise*, 29 J. LEGAL STUD. 753, 775-76 (2000); see also Todd J. Zywicki, *The Rise and Fall of Efficiency in the Common Law: A Supply-Side Analysis*, 97 NW. U. L. REV. 1551, 1629 (2003).

As summarized by Todd Zywicki and Anthony Sanders, Hayek understood the common law as “a ‘purpose-independent’ system designed to enable individuals to increase the predictability of each others’ behavior and, thus, to better coordinate their affairs.”<sup>51</sup> Hayek did not argue that it is improper for judges to make law for policy reasons, though he might have in the context of American constitutional government; rather he concluded that it is impossible because no single judge or collection of judges can acquire the knowledge necessary for intelligent policy making.<sup>52</sup> It is the same argument he made with respect to central planning of all sorts,<sup>53</sup> and for Hayek purposeful judicial lawmaking is no less a form of central planning than what occurs in an explicitly socialist state.

What makes the common law particularly effective, in Hayek’s view, is exactly the same thing that makes markets effective in the allocation of scarce resources. The common law process, like markets, aggregates individual choices based on local knowledge with a resultant efficiency of social outcomes that no central planner could come close to achieving. Both institutions overcome the knowledge problem by relying on local choices where relevant knowledge, though not perfect, is the best it can be.

While there are landmark cases that support the supply-side explanation—often found in law school casebooks because they upset expectations—the vast majority of common law cases, right up to the present day, evidence a demand-side approach. Most judges, most of the time, seek to establish what the reasonable legal expectations of the parties should have been before the fact. Judges understand that it is with reference to those expectations that the parties agreed to interact, assume risks or expose others to risks. A conscious decision to ignore those expectations by imposing a new rule that neither party could have anticipated runs counter to both efficiency and the core value of the rule of law.

Perhaps the best indication that the demand-side view is generally accepted as consistent with the rule of law is that judges tempted to the supply-side understanding of their role almost invariably do their best to justify their lawmaking in rule of law terms. They offer sometimes implausible explanations for how a totally new rule is actually consistent with precedent and why the parties should have anticipated the change. Illustrative in the area of environmental law are the persistent efforts by state courts to explain unprecedented extensions of public trust law as founded in ancient Roman law having no connection whatsoever to the Anglo-American pub-

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<sup>51</sup> Zywicki & Sanders, *supra* note 21, at 587.

<sup>52</sup> HAYEK, *supra* note 20, at 102.

<sup>53</sup> See Hayek, *supra* note 18, at 519-20 (“The economic problem of society is thus not merely a problem of how to allocate ‘given’ resources . . . [i]t is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know.”).

lic trust doctrine,<sup>54</sup> and equally unprecedented reliance on public nuisance law to find single manufacturers liable for global climate change.<sup>55</sup>

This does not mean that law making judges necessarily shy away from defending the policy preferences that truly guide their legal innovations, but even then they do their best to support their decision with traditional rule of law arguments. Either the rule of law philosophy is so deeply ingrained that they feel obliged to defend their policy choice as a law based decision, or they feel a need to cover their law-making tracks. Either way their insistence that they are relying on precedent underscores a perceived need to justify decisions in rule of law terms. In his book on the Supreme Court's decision in *Bush v. Gore*, Richard Posner is quite explicit in suggesting that law-making judges need to cover their tracks with legal arguments.<sup>56</sup> From his pragmatist perspective, the presidential election needed to be concluded as quickly as possible, whatever the law, but the court's resolution required the best legal justification the court could muster.<sup>57</sup>

That at least a few common law judges followed Posner's pragmatist prescription, even before Blackstone's Commentaries, cannot be disputed. Sometimes a judge's objective in rewriting the law has been self-serving or in service to friends and associates. But on other occasions law-making judges have been, like Posner, truly committed to the public good. Two challenges these well-intentioned judges face are to know the public good and to determine what existing rules are not serving the public good and what new rules will be better. Despite the self-confidence often evident in their opinions and the public support they may garner, there is no reason to believe that even the brightest and most well educated judge has special insights on the public good. And given the institutional framework within which they work, all judges are poorly positioned as policy makers.

It might be argued that judicial law-making is actually a demand-side enterprise since litigants and their sympathizers often urge upon the courts a

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<sup>54</sup> James L. Huffman, Speaking of Inconvenient Truths—A History of the Public Trust Doctrine, 18 DUKE ENV. L. & POL'Y F. 1, 12-19 (2008); see also, Patrick Deveney, *Title, Jus Publicum, and the Public Trust: An Historical Analysis*, 1 SEA GRANT L.J. 13, 37 (1976) ("Roman law was innocent of the idea of trusts, had no idea at all of a "public" (in the sense we use the term) as the beneficiary of such a trust, allowed no legal remedies whatever against state allotment of land, exploited by private monopolies everything (including the sea and the seashore) that was worth exploiting, and had a general idea of public rights that is quite alien to our own." (footnotes omitted)).

<sup>55</sup> Under the common law, there is no private action for a public nuisance except where the plaintiff can also plead a private nuisance. The public nuisance climate change theorists seek relief as individual members of the public for an alleged public nuisance where no actionable private nuisance can be said to exist. As Blackstone explained, "[b]ecause public nuisances 'annoy the whole community in general, and not merely some particular person;' . . . they 'are indictable only, and not actionable.'" Quoted in James L. Huffman, *Beware of Greens in Praise of the Common Law*, 58 CASE W. RES. L. REV. 813, 823 (2008).

<sup>56</sup> See discussion *infra* note 48.

<sup>57</sup> See James L. Huffman, *Like the Supreme Court, Posner is Right for the Wrong Reasons*, 1 L. PROBABILITY & RISK 67, 69-70 (2002).

public need for legal change. In his celebrated dissent in *Lochner v. New York*, Justice Holmes said that “the word ‘liberty,’ in the Fourteenth Amendment, is perverted when it is held to prevent the natural outcome of a dominant opinion.”<sup>58</sup> “This case,” he wrote, “is decided upon an economic theory which a large part of the country does not entertain.”<sup>59</sup> His point was that he believed there was broad public support for laws like the New York law limiting the hours of workers in bakeries and confectionaries that the Supreme Court majority had invalidated as an unconstitutional infringement on freedom of contract. His duty as a judge, Holmes said, was to uphold laws demanded by the public, notwithstanding preexisting common law rules of contract to the contrary. Holmes was also at pains to state that his “agreement or disagreement [with the dominant opinion] has nothing to do with the right of a majority to embody their opinions in law.”<sup>60</sup>

In a case like *Lochner* where the court is asked to invalidate a democratically enacted law, it was easy for Holmes to assert with confidence what the dominant opinion was, although given the vicissitudes of public opinion it could have been different by the time Holmes wrote. But in the ordinary common law case the judge has no basis for knowing what the dominant opinion is or was. The judicial process is not designed to inform the judge of public opinion or any other possible measure of the public good. The judge is left to his own opinion, or the opinions of the litigants, or of third parties. And even if the judge could divine public opinion with respect to an existing common law rule, a commitment to the rule of law and individual rights—including those founded in the common law—makes that knowledge irrelevant, just as it should be when courts are asked, as in *Lochner*, to assess the constitutionality of a democratically enacted law.

Thus, suggesting that judicial law making in response to public pressure or appeals to the public interest represents a demand-side approach to the role of the courts is a gross distortion of Whitman’s point in distinguishing demand- and supply-side theories. The use of those terms and the suggestion that the common law method is driven by demand is intended to suggest a parallel between the common law method and a free market economy. Just as it is difficult for public regulators and producers to know how much of what to supply, it is difficult—Hayek says impossible—for judges to know what rules will best serve people who rely on those rules in their day-to-day existence. Judges might rely on their personal knowledge or, as Holmes suggests, on the will of a majority, but as with economic markets, a far more reliable measure will be the actual, willingness-to-pay demands of consumers.

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<sup>58</sup> *Lochner v. New York*, 198 U.S. 45, 76 (1905) (Holmes, J., dissenting).

<sup>59</sup> *Id.*

<sup>60</sup> *Id.*

The parallel is not perfect. With all the usual economists' caveats, markets are by far the most efficient and dynamic indicator of consumer preferences and willingness to pay. Markets work because they allow consumers to express their preferences, change their minds, take risks, and correct their mistakes without interference or second-guessing by third parties. Rather than guess what consumers will be willing to purchase, producers thus have good information about how much of what to supply. The common law method, understood as a demand-side enterprise, is more plodding and less comprehensive, but similar in its reliance on first-hand indicators of consumer preference.

For the most part, the business of judging, like the business of supplying goods and services, is routine. Cases come before a judge who resolves disputes of fact and then rules for one party or the other based on how the law applies to those facts. Sometimes there will be disagreement between the parties on what the law says or how it applies to their case. The disagreement may reflect that one party is self-evidently wrong, but it can also reflect what jurisprudential theorists have called "gaps" in the law. Gaps in the common law exist when existing precedents seemingly fail to address the particulars of the case at hand. What the judge is to do when faced with such gaps remains a persistent question in Anglo-American jurisprudence.

Where the law is clear—where there are no gaps—few matters will come close to a courtroom. But when they do it is widely accepted that the judge's role is simply to enforce the law, even if the judge believes that a different result would be a good thing, whether for personal or asserted principled reasons. We embrace that understanding of the judge's role because we value the resulting certainty and the self-ownership it promotes. In other words, to borrow from Hurst, we embrace the rule of law for instrumentalist reasons.

Because gaps undercut certainty, we aspire to laws without gaps. Therefore, in filling the inevitable gaps produced by the limits of knowledge and foresight, judges should make their best effort to devise rules reasonably to have been anticipated by the parties prior to the case at hand. It will not do to ask the parties themselves about their previous expectations. Today they know what they did not know then. But the judge can look to the past behavior of the disputants and to the expectations of others as evidenced in relevant precedents. The common law method of case-by-case adjudication yields a sampling of evolving expectations and accommodations by others confronted by gaps in the law. By filling those gaps with rules responsive to such concrete expressions of preference, judges have adapted the common law to changing conditions while respecting the popular desire for certainty. Some might be tempted to call it the invisible hand of the common law, but perhaps a better metaphor is the invisible hands of the multitudes affected by the common law.

To be sure, some judges occasionally take it upon themselves to fill gaps in the law with well-intentioned pronouncements of rules that run

counter to the reasonable legal expectations of everyone. On these occasions not everyone is unhappy with the new judge-made law, especially those who might benefit from a change in the law that effectively redistributes wealth or power. But when judges fill gaps with new laws to serve purposes of their own choosing, reasonable legal expectations founded on the rule of law become irrelevant. Rather than helping to reduce the uncertainties inherent in social interaction, the law becomes a source of uncertainty. In advising clients, lawyers must then look to judicial bias and politics rather than legal precedent and the internal logic of the rules in question.

Much of human history could be recounted in terms of countervailing influences on the uncertainties inherent in social existence on a dynamic planet of finite resources. Technologies ranging from the Farmers' Almanac to satellite weather forecasting, from slash-and-burn farming to genetically modified crops, from sun dried pemmican to modern refrigeration have reduced the uncertainties of weather, harvest and food preservation. Similar technological advances have smoothed every other aspect of day-to-day life. And so has the law reduced the uncertainties of social life, from the customs of primitive tribes to the common law to the Constitution of the United States. At the same time, human ambition and invention have created new uncertainties requiring yet further technological and legal adaptations.

## VI. CONCLUSION

It has been the good fortune of those living in certain parts of the world to have inherited the English common law. Some, particularly in the American academy, will object that this is an elitist, or culturist or even racist assertion. But the evidence is persuasive that the principle of the rule of law, whether implemented through the common law or some other legal regime, is more important than any other social institution in explaining why nations succeed.<sup>61</sup> To be sure, some nations have the advantage of more abundant natural resources or more favorable climates, but there are more than enough failed nations with such natural advantages to prove the necessity of also having good social institutions.

Americans have long preached the importance of the rule of law and have made many efforts to induce others to adopt institutions founded on that guarantee against tyranny, but experience demonstrates that institution-

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<sup>61</sup> See DARON ACEMOGLU & JAMES ROBINSON, *WHY NATIONS FAIL: THE ORIGINS OF POWER, PROSPERITY, AND POVERTY* (2012). The authors argue that institutions and centrally the rule of law are critical to national economic success.

al change comes slowly if at all.<sup>62</sup> That is why it is probably more accurate to think of the Anglo-American experience as the result of good fortune than of good planning or design. In the case of the common law, our predecessors may have been wise enough to recognize that the common law method served both private and public interests, or perhaps it was pure fortuity that gradual adaptation to changing private interests served the public good. Whether we flatter ourselves a bit or give credit to invisible hands, we must now have the wisdom to know that judge-made law is unlikely to be the foundation of our future successes.

The stability that has allowed humans to prosper while retaining their independence, indeed to prosper because of their independence, is not unlike the stability of an ecosystem or a market place. A species finds success in a particular ecosystem, but there is constant incremental change that may result, over decades or centuries, in the species adapting, migrating, expanding or declining. A producer of goods or services finds success in the market place, but new inventions and changing consumer tastes and capacity will require the producer to adapt, or fail. In both of these systems an always evolving equilibrium is achieved through incremental adjustments, not by wise officials or even higher authority.

As for law, although there is no denying that the common law has been overwhelmed by a sea of statutes and regulations, we would do well to recognize that the method of the common law has been remarkably successful in keeping pace with human requirements from its ancient origins in custom to its modern rules of property and liability. Although latter-day environmentalist devotees of the common law would have courts destabilize vested property rights in the name of the public good, it is not too late to recognize that the traditional demand side method of the common law serves liberty, efficiency, and the environment.

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<sup>62</sup> Illustrative is the Soviet enactment, shortly after the 1917 Russian Revolution, of a law replacing fault-based liability with a system based purely on compensation without regard for fault. Few in a society accustomed to fault-based liability accepted the change and the fault-based system was eventually restored. See James L. Huffman, *Government Liability and Natural Hazard Mitigation in Japan, the Soviet Union, China, New Zealand and the United States*, 1 INT'L J. OF MASS EMERGENCIES & DISASTERS 379, 384-85 (1983).

## AUSTRIAN ECOLOGY: RECONCILING DYNAMIC ECONOMICS AND ECOLOGY

*Shawn E. Regan\**

Nature is not more complex than we think, but more complex than we can think.

—Frank Egler<sup>1</sup>

### INTRODUCTION

The fields of economics and ecology largely developed independently of one another. Economic theories of human action seldom concern themselves with ecological theories of nonhuman interactions, nor do ecologists concern themselves with economic theories of human action. Each defines their field so as to exclude the other. For the ecologist, human action is considered a disrupter of natural ecosystem processes. For the economist, ecosystems are important only insofar as they affect the fundamental constraints of resource scarcity. Such a division has prevented ecologists and economists from integrating their understandings of the interrelationship between human action and the natural world.

Despite their different scopes of study, the development of mainstream ecological theory in many ways parallels the development of neoclassical economic theory. Both interpret the complex interactions of individuals through the lens of equilibrium analysis. The models used to understand ecosystems and economics are based on the assumption that each system achieves or exists in balance with itself. Ecologists, for instance, traditionally rely on models that assume an inherent balance of nature. Likewise, neoclassical economists study markets as if they exist in or rapidly attain a state of equilibrium. The assumptions of general equilibrium in economic theory are comparable to the balance-of-nature assumption that underlies most ecological theories. Over the last century, the standard practice of each field has been to formalize these equilibrium foundations into abstract mathematical theories. These equilibrium assumptions have had important implications for both economic and environmental policy.

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<sup>1</sup> FRANK EDWIN EGLER, *THE NATURE OF VEGETATION, ITS MANAGEMENT AND MISMANAGEMENT: AN INTRODUCTION TO VEGETATION SCIENCE* 2 (1977).

In addition to their parallel developments, modern ecological theory and neoclassical economic theory have received remarkably similar critiques from within of their assumptions and methodologies. Recent research in ecology has challenged traditional ecological theory in a manner similar to the Austrian critique of neoclassical economics. Ecologists are increasingly rejecting equilibrium analysis and adopting a view of ecosystem dynamics that is similar in many ways to the Austrian theory of the market process. According to each critique, a focus on points of equilibrium ignores the realities of human action and ecological interactions and distracts researchers from the dynamic forces that shape markets and ecosystems.

The purpose of this paper is to explore the linkages between ecology and economics through the lens of Austrian economics. Drawing upon recent theoretical advancements in ecological theory, I consider how these ideas relate to the insights of Austrian economists and discuss the implications of a more dynamic and integrated perspective of economics and ecology. By linking the two together, I aim to address the interconnectedness between human action and the natural world and attempt to reconcile dynamic economics and ecology through a new lens of what I will call “Austrian ecology.”

Reconciling economics and ecology is important, if not essential, in light of the increasing recognition of the extent to which humans influence the environment. These effects go beyond anthropogenic global climate change. More than at any point in the history of ecology, scientists are concluding that human action cannot readily be separated from the natural world.<sup>2</sup> Research in paleoecology and other fields is revealing that landscapes once thought to be uninfluenced by humans were in fact dramatically affected by indigenous human action.<sup>3</sup> A new generation of conservationists is increasingly rejecting the idea of pristine nature as a worthy or practical conservation goal and adopting a more nuanced vision of the environment that includes human action.<sup>4</sup> Scientists have even proposed—and are in the process of considering—changing the current geologic era from the Holocene to the Anthropocene (the “age of man”) to reflect the magnitude of human influences on the natural world.<sup>5</sup> The Anthropocene concept

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<sup>2</sup> See, e.g., Peter Kareiva & Michelle Marvier, *What is Conservation Science?*, 62 *BIOSCIENCE* 962, 962 (2012) (“Today, one of the most important intellectual developments is the recognition that ecological dynamics cannot be separated from human dynamics . . .”).

<sup>3</sup> See, e.g., CHARLES C. MANN, 1491: NEW REVELATIONS OF THE AMERICAS BEFORE COLUMBUS 319 (2005) (discussing the Amazon rainforest).

<sup>4</sup> Peter Kareiva, Michelle Marvier & Robert Lalasz, *Conservation in the Anthropocene: Beyond Solitude and Fragility*, 2 *BREAKTHROUGH J.* 29 (2012) [hereinafter Kareiva et al., *Conservation in the Anthropocene*]. See generally EMMA MARRIS, *RAMBUNCTIOUS GARDEN: SAVING NATURE IN A POST-WILD WORLD* (2011).

<sup>5</sup> See Paul J. Crutzen & Eugene F. Stoermer, *The “Anthropocene,”* *IGBP NEWSL.*, May 2000, at 16; Will Steffen et al., *The Anthropocene: Are Humans Now Overwhelming the Great Forces of Na-*

makes linking economics and ecology a necessity, because virtually all ecological activity is influenced in some way by human action.

An Austrian ecological perspective implies a new framing for questions of environmental policy, one that should be considered by ecologists and economists alike. Once we accept that nature is dynamic and profoundly shaped by and connected to human action, we are compelled to see environmental problems through a different lens. In this view, environmental problems cannot be thought of as simply the consequence of human violations on the balance of nature. A new generation of ecologists has rejected the notion of a natural harmony in ecosystems. Nor can environmental problems be solved by simply separating the natural environment from human influences. The notion of the Anthropocene suggests that doing so is impractical or even impossible. Instead, environmental problems become questions of how to resolve competing human demands on an ever-changing natural world. The central environmental question, then, is how the institutions that govern these competing demands connect dynamic human action to dynamic nature.

The remainder of this paper proceeds as follows: Part I explores nature as a dynamic process and discusses how ecologists are rethinking the traditional equilibrium ecological framework. This new ecological perspective increasingly considers the impacts of human action as a part of or within the context of ever-changing ecological dynamics. Nevertheless, the traditional assumptions of equilibrium in nature still serve as the foundation of many environmental policies today. Part II traces the linkages between a dynamic view of ecology and Austrian economic theory. Indeed, the dynamic ecology perspective is challenging traditional ecological paradigms in much the same way that the Austrian school has challenged mainstream economic theory. Part III concludes by discussing the implications of these linkages and considers whether a more encompassing theory of dynamic economic and ecological processes, or “Austrian ecology,” is a useful idea.

## I. DYNAMIC ECOLOGY

Yosemite is best known for its scenic grandeur. Long before the region was set aside for protection, visitors marveled at its sheer granite walls, ancient trees, and towering waterfalls. Carleton Watkins’ famous photograph of El Capitan, a 3,000-foot rock extending from the floor of

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*ture?*, 36 *AMBIO* 614-21 (2007). See generally Jan Zalasiewicz et al., *Are We Now Living in the Anthropocene?*, *GSA TODAY*, Feb. 2008, at 4 (making the case that sufficient evidence exists to recognize the Anthropocene as a new geological epoch); Paul Voosen, *Geologists Drive a Golden Spike Toward Anthropocene’s Base*, *GREENWIRE* (Sept. 17, 2012), <http://www.eenews.net/stories/1059970036> (describing how the International Commission on Stratigraphy is considering whether to formally propose the Anthropocene as a new epoch).

Yosemite Valley, was especially influential in attracting national attention to the area. The photograph, taken in 1868, reveals a valley sparsely populated with trees against the backdrop of El Capitan's granite face.<sup>6</sup>

Visitors to Watkins' spot today, however, no longer share his view. When the photograph was recreated in 1944, El Capitan was hardly visible through the encroaching forest.<sup>7</sup> Now the view is entirely obstructed by trees. Another photograph taken by Watkins in 1866 reveals a similar story. From Union Point, high above Yosemite Valley, Watkins' image shows the valley thinly scattered with trees. Later photographs from Union Point demonstrate just how much Yosemite Valley has changed.<sup>8</sup> The meadows that once offered stunning vistas have been almost completely swallowed by the forest.<sup>9</sup> The oak woodlands that dotted the landscape have been replaced by more aggressive, shade-tolerant conifer tree species.<sup>10</sup> The valley that Watkins captured with his camera more than a century ago had dramatically changed.<sup>11</sup>

In response to this enormous increase in forest growth, the National Park Service (NPS) initiated a plan in 2011 to cut thousands of trees in Yosemite National Park.<sup>12</sup> Currently underway, the plan attempts to restore the park's historic scenic vistas by clearing trees and other vegetation from nearly 100 viewsheds that have been obscured or completely hidden by the forest.<sup>13</sup> Arguably, the NPS's mandate "to conserve the scenery" and "to

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<sup>6</sup> Carleton E. Watkins, *Tutocanula, El Capitan, 3600 feet*, CARLETONWATKINS.ORG, <http://www.carletonwatkins.org/getviewbyid.php?id=1001174>.

<sup>7</sup> See *Scenic Vista Management Plan—Yosemite National Park*, NAT'L PARK SERV., <http://www.nps.gov/yose/parkmgmt/vista.htm> (last updated May 3, 2015).

<sup>8</sup> See Carleton E. Watkins, *View from Union Point, 1866*, SAN JOAQUIN VALLEY LIBRARY SYS. (1866), <http://content.cdlib.org/ark:/13030/kt6d5nc840/?docId=kt6d5nc840&layout=printable-details>; Robert P. Gibbens, *View from Union Point, 1961*, SAN JOAQUIN VALLEY LIBRARY SYS. (1961), <http://content.cdlib.org/ark:/13030/kt2s201931/?docId=kt2s201931&layout=printable-details>; see also NAT'L PARK SERV., SCENIC VISTA MANAGEMENT PLAN FOR YOSEMITE NATIONAL PARK: FINDING OF NO SIGNIFICANT IMPACT (2011), available at <http://www.nps.gov/yose/parkmgmt/upload/Scenic-Vista-Mgt-Plan-FONSI.PDF>.

<sup>9</sup> See NAT'L PARK SERV., SCENIC VISTA MANAGEMENT PLAN FOR YOSEMITE NATIONAL PARK: ENVIRONMENTAL ASSESSMENT I-3 (2010), available at [http://www.nps.gov/yose/parkmgmt/upload/SVMP\\_YOSE\\_EA.pdf](http://www.nps.gov/yose/parkmgmt/upload/SVMP_YOSE_EA.pdf) [hereinafter ENVIRONMENTAL ASSESSMENT] ("There are few places on the Valley floor from which upper and lower Yosemite Falls are visible. The 'Postage Stamp' vista of El Capitan, made famous in the 1934 one-cent postage stamp engraving from an 1868 Carleton Watkins photograph, is now obscured by conifers . . .").

<sup>10</sup> *Id.*

<sup>11</sup> See generally ROBERT P. GIBBENS & HAROLD F. HEADY, THE INFLUENCE OF MODERN MAN ON THE VEGETATION OF YOSEMITE VALLEY 36 (1964) (demonstrating in photographs and text the dramatic changes in vegetation across Yosemite).

<sup>12</sup> ENVIRONMENTAL ASSESSMENT, *supra* note 9, at I-1–I-2.

<sup>13</sup> See NAT'L PARK SERV., SCENIC VISTA MANAGEMENT PROGRAM WORK PLAN 2014 (2014), available at <http://www.nps.gov/yose/parkmgmt/upload/2014-Scenic-Vista-Work-Plan.pdf>.

provide for the enjoyment of the same” compelled the agency to actively intervene to preserve Yosemite’s scenic vistas.<sup>14</sup>

As Watkin’s photographs suggest, throughout much of the Yosemite region, the landscape today is much different from the one seen by early preservationists. “The inviting openness of the Sierra woods is one of their most distinguishing characteristics,” wrote John Muir in 1894.<sup>15</sup> Frederick Law Olmsted’s report on Yosemite in 1865 described “miles of scenery” and “the most tranquil meadows,” creating what he called “the greatest glory of nature.”<sup>16</sup> Since then, the National Park Service estimates 75 to 90 percent of those meadows have been lost to the forest.<sup>17</sup>

The scenery that preservationists sought to protect was a landscape largely shaped by human influence.<sup>18</sup> Prior to the creation of the park, Native Americans regularly set fire to Yosemite Valley to clear forests, maintain open meadows, and grow food.<sup>19</sup> Frequent fires promoted the growth of scattered stands of black oaks, from which Indians gathered acorns.<sup>20</sup> The grassy meadows were seen by early white settlers, who brought with them livestock to graze in the open fields.<sup>21</sup> In an important sense, the tranquil meadows seen by Muir and Olmsted were as much the product of human action as they were the greatest glory of nature.

If the Yosemite depicted in early photographs was the product of human influence, then to what state should it be managed today? Should park managers maintain Yosemite in the state that existed when the park was first created? Or should the valley be managed to an even earlier era, one that existed before Indians began impacting the land? The *Leopold Report*, authored by a group of scientists in 1963 to guide wildlife management in national parks, stated that parks should be maintained “in the condition that

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<sup>14</sup> The National Park Service Organic Act directs the National Park Service “to conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” See 54 U.S.C. § 100101. The Statute also states that the director of the NPS “may . . . dispose of timber in cases where, in the judgment of the Secretary, the cutting of timber is required to control attacks of insects or diseases or otherwise conserve the scenery or the natural or historic objects in any System unit.” 54 U.S.C. § 100753.

<sup>15</sup> JOHN MUIR, *THE MOUNTAINS OF CALIFORNIA* 140 (2d ed. 1901) (1894), available at [http://vault.sierraclub.org/john\\_muir\\_exhibit/writings/the\\_mountains\\_of\\_california/chapter\\_8.aspx](http://vault.sierraclub.org/john_muir_exhibit/writings/the_mountains_of_california/chapter_8.aspx).

<sup>16</sup> Frederick Law Olmsted, *The Yosemite Valley and the Mariposa Big Tree Grove*, in *AMERICA’S NATIONAL PARK SYSTEM: THE CRITICAL DOCUMENTS* 12, 16 (Lary M. Dilsaver ed., 1994).

<sup>17</sup> *Shifting Views on Fire—Yosemite National Park*, NAT’L PARK SERV., <http://www.nps.gov/yose/parkmgmt/fire-history.htm> (last updated May 3, 2015) (noting that “as much as 75 to 90 percent of meadows [in Yosemite Valley today] have been lost to tree encroachment”).

<sup>18</sup> See generally GIBBENS & HEADY, *supra* note 11.

<sup>19</sup> ALFRED RUNTE, *YOSEMITE: THE EMBATTLED WILDERNESS* 38-39 (1993).

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

prevailed when the area was first visited by the white man.”<sup>22</sup> Where this was not possible, the report concluded, a “reasonable illusion of primitive America could be recreated, using the utmost in skill, judgment, and ecologic sensitivity.”<sup>23</sup> But is such a “reasonable illusion” even possible? What would such a landscape even look like?

The forests of Yosemite are just one illustration of how the idea of the balance of nature pervades the way we think about the environment. Indeed, for much of their history ecologists have tended to study ecological systems as if they achieved equilibria. Although equilibrium models are analytically appealing, they have proven to be inconsistent with the way ecosystems function in reality. By focusing on equilibrium conditions, ecologists have often overlooked the dynamic natural and human processes that shape ecosystems.

#### A. *Discordant Harmonies and the Balance of Nature*

The idea of stability and equilibrium in nature has deep historical roots, dating back at least to the ancient Greeks.<sup>24</sup> Writing in the nineteenth century, George Perkins Marsh, one of America’s first environmentalists, expressed the prevailing view in this way: “Nature, left undisturbed, so fashions her territory as to give it almost unchanging permanence of form, outline, and proportion, except when shattered by geological convulsions . . . .”<sup>25</sup> Even in such rare events as geological convulsions, nature “sets herself at once to repair the superficial damage, and to restore, as nearly as practicable, the former aspect of her dominion.”<sup>26</sup> Any changes that do occur are so slow that for all practical purposes nature “may be regarded as constant and immutable.”<sup>27</sup> Were it not for man’s influence, Marsh writes, nature “would have been constant in type, distribution, and proportion, and the physical geography of the earth would have remained undisturbed for indefinite periods.”<sup>28</sup>

The emergence of the science of ecology in the early twentieth century rejected this pure expression of stable nature undisturbed by humans. Clearly, nature did not always remain the same. It often evolved, even without significant human influence. Internal forces other than “geological

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<sup>22</sup> A. STARKER LEOPOLD, STANLEY A. CAIN, CLARENCE M. COTTAM, IRA N. GABRIELSON & THOMAS L. KIMBALL, NAT’L PARK SERV., WILDLIFE MANAGEMENT IN THE NATIONAL PARKS 3 (1963).

<sup>23</sup> *Id.* at 4.

<sup>24</sup> See Frank N. Egerton, *Changing Concepts of the Balance of Nature*, 48 Q. REV. OF BIOLOGY 322 (1973) (offering a detailed history of the balance of nature).

<sup>25</sup> GEORGE PERKINS MARSH, *MAN AND NATURE: OR, PHYSICAL GEOGRAPHY AS MODIFIED BY HUMAN ACTION* 27 (Charles Scribner, 1864).

<sup>26</sup> *Id.* at 27.

<sup>27</sup> *Id.* at 34.

<sup>28</sup> *Id.* at 38.

convulsion” exerted influence on natural communities. Beavers, for example, altered their landscapes. Temperatures fluctuated and droughts occasionally affected entire regions. Fires and floods at times dramatically changed the composition of species that could survive in certain areas. The vision of a completely static and balanced nature undisturbed by humans espoused by Marsh was certainly false.

In place of Marsh’s simple vision of unchanging nature, however, the nascent field of ecology adopted the idea of ecological succession. Led by Eugenius Warming, a Danish plant geographer and author of *The Oecology of Plants: An Introduction to the Study of Plant Communities*, in 1909, scientists began to consider how plant communities transitioned from one community to another in a given area, ultimately arriving at a “climax” state or final community. In this view, nature was not necessarily unchanging, apart from human activity. It could be affected by drought, fires, and other natural forces, but it would progress through various stages of succession until it reached its final “climax” formation.<sup>29</sup>

Although Warming’s idea of ecological succession implied at least some form of change, it was ultimately consistent with the notion of the balance of nature. The climax equilibrium was the ultimate equilibrium, perfectly balanced and self-perpetuating unless disturbed. As the science of ecology progressed, various ecologists extended Warming’s ideas of succession further into the scientific parlance. Most notable was Frederic Clements of the University of Nebraska, whose influence on the emerging field of ecology in the early twentieth century is difficult to overstate. According to Oxford ecologist A.G. Tansley, Clements was “by far the greatest individual creator of the modern science of vegetation.”<sup>30</sup>

Like Warming, Clements thought that ecosystems developed through a predictable succession of stages until they reached a climax state that persists indefinitely unless disturbed.<sup>31</sup> The exact outcome of this climax state was ultimately determined by the climate.<sup>32</sup> In every given climate, there existed a mature climax stage or equilibrium. This process of succession could be plotted by scientists for each climatic region, and once the climax stage was attained, it would remain in balance with itself, barring any external disturbance or major climatic shift.

The other influential facet of Clements work was his organismic view of plant formation. He considered the evolution of climax plant formations

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<sup>29</sup> DONALD WORSTER, *NATURE’S ECONOMY: A HISTORY OF ECOLOGICAL IDEAS*, 198-202 (2d ed. 1994). See generally EUG. WARMING, *OECOLOGY OF PLANTS: AN INTRODUCTION TO THE STUDY OF PLANT COMMUNITIES* (1909).

<sup>30</sup> WORSTER, *supra* note 29, at 209.

<sup>31</sup> Frederic E. Clements, *Nature and Structure of the Climax*, 24 J. OF ECOLOGY 252, 256 (1936).

<sup>32</sup> *Id.* at 253 (noting that “the climax constitutes the major unit of vegetation and as such forms the basis for the natural classification of plant communities”).

as a kind of “complex organism” of its own.<sup>33</sup> Historian Donald Worster describes Clements’ “underlying, almost metaphysical faith that the development of vegetation must resemble the growth process of an individual plant or animal organism.”<sup>34</sup> This “superorganism” was “of a higher order than an individual geranium, robin or chimpanzee,” according to Clements.<sup>35</sup> To Clements, a plant community was best understood as a collective organism rather than as an individual species. Entire communities evolved together through stages of succession into a mature adult form determined by conditions of a given climate.

The idea of Clementsian succession had a far-reaching impact on conservation and environmental values in the twentieth century. The idea of an equilibrium climax forest left little room for humans, other than as a disrupter of nature’s final balance.<sup>36</sup> It implied that human action upset a predetermined balance that nature tended toward and a final state that would persist otherwise. “The notion of a superior climax state gave a scientific validation to the conservationist’s case against the machine and the farmer,” according to Worster, serving as “the yardstick by which man’s intrusions into nature could be measured.”<sup>37</sup>

Clements’ ideas of a climax state and “superorganisms” were quickly challenged. In 1926, Henry Gleason of the University of Michigan published *The Individualistic Concept of the Plant Association*, a direct challenge to Clements’ organismic notion of plant communities.<sup>38</sup> As the title implies, Gleason argued in favor of a more individualistic view of nature. In Gleason’s view, plants formations “are mere accidental groupings, each the result of unique circumstances and too loosely related to be likened to an organized being,” writes Worster.<sup>39</sup> Each species responds individually to its environmental conditions and the composition of species on a landscape changes continuously across time and space. The characterization by Clements of plant communities as collective superorganisms was thus a useless abstraction from the actual workings of ecosystems described in Gleason’s “individualistic” conception of nature.

Like Gleason, A.G. Tansley refused to drink the “pure milk of the Clementsian word.”<sup>40</sup> Tansley claimed that in any given region, there may be a variety of outcomes that could be considered climax states. Why should ecologists focus their attention on the equilibrium state of the climax

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<sup>33</sup> FREDERIC E. CLEMENTS, *PLANT SUCCESSION: AN ANALYSIS OF THE DEVELOPMENT OF VEGETATION*, 141 (1916).

<sup>34</sup> WORSTER, *supra* note 29, at 211.

<sup>35</sup> *Id.* (internal quotation marks omitted).

<sup>36</sup> *Id.* at 240.

<sup>37</sup> *Id.* at 234, 242.

<sup>38</sup> Henry A. Gleason, *The Individualistic Concept of the Plant Association*, 53 *BULL. OF THE TORREY BOTANICAL CLUB* 7 (1926).

<sup>39</sup> WORSTER, *supra* note 29, at 239.

<sup>40</sup> *Id.*

forest, for example? But of more concern to Tansley was the separation of human activity from the ideas of plant succession and climax formation.<sup>41</sup> Did human actions not help create climax systems? Is there a meaningful difference between a balance achieved by nature alone and a balance determined by man? Tansley thought the idea of climax formation should consider both possibilities.

Despite the individualistic view of Gleason and the anthropogenic view of Tansley, the modern science of ecology developed in earnest with Eugene Odum and systems ecology. Considered a pioneer of modern ecosystem ecology, Odum used different language than Clements, but “he did not depart from Clements’ notion that the law of organic nature was to bring order and harmony out of the chaotic materials of existence,” according to Worster.<sup>42</sup> Succession, Odum wrote in 1969, is “an orderly process of community development that is reasonably directional and, therefore, predictable” and “culminates in a stabilized ecosystem.”<sup>43</sup> In the 1960s and 1970s, systems ecology focused on the energy and nutrient flows through ecosystems, borrowing terms such as “producers” and “consumers” from economics to model inputs and outputs. The systems approach assumed a balancing out between various producers and consumers within ecosystems, adopting a similar equilibrium framework that had simultaneously emerged in the economics profession. Still, Odum’s science of ecology largely ignored human actions as a relevant consideration other than as disrupters of nature’s balance.<sup>44</sup>

In the latter part of the twentieth century, however, an internal critique of modern ecology began to emerge. Ecological research increasingly found that the equilibrium models theorized by early twentieth-century ecologists did not adequately explain the dynamic interactions that occur within ecosystems. Over the last several decades, some ecologists began to explicitly challenge the notion of a balance of nature that underlies most traditional ecological theories. “Another generation of ecologists began to

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<sup>41</sup> *Id.* at 239-40.

<sup>42</sup> *Id.* at 367.

<sup>43</sup> DANIEL B. BOTKIN, *THE MOON IN THE NAUTILUS SHELL: DISCORDANT HARMONIES RECONSIDERED* 75 (2012) [hereinafter BOTKIN, *THE MOON*]; see also Robert V. O’Neill, *Is It Time to Bury the Ecosystem Concept? (With Full Military Honors, Of Course!)*, 82 *ECOLOGY* 3275, 3275-76 (2001). As O’Neill explains,

Systems Analysis dealt with complex systems as interconnected components with feedback loops that stabilized the system at a relatively constant equilibrium point. Systems Analysis can be seen underlying E. P. Odum’s . . . definition of the ecosystem as a “. . . natural unit that includes living and nonliving parts interacting to produce a stable system in which the exchange of materials between the living and nonliving parts follows circular paths . . .”

O’Neill, *supra*, at 3275-76 (internal citation omitted).

<sup>44</sup> Odum seemed to later contradict his earlier theory, writing in 1992 that “an ecosystem is a thermodynamically open, far from equilibrium, system,” reflecting a broader paradigm shift among ecologists at the time. Eugene P. Odum, *Great Ideas in Ecology for the 1990s*, 40 *BIOSCIENCE* 542, 542 (1992).

question all the older ideas, theories, and metaphors, even to assert that nature is inherently unsettled,” explains Worster.<sup>45</sup>

One question in particular was whether the outcome of ecological succession was a stable equilibrium or not. A study by William Drury and Ian Nisbet, published in 1973, revived Gleason’s individualistic conception of nature.<sup>46</sup> The authors studied New England’s temperate forests and concluded that the process of ecological succession did not lead anywhere in particular and never reached a point of equilibrium. None of Clements’ or Odum’s criteria for a mature “climax” ecosystem emerged. Instead a “shifting mosaic” was observed.<sup>47</sup> Increasingly, ecologists rejected assumptions of steady-state equilibria and instead began to focus on “disturbances,” both natural and man-made, as part of an ever-changing mosaic of environmental conditions.<sup>48</sup>

The critique of equilibrium ecology is most forcefully made by ecologist Daniel Botkin. In his influential book, *Discordant Harmonies: A New Ecology for the Twenty-First Century*, Botkin documents how the conventional view of a balance of nature apart from human action is unsupported by the evidence. In reality, Botkin argues, “nature undisturbed is not constant in form, structure, or proportion, but changes at every scale of time and space.”<sup>49</sup> According to Botkin,

the true idea of a harmony of nature . . . is by its very essence discordant, created from the simultaneous movements of many tones, the combination of many processes flowing at the same time along various scales, leading not to a simple melody but to a symphony at some times harsh and at some times pleasing.<sup>50</sup>

This is in sharp contrast to the Clementsian faith in a predictable endpoint of succession, or what Botkin characterizes as the belief “that nature’s melody leads to one final chord that sounds forever.”<sup>51</sup>

Consider the wilderness of the Boundary Waters region, for example, located on the Canadian border of Minnesota. Using pollen records deposited in nearby lakes, scientists now know that since the end of the last ice age, the forest passed from tundra, to spruce, to pine, to birch and alder, and

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<sup>45</sup> WORSTER, *supra* note 29, at 389.

<sup>46</sup> William H. Drury & Ian C. T. Nisbet, *Succession*, 54 J. ARNOLD ARBOR 331 (1973).

<sup>47</sup> WORSTER, *supra* note 29, at 391 (“The forest, they insisted, no matter what its age, was nothing but an erratic, shifting mosaic of trees and other plants.”).

<sup>48</sup> See MARRIS, *supra* note 4, at 26. In 2004, a group of scientists recommended ecologists reconsider the application of equilibrial perspectives to ecological systems, explaining, “this idea has been rejected on the basis of the weight of evidence.” Gary E. Belovsky et al., *Ten Suggestions to Strengthen the Science of Ecology*, 54 BIOSCIENCE 345, 348 (2004).

<sup>49</sup> DANIEL B. BOTKIN, *DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY* 62 (1990) [hereinafter BOTKIN, *DISCORDANT HARMONIES*].

<sup>50</sup> *Id.* at 25.

<sup>51</sup> *Id.* at 116.

then back to spruce and pine, changing composition every few thousand years. These changes occurred even though, for much of that time, the area had largely been spared from the impact of humans. Likewise, the traditional logistic growth curves and Lotka-Volterra models of oscillating predator-prey relationships have never been observed to fluctuate as classical equilibrium models would suggest.<sup>52</sup> In fact, as Botkin explains, the only instance in which such Lotka-Volterra stability has been observed is in a laboratory using single-celled microbes under extremely controlled conditions.<sup>53</sup>

In Botkin's view, these equilibrium constructs reduce the biological world to a mechanistic system:

Strictly speaking, the logistic can accurately describe only a population to which all required resources are available at a constant rate, and whose members are exposed to all toxins (except those generated by themselves) at a constant rate. A logistic moose responds instantaneously to changes in the size of the population; there is no history, no time lags, no seasons; a logistic moose has no fat.<sup>54</sup>

As ecologist Frank Golley describes, "In the ecosystem model, species acted abstractly, like robots."<sup>55</sup> With such a mechanistic view of nature, it is difficult, if not impossible, not to ascribe a certain purposefulness to ecosystem processes.<sup>56</sup> Botkin criticizes this teleological element of ecology as a persistent and well-known flaw in ecological analysis as well as in non-scientific discussions of environmental problems.<sup>57</sup>

The changes that have occurred in Yosemite Valley since Carleton Watkins' photographs demonstrate, in part, the dynamic processes that are inherent within ecosystems. As Botkin argues, nature undisturbed by man is not a "Kodachrome still-life," but rather "a moving picture show," continually changing "at every scale of time and space."<sup>58</sup> Even in relatively wild places such as Yosemite and Yellowstone, ecosystems are constantly in flux.<sup>59</sup> Tree-ring studies suggest that Yellowstone's forest ecosystem

<sup>52</sup> *Id.* at 36. The Lotka-Volterra equations, named after two of the first scientists to apply this type of theory to population growth, describe the relationship between predator and prey.

<sup>53</sup> *Id.* at 56-60.

<sup>54</sup> *Id.* at 36-37.

<sup>55</sup> FRANK B. GOLLEY, *A HISTORY OF THE ECOSYSTEM CONCEPT IN ECOLOGY* 106 (1993).

<sup>56</sup> This is perhaps most evident in the metaphor of Gaia as Mother Earth, which is still common in modern discussion of global environmental problems. *E.g.*, JAMES E. LOVELOCK, *GAIA: A NEW LOOK AT LIFE ON EARTH* (1979).

<sup>57</sup> BOTKIN, *THE MOON*, *supra* note 43, at 136-37.

<sup>58</sup> BOTKIN, *DISCORDANT HARMONIES*, *supra* note 49, at 6.

<sup>59</sup> J.A. Lutz, J.W. van Wagtenonk & J.F. Franklin, *Twentieth-Century Decline of Large-Diameter Trees in Yosemite National Park, California, USA*, 257 *FOREST ECOLOGY AND MGMT.* 2296-2307 (2009) (noting that "far from being the most unchanging component of Yosemite forests, large-diameter tree populations are undergoing directional change on multi-decadal timescales").

lacks a single steady state.<sup>60</sup> Wildlife populations, as well, have historically lacked stability.<sup>61</sup> Whether these dynamic forces are simply the result of ever-changing ecosystem processes or are driven primarily by human influence is often not clear. As scientists are discovering, the natural world cannot easily be separated from human action. The dynamic processes we see in nature are closely linked to ever-changing human actions, which make up another important piece of the shifting mosaic of human-nature interactions.

### B. *Ecology in the Anthropocene*

When Maria Lebrado was a child, her Ahwahneechee tribe was driven out of Yosemite Valley by the Mariposa Battalion. Seventy-eight years later, in 1929, she returned for the first time. A guide later recalled her reaction: “Two young men drove us over the Valley she had not seen since her childhood. The wide open meadow of her day was covered with trees and shrubs. She shook her head, saying, ‘Too dirty; too much bushy.’”<sup>62</sup>

The Yosemite scenery that early preservationists sought to protect was dramatically influenced by humans. “Much of the landscape in California that so impressed early writers, photographers, and landscape painters was in fact a cultural landscape, not the wilderness they imagined,” writes ethnobiologist M. Kat Anderson.<sup>63</sup> “While they extolled the ‘natural’ qualities of the California landscape, they were really responding to its human influence.”<sup>64</sup> Early preservationists such as John Muir objected to Indians’ use of fire, a position that would later develop into federal policies of fire suppression and an emerging conservationist vision of nature apart from man.<sup>65</sup>

It was not until the 1970s that the National Park Service recognized the folly of its fire suppression policies. By then an enormous fuel load had accumulated in Yosemite. Forest growth transformed meadows into dense stands of trees. Giant sequoias were no longer regenerating, having evolved to rely on disturbances such as fire.<sup>66</sup> Many of the viewsheds that

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<sup>60</sup> William H. Romme, *Fire and Landscape Diversity in Subalpine Forests of Yellowstone National Park*, 52 *ECOLOGICAL MONOGRAPHS* 199 (1982).

<sup>61</sup> See generally BOTKIN, *THE MOON*, *supra* note 43, at 43-67; *YELLOWSTONE’S WILDLIFE IN TRANSITION* (P.J. White, Robert A. Garrott & Glenn E. Plumb eds., 2013).

<sup>62</sup> See MRS. H.J. TAYLOR, *THE LAST SURVIVOR* (1932), available at [http://www.yosemite.ca.us/library/the\\_last\\_survivor/](http://www.yosemite.ca.us/library/the_last_survivor/).

<sup>63</sup> M. KAT ANDERSON, *TENDING THE WILD: NATIVE AMERICAN KNOWLEDGE AND THE MANAGEMENT OF CALIFORNIA’S NATURAL RESOURCES* 158 (2005).

<sup>64</sup> *Id.*

<sup>65</sup> SHEPARD KRECH, *THE ECOLOGICAL INDIAN: MYTH AND HISTORY* 102 (1999) (noting that John Muir regarded fire as “the great master-scurge of the forest” and Indians as destructive in their use of it).

<sup>66</sup> Sequoia seedlings were only sprouting where dirt roads had opened the canopy and allowed sunlight to reach the exposed soil. See THOMAS H. HARVEY, HOWARD S. SHELLHAMMER & RONALD E.

Muir and other early preservationists saw had vanished, and the region became prone to larger, more catastrophic wildfires. In response, the National Park Service initiated a prescribed fire program to replicate the fires of the past through controlled burning. During the last 40 years, controlled fires burned between 12,200 and 15,600 acres in Yosemite each decade.<sup>67</sup> But this was far less than the region's historic fire regime, in which 16,000 acres may have burned each year prior to the era of fire suppression.<sup>68</sup>

In addition to nature's ever-changing discordant harmonies, as Botkin described them, the notion of the Anthropocene is evident in the photographs of Yosemite Valley. There, the effects of natural ecosystem dynamics cannot be easily distinguished from those of human action. The two are intertwined closely together. What is the true character of Yosemite undisturbed by human action? Is it dense forests or open meadows? We cannot readily say. In many ways the only Yosemite we have ever known is one created by the actions—or deliberate inactions—of people.

Virtually all of the world's landscapes have been shaped in some way by human action. Just as Yosemite Valley was shaped by Indians, humans have been impacting their environment for millennia.<sup>69</sup> Long before the U.S. federal government recognized the advantages of letting some forest fires burn, Indians were burning the landscape to enhance wildlife habitat.<sup>70</sup> Recent evidence suggests that the American wilderness that Columbus, Lewis and Clark, and other early explorers witnessed was dramatically shaped by humans—both by native societies themselves and, later, by the impacts resulting from the spread of European diseases.<sup>71</sup> In the American West, as Charles Mann explains, it is likely that “a substantial portion of the giant grassland celebrated by cowboys was established and maintained by the people who arrived there first.”<sup>72</sup> Ethnologist Dale Lott puts it more plainly. “When Lewis and Clark headed west from [St. Louis],” he writes,

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STECKER, GIANT SEQUOIA ECOLOGY: FIRE AND REPRODUCTION (1980), available at [http://www.nps.gov/parkhistory/online\\_books/science/12/index.htm](http://www.nps.gov/parkhistory/online_books/science/12/index.htm).

<sup>67</sup> See Prescribed Fire History Map—Yosemite National Park, NAT'L PARK SERV., <http://www.nps.gov/yose/parkmgmt/rx-fire-history.htm> (last visited Sept. 29, 2014).

<sup>68</sup> *Shifting Views on Fire—Yosemite National Park*, *supra* note 17.

<sup>69</sup> Erle C. Ellis, et al., *Used Planet: A Global History*, 110 PROC. NAT'L ACAD. SCI. 7978, 7978 (2013) (explaining that “[human] land use has been extensive and sustained for millennia” and that “relatively small human populations likely caused widespread and profound ecological changes more than 3,000 [years] ago”).

<sup>70</sup> KRECH, *supra* note 65, at 112.

<sup>71</sup> MANN, *supra* note 3, at 360-75, 348-59. The large bison populations and passenger pigeon populations seen by early explorers were likely the result of the recent decimation of Indians by European diseases. Many researchers also believe that large swaths of the Amazon rainforest are also the product of human action, created centuries ago as orchards.

<sup>72</sup> *Id.* at 287.

“they were exploring not a wilderness but a vast pasture managed by and for Native Americans.”<sup>73</sup>

While there is little debate that humans exert a large influence on the environment, there is debate as to how far back the notion of the Anthropocene extends.<sup>74</sup> Today, some archaeologists believe humans may be responsible for the extinction of large mammals across several continents during the late Pleistocene more than 10,000 years ago.<sup>75</sup> Anthropogenic forces may also have impacted the global climate for thousands of years. Carbon dioxide emissions increased significantly around 8,000 years ago as humans began clearing and burning large swaths of forests for agriculture, and methane emissions increased 5,000 years ago as humans began rice farming. William Ruddiman, a paleoclimatologist from the University of Virginia, estimates that these early anthropogenic impacts may have been large enough to prevent another ice age from occurring and, in effect, ensured the continued survival of humanity.<sup>76</sup>

Emma Marris describes the reach of human impact on ecosystems succinctly in her influential 2011 book, *Rambunctious Garden*: “Every ecosystem, from the deepest heart of the largest national park to the weeds growing behind the local big-box store, has been touched by humans.”<sup>77</sup> Marris argues that conservationists should reject the idea of pristine wilderness and adopt a “more nuanced notion of a global, half-wild rambunctious garden, tended by us.”<sup>78</sup> In 2012, a group of scientists led by Peter Kareiva, chief scientist for the Nature Conservancy, similarly criticized conservationists for viewing nature apart from people in a provocative essay, *Conservation in the Anthropocene*.<sup>79</sup> The scientists urged conservationists to embrace “a new vision of a planet in which nature—forests, wetlands, diverse species, and other ancient ecosystems—exists amid a wide variety of modern, human landscapes.”<sup>80</sup>

The Anthropocene idea is challenging entire sub-disciplines of the ecological science. In a 2012 essay, Kareiva and Michelle Marvier revisit Michael Soulé’s foundational 1985 article on conservation biology.<sup>81</sup> Referring to the emerging Anthropocene idea, the authors claim that “we live in a world dominated by humans, and therefore, the scientific underpin-

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<sup>73</sup> *Id.* (quoting DALE F. LOTT, *AMERICAN BISON: A NATURAL HISTORY* 88 (2002)).

<sup>74</sup> *See generally* William F. Ruddiman, *The Anthropocene*, 41 *ANN. REV. EARTH & PLANETARY SCI.* 45 (2013).

<sup>75</sup> *See generally* PAUL S. MARTIN, *TWILIGHT OF THE MAMMOTHS: ICE AGE EXTINCTIONS AND THE REWILDING OF AMERICA* (2007). *See also* MANN, *supra* note 3, at 155-96.

<sup>76</sup> *See generally* William F. Ruddiman, *The Anthropogenic Greenhouse Era Began Thousands of Years Ago*, 61 *CLIMATIC CHANGE* 261 (2003).

<sup>77</sup> MARRIS, *supra* note 4, at 5.

<sup>78</sup> *Id.* at 2.

<sup>79</sup> Kareiva et al., *Conservation in the Anthropocene*, *supra* note 4.

<sup>80</sup> *Id.* at 30.

<sup>81</sup> Kareiva & Marvier, *supra* note 2, at 962 (2012).

nings of conservation must include a consideration of the role of humans.”<sup>82</sup> Challenging the very foundation of conservation biology as “concerned solely with the welfare of nonhuman nature,” they propose a new framework of *conservation science* as “a discipline that requires the application of both natural and social sciences to the dynamics of coupled human–natural systems.”<sup>83</sup>

“In the traditional view of conservation,” Karieva and Marvier write, “people play one of two roles: The vast majority of people are a threat to biodiversity, and a relatively small number—mostly Western biologists—act as biodiversity’s protectors and, one hopes, saviors.”<sup>84</sup> This is problematic because “conservation is fundamentally an expression of human values.”<sup>85</sup> People’s actions and values shape and reshape the natural world, just as they have in Yosemite Valley. Karieva and Marvier’s conception of conservation science seeks “a more integrative approach in which the centrality of humans is recognized in the conservation agenda.”<sup>86</sup>

The recognition that “ecological dynamics cannot be separated from human dynamics,” as Karieva and Marvier suggest, harkens back to the critique of climax communities made by British ecologist A.G. Tansley.<sup>87</sup> In the 1930s, Tansley put forth the idea of an “anthropogenic” climax: “We cannot confine ourselves to the so-called ‘natural’ entities and ignore the processes and expressions of vegetation now so abundantly provided to us by the activities of man.”<sup>88</sup> Today, the idea of “novel ecosystems” is gaining wider acceptance in ecology.<sup>89</sup> Such ecosystems are the product of human influence, often resulting in new combinations of species—both native and nonnative—that form anything but pristine, climax ecosystems. Yet novel ecosystems now dominate much of the world’s surface, and although they were largely ignored by an earlier generation of ecologists, they are now a focus of ecological research.<sup>90</sup> Erle Ellis, an ecologist at the University of Maryland in Baltimore, has suggested the idea of “anthromes” or “human biomes” to better understand these anthropogenic landscapes and their dynamics at local and global scales.<sup>91</sup> In contrast to the conventional

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<sup>82</sup> *Id.*

<sup>83</sup> *Id.*

<sup>84</sup> *Id.* at 963 (citation omitted).

<sup>85</sup> *Id.*

<sup>86</sup> *Id.*

<sup>87</sup> Kareiva & Marvier, *supra* note 2, at 962.

<sup>88</sup> WORSTER, *supra* note 29, at 240.

<sup>89</sup> *E.g.*, MARRIS, *supra* note 4, at 111-22.

<sup>90</sup> RICHARD J. HOBBS ET AL., NOVEL ECOSYSTEMS: INTERVENING IN THE NEW ECOLOGICAL WORLD ORDER 4 (2013) (“Until recently, the types of [novel] ecosystem resulting from these trends have largely been ignored both in ecological theory and in practical management, and yet they now loom large as a growing part of the world in which we live.”).

<sup>91</sup> Erle C. Ellis & Navin Ramankutty, *Putting People in the Map: Anthropogenic Biomes of the World*, 6 FRONTIERS ECOLOGY & ENV’T 439, 445 (2008).

view among ecologists of a world comprised of natural biomes with occasional human disturbances, anthromes “tell a completely different story, one of ‘human systems, with natural ecosystems embedded within them.’”<sup>92</sup>

### C. *Dynamic Ecology, Static Policy*

Ecologists are discovering that the natural world is characterized by perpetual change and dramatic human influence, yet our standard approaches to environmental problems remain based on assumptions of equilibrium and pristine nature. Historic baselines form the foundation for most of today’s environmental statutes and regulations, which are often based on the goal of restoring the environment to an earlier set of desired conditions.<sup>93</sup> The Endangered Species Act, National Environmental Policy Act, and the Wilderness Act, as well as many of the statutes governing federal land management agencies such as the U.S. Forest Service, National Park Service, and Bureau of Land Management, are broadly based on the idea that an arbitrary baseline condition is the proper state to which the environment should be restored. Most of the large, centrally planned natural resource projects of the twentieth century were similarly based on the belief that environmental conditions at the time were relatively constant or that any dynamic forces inherent in nature could be effectively restrained or stabilized by planners.<sup>94</sup>

This tendency to address environmental problems from an equilibrium perspective has undermined our ability to integrate diverse human demands with an ever-changing environment. Consider the case of water allocation throughout much of the United States. Established in 1922, the Colorado River Compact allocates water from the Colorado River Basin to seven western states. The compact based water allocations on flow levels between the years 1899 to 1920. Years later, as researchers developed a better understanding of the hydrologic history of the basin, it became clear that the allocation decisions were based on a period of historically high river flows. Persistent droughts and changing human demands for water have

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<sup>92</sup> *Id.*

<sup>93</sup> J.B. Ruhl & James Salzman, *Gaming the Past: The Theory and Practice of Historic Baselines in the Administrative State*, 64 VANDERBILT L. REV. 1, 5 (2010).

<sup>94</sup> As Bosselman and Tarlock note,

Plans were not thought of as processes for adapting to change, but as visions of an ideal future that, once achieved, would avoid the need for additional change. Like the builders of suburban residential communities or the planners of national parks, scientists of the day tended to emphasize the objective of stability rather than the need for adaptability to ongoing change.

Fred P. Bosselman & A. Dan Tarlock, *The Influence of Ecological Science on American Law: An Introduction*, 69 CHI-KENT L. REV. 847, 860 (1994) (footnotes omitted).

significantly reduced flows, causing concerns that Upper Basin states will not be able to comply with the compact.<sup>95</sup>

Studies of past environmental conditions in other regions reveal similar challenges. A reconstruction of the region's drought history from 1665 to 2010 suggests that the recent water shortages in Georgia, Florida, and Alabama are not unprecedented.<sup>96</sup> Severe droughts of even longer duration occurred more often between 1696 and 1820, and they are likely to occur in the future.<sup>97</sup> The drought record indicates that the region's state and local water allocation decisions were made during one of the wettest periods since 1665.<sup>98</sup> With continued growth in the region, along with an allocation system based on a static view of nature, the South's "water wars" are likely to intensify. Likewise, reconstructions of California's drought history reveal frequent "mega-droughts" throughout history that were more severe and longer lasting than droughts experienced by modern society.<sup>99</sup>

Reconciling the dynamic forces of nature with environmental policies based on equilibrium has proven difficult in other areas. Ecologists now recognize the important role that fire, both natural and man-made, has played in shaping many landscapes. By the twentieth century, however, a national policy of forest fire suppression imposed a static view of nature onto forest management. Fire suppression, along with other policies limiting timber harvests on national forests, caused significant increases in forest growth and density. In some areas of the southwestern United States, forest density has increased from less than 100 trees per acre to more than 1,000 trees per acre.<sup>100</sup> Today, this increase in forest density fuels larger and more damaging wildfires. Craig Allen, a research ecologist with the United States Geological Survey, estimates that today's megafires, which reach the trees' canopies rather than remaining on the ground, may threaten the very future of the forests.<sup>101</sup> Indeed, forests in some regions have not been regenerating after being scorched by massive fires fueled by decades of fire suppression.<sup>102</sup>

The Endangered Species Act (the Act), in particular, reflects an unrealistic and outdated view of nature that is both static and overly simplis-

<sup>95</sup> See Ruhl & Salzman, *supra* note 93, at 26-27.

<sup>96</sup> Pederson et al., *A Long-Term Perspective on a Modern Drought in the American Southeast*, 7 ENVTL. RES. LETTERS 1, 5-6 (2012).

<sup>97</sup> *Id.*

<sup>98</sup> *Id.*

<sup>99</sup> Edward R. Cook, Richard Seager, Mark A. Cane & David W. Stahle, *North American Drought: Reconstructions, Causes, and Consequences*, 81 EARTH-SCIENCE REVS. 93, 93 (2007); Glen M. MacDonald, *Severe and Sustained Drought in Southern California and the West: Present Conditions and Insights from the Past on Causes and Impacts*, 173-74 QUATERNARY INT'L 87, 87 (2007).

<sup>100</sup> *Hearing Before the S. Comm. on Energy and Natural Resources*, 112th Cong. 5 (2012) (statement of Dr. Craig D. Allen, U.S. Geological Survey, Dep't of Interior).

<sup>101</sup> *Id.*

<sup>102</sup> *Id.*

tic.<sup>103</sup> These static assumptions, when translated into law, have often complicated federal conservation efforts.<sup>104</sup> In its current form, the Act has experienced several problems squaring the reality of a complex and dynamic world with the static and orderly world envisioned in the Act. For one, the Act assumes that the boundaries between species are fixed and definable, yet there is no widely accepted definition among scientists of what species are and how they should be identified.<sup>105</sup> Translating the concept of species taxonomy into effective law has been difficult. The Act provides a broad definition of “species,” but the definition has proven to be unclear or impractical in practice in many cases.<sup>106</sup> The Act has proven to be problematic in practice and resulted in considerable controversy because it is predicated on the notion of a static definable species, and attaches such significant regulatory and economic consequences to that underlying concept.

The distinction between species might seem clear enough in most cases, but when it comes to implementing the Act in practice, different interpretations of the species concept can have profound effects. As just one example, under some strict interpretations, polar bears may not be a distinct species from brown bears.<sup>107</sup> There is genetic evidence that some brown bears may be more closely related to polar bears than they are to other brown bears.<sup>108</sup> Such an interpretation would clearly have significant impacts on whether or not regulatory protections for polar bears are warranted. Moreover, the notion of a “subspecies” is even more fraught with disagreement.<sup>109</sup> There is debate among scientists over whether the Preble’s meadow jumping mouse, a small rodent widely considered an endangered species, is a distinct subspecies from the common meadow jumping mouse.<sup>110</sup> Hybridization among species poses yet another problem for the Act. In some cases, hybrid species may not be considered “true” species and could outbreed other “pure” species.<sup>111</sup> However, in other cases, hybrids could also serve an important evolutionary role in preserving threatened species. In recent decades, the emergence of “coy wolves” (coyote–wolf hybrids) and “pizzly bears” (polar bear–grizzly hybrids) have posed interesting problems for enforcement of the Act, and for conservationists in general.<sup>112</sup>

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<sup>103</sup> Holly Doremus, *The Endangered Species Act: Static Law Meets Dynamic World*, 32 WASH. U. J.L. & POL’Y 175 (2010).

<sup>104</sup> *Id.* at 215.

<sup>105</sup> *Id.* at 184–88.

<sup>106</sup> 16 U.S.C. § 1532(16) (2006).

<sup>107</sup> Emma Marris, *The Species and the Specious*, 446 NATURE 250, 250–51 (2007).

<sup>108</sup> *Id.* at 250.

<sup>109</sup> Doremus, *supra* note 103, at 186–88.

<sup>110</sup> Marris, *supra* note 107, at 251.

<sup>111</sup> Doremus, *supra* note 103, at 188–89.

<sup>112</sup> Moises Velasquez-Manoff, *Should You Fear the Pizzly Bear?*, N.Y. TIMES MAGAZINE, Aug. 14, 2014, at 1.

The controversy over the northern spotted owl in the Pacific Northwest presents another example of the trouble with reconciling dynamic nature with static law. After the owl was listed as threatened under the Act in 1990, timber harvesting in Washington and Oregon came to a standstill in an effort to protect old-growth forests, the owl's preferred habitat. But more than two decades of federal protection have done little to help the spotted owl.<sup>113</sup> Its numbers continue to decline due to habitat encroachment by the barred owl, a slightly larger and more aggressive species.<sup>114</sup> Common in the eastern United States, barred owls are now displacing and interbreeding with spotted owls in the West. Over the last century, barred owls have gradually expanded from east to west, reaching Montana in 1909, Washington in 1965, and Oregon in 1972.<sup>115</sup> Within the context of the Act, the barred owl is considered nonnative to western forests. The federal government has responded to these changes with plans to shoot barred owls in order to protect the less aggressive spotted owls.<sup>116</sup> The plan is not without critics. Some biologists believe the owls were once the same species, split into eastern and western varieties during the last ice age. The natural expansion of the barred owl blurs the line between native and nonnative species. Moreover, such population movements are not unusual in a dynamic natural world. A recent study found that 111 North American bird species recently expanded their ranges into other states, calling into question the static view of the natural world that underlies endangered species policy.<sup>117</sup> In 2011, the U.S. Fish and Wildlife Service issued its final spotted owl recovery plan, which calls for \$127 million and another thirty years of management.<sup>118</sup>

Daniel Botkin summed up the extent to which equilibrium views are entrenched in the way ecologists think about environmental policy in this way: "If you ask an ecologist if nature never changes, he will almost always say no. But if you ask that same ecologist to design a policy, it is almost always a balance of nature policy."<sup>119</sup> Botkin goes on to say:

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<sup>113</sup> Eric Mortenson, *Make This Call in the Wild: Should Oregon Shoot Barred Owls to Save Spotted Owls?*, OREGONIAN, Feb. 5, 2011, at 3.

<sup>114</sup> *Id.* at 1.

<sup>115</sup> *Id.* at 3.

<sup>116</sup> *Id.* at 1.

<sup>117</sup> See generally Kent B. Livezey, *Killing Barred Owls to Help Spotted Owls II: Implications for Many Other Range-Expanding Species*, 91 NORTHWESTERN NATURALIST 251 (2010).

<sup>118</sup> U.S. FISH & WILDLIFE SERV., REVISED RECOVERY PLAN FOR THE NORTHERN SPOTTED OWL (*STRIX OCCIDENTALIS CAURINA*) (2011), available at <http://www.fws.gov/oregonfwo/Species/Data/NorthernSpottedOwl/Recovery/Library/Documents/RevisedNSORecPlan2011.pdf>.

<sup>119</sup> MARRIS, *supra* note 4, at 30.

Whatever the scientist's knowledge of the dynamic, changing properties of nature, the formal representations of these remove such considerations in most cases. . . . [W]hether or not environmental scientists know about geological time and evolutionary biology, their policies ignore them.

It is strange, ironic and contradictory.<sup>120</sup>

Indeed, equilibrium policies, such as historic baseline management, are only feasible on a large scale if ecosystems remain relatively constant. While park managers in Yosemite may be able to restore some semblance of Yosemite Valley as it existed at the time of Carleton Watkins' Kodachrome still-life of El Capitan, water managers and wildlife officials are forced to deal with the reality of nature as a moving picture show.

## II. DYNAMIC ECONOMICS

Economists have traditionally viewed markets the way we might view a still-life image of Yosemite Valley. Standard assumptions of perfect information, perfect competition, and zero transaction costs cause economists to focus their attention on hypothetical points of equilibrium in which the forces of supply and demand are in balance. As economists from the so-called Austrian school of economics have argued, this tendency to view markets as if they exist in equilibrium distracts economists from the market processes, entrepreneurial activities, and institutions that guide markets toward their prevailing conditions.<sup>121</sup> The extent of economists' fixation with equilibrium conditions, and the folly of the assumptions on which their models are based, is perhaps best demonstrated by one economist who went so far as to outline the equilibrium conditions in which society would achieve its "bliss point."<sup>122</sup>

But just as nature is never in equilibrium, neither are markets. Although equilibrium concepts are useful for developing hypotheses and gaining insights into basic market responses, they obscure the moving picture show of the market process. This dynamic process, found in both ecosystems and markets, suggests an important connection between ecology and economics. It is this connection that I am calling Austrian ecology.

Although markets may have a tendency toward order and even equilibrium, any equilibrium is a moving target and therefore is never reached. The features of this equilibrating process, however, are important for understanding how certain market outcomes are achieved. Much like the interac-

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<sup>120</sup> BOTKIN, *THE MOON*, *supra* note 43, at xiii-xiv.

<sup>121</sup> See generally PETER J. BOETTKE, *HANDBOOK ON CONTEMPORARY AUSTRIAN ECONOMICS* (2010).

<sup>122</sup> See generally Francis Bator, *The Simple Analytics of Welfare Maximization*, 47 *AM. ECON. REV.* 22 (1957).

tion of organisms in nature, the Austrian view of the market process emphasizes the interaction of individuals based on factors that are time- and place-specific.<sup>123</sup> Just as individual species fill niches in ecosystems, entrepreneurship and specialization fill niches in markets that are constantly evolving in a Darwinian sense. Successful entrepreneurship depends on the entrepreneur using local knowledge and resources more efficiently than other individuals. As a result, inefficient resource use in markets and in ecosystems is crowded out through the process of entrepreneurship and evolution.

The critique that Austrian economists level against mainstream economics focuses on the inability of formal economic analysis to understand real-world market phenomena. In particular, Austrians criticize the equilibrium assumptions that underlie formal economic analysis as distracting economists from understanding the dynamics of the market process.<sup>124</sup> To Hayek, the central economic problem is one of coordination between individual human actors with dispersed knowledge.<sup>125</sup> Hayek sought to understand “how the spontaneous interaction of a number of people, each possessing only bits of knowledge, brings about a state of affairs . . . which could be brought about by deliberate direction only by somebody who possessed the combined knowledge of all those individuals.”<sup>126</sup> Hayek later described this as the “problem of the utilization of knowledge which is not given to anyone in its totality.”<sup>127</sup> To Austrian economists such as Hayek, it is only through a competitive market process that the relevant local and time-specific knowledge can be communicated in any intelligible and meaningful way.

At its core, this competitive market process depends on entrepreneurial discovery guided by prices. Hayek’s critique of standard economics was that its focus on equilibrium conditions forced economists to assume that all market actors had complete knowledge. Economists had largely ignored the process by which the relevant “knowledge of the particular circumstances of time and place” were conveyed through the price system.<sup>128</sup> Moreover, they ignored the role of the entrepreneur in responding to changing market conditions. Acting on the disequilibrium inherent in the market process, entrepreneurs continually discover and convey new knowledge that

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<sup>123</sup> F. A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519, 522 (1945).

<sup>124</sup> See ISRAEL KIRZNER, COMPETITION AND ENTREPRENEURSHIP 1 (1973) (Kirzner’s theory of the market is motivated by “a dissatisfaction with the usual emphasis on *equilibrium analysis*, and in an attempt to replace this emphasis by a fuller understanding of the operation of the market as a *process*”).

<sup>125</sup> Hayek, *supra* note 123.

<sup>126</sup> F.A. Hayek, *Economics and Knowledge*, in INDIVIDUALISM AND ECONOMIC ORDER 33, 50-51 (1937).

<sup>127</sup> Hayek, *supra* note 123, at 520.

<sup>128</sup> Hayek, *supra* note 123, at 521.

is not reflective in market prices, promoting an ever-changing, occasionally discordant market process.<sup>129</sup>

This dynamism of the market process resists the sort of formal equilibrium analysis common in mainstream economics. As James Buchanan argued, theoretical economic models of perfectly competitive general equilibrium produce little more than “intellectual muddle.”<sup>130</sup> “By imposing the condition that no participant in the economic process can independently influence the outcome of this process, all ‘social’ content is squeezed out of individual behavior in market organization.”<sup>131</sup> In such models, “[t]he individual responds to a set of externally-determined, exogenous variables, and his choice problem again becomes purely mechanical,” reducing “individual choice behavior from a social-institutional context to a physical-computational one.”<sup>132</sup>

Buchanan’s critique is not unlike Daniel Botkin’s argument against equilibrium ecological models, which reduce the biological world to a simple, mechanistic system. Lotka-Volterra models in ecology assume, for instance, that moose and wolf interactions are purely mechanical, each species being equally identical in every way. “A wolf pack would not be divided into lead male and female; there would be no wolf pups playing at the adults’ heels,” writes Botkin.<sup>133</sup> “The populations are viewed as though from afar, through the wrong end of a telescope, reduced to their simplest single character, each animal indistinguishable from others of the same species.”<sup>134</sup> Like the standard economic models described by Buchanan, the traditional ecological analysis of moose and wolf dynamics is merely a computational one.

In Buchanan’s view, mainstream economists mistakenly characterize the economic problem as one of resource allocation.<sup>135</sup> Given the realities of scarcity, mainstream economists often frame their study as one concerned with the efficient allocation of scarce resources among competing ends. Along with other Austrian economists, Buchanan rejects this “theory of resource allocation” in favor of a more dynamic “theory of markets” that focuses on the process of exchange.<sup>136</sup> If the economic problem is simply one of resource allocation, then it is ultimately a problem best addressed by applied mathematicians using relatively simple computations to find the right allocation given certain market conditions. “If the utility function of the choosing agent is fully defined in advance, choice becomes purely me-

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<sup>129</sup> See KIRZNER, *supra* note 124.

<sup>130</sup> James M. Buchanan, *What Should Economists Do?*, 30 S. ECON. J. 213, 218 (1964).

<sup>131</sup> *Id.*

<sup>132</sup> *Id.*

<sup>133</sup> BOTKIN, *THE MOON*, *supra* note 43, at 56.

<sup>134</sup> *Id.*

<sup>135</sup> Buchanan, *supra* note 130.

<sup>136</sup> *Id.* at 214.

chanical,” Buchanan argues.<sup>137</sup> “No ‘decision,’ as such, is required; there is no weighing of alternatives.”<sup>138</sup> Like the moose and wolves in Botkin’s example, the real-world dynamism of the market process is overlooked in the equilibrium analysis.<sup>139</sup>

With its focus on resource allocation and its preoccupation with equilibrium models, standard economics is susceptible to the same teleological tendencies that Botkin describes in ecology. The Austrian framework, with its focus on market processes rather than end states, seeks to avoid such tendencies. Buchanan argues forcefully on this point:

In economics . . . the “efficiency” that such market arrangements produce is independently conceptualized. Market arrangements then become “means,” which may or may not be relatively best. Until and unless this teleological element is fully exorcised from basic economic theory, economists are likely to remain confused and their discourse confusing.<sup>140</sup>

In his earlier work, Buchanan argued a related point. “The ‘market’ or market organization is not a *means* toward the accomplishment of anything. It is, instead, the institutional embodiment of the voluntary exchange processes that are entered into by individuals in their several capacities. This is all that there is to it.”<sup>141</sup>

Much like Gleason’s individualistic view of nature, Austrian economists insist that individual human action should be the focal point of economic analysis. As Peter Boettke explains, Austrians emphasize that only individuals choose and, therefore, the individual human actor should be the starting point for understanding the market process. “Man, with his purposes and plans, is the beginning of all economic analysis. Only individuals make choices; collective entities do not choose.”<sup>142</sup> When economists focus on collective units or statistical aggregates instead of individuals, they adopt what might be considered a Clementsian view of economics, not unlike Frederic Clements’ view of nature as a “superorganism.”

Nonetheless, despite the critiques of the Austrian school, equilibrium models are still pervasive in formal economic analysis.<sup>143</sup> And just as ecologists considered Clements’ idealized “climax” communities as the “yard-

<sup>137</sup> *Id.* at 217.

<sup>138</sup> *Id.*

<sup>139</sup> Buchanan goes so far as to suggest the terms “catallactics” or “symbiotics” in place of “economics.” He prefers symbiotics, which he defines as “the study of the association between dissimilar organisms, and the connotation of the term is that the association is mutually beneficial to all parties.” *Id.* at 35; see also BOTKIN, *THE MOON*, *supra* note 43, at 56.

<sup>140</sup> James M. Buchanan, *Order Defined in the Process of Its Emergence*, LITERATURE OF LIBERTY, Winter 1982, at 5, 5.

<sup>141</sup> Buchanan, *supra* note 130, at 219.

<sup>142</sup> BOETTKE, *supra* note 121, at xii.

<sup>143</sup> See generally Peter J. Boettke & Kyle W. O’Donnell, *The Failed Appropriation of F.A. Hayek by Formalist Economics*, 25 CRITICAL REV. 305 (2013).

stick by which man's intrusions into nature could be measured,"<sup>144</sup> economists use equilibrium analysis as the yardstick by which to measure market failure. That is, markets are said to fail when they do not satisfy the assumptions and conditions of a perfectly balanced, competitive equilibrium. When certain blackboard assumptions fail to hold—when there are informational asymmetries, incomplete markets, external costs, or other unfortunate everyday realities of human existence—the outcome of the market process is considered second-best to some “ideal” outcome that properly accounts for the market's failures. These are often considered as justification for government actions such as taxes, subsidies, or regulations to adjust the market imperfections into a perfect equilibrium.

This preoccupation with formal equilibrium theory has led economists to neglect the importance of institutions in economic analysis. Instead of using equilibrium analysis as a benchmark for evaluating market outcomes, Hayek argues for comparative institutional analysis based on the real-world constraints of human interaction. Because knowledge in society is dispersed and “not given to anyone in totality,” economists should focus attention on how different institutions solve the coordination problem identified by Hayek.<sup>145</sup> In the context of Austrian ecology, this analysis should consider how various institutions integrate the dynamic ecological process with the dynamic market process.

### III. RECONCILING DYNAMIC ECOLOGY AND ECONOMICS

Understood as dynamic processes rather than static systems, markets and ecosystems have important similarities that are relevant for how we think about the interface between humans and nature. As we have seen, both are characterized by dynamic processes of constant change. The diverse interactions of organisms in nature and people in markets promote a spontaneous order that emerges through constant adaptation and continues to evolve. Ecosystem and market processes rely on local- and time-specific factors to adapt to changing circumstances. What is more, human action and human values exert a significant influence on natural systems. For millennia, human demands on nature's bounty have continually shaped and reshaped landscapes and contributed to the shifting mosaic of the natural world.

Once we accept that nature is profoundly shaped by and connected to human action, we begin to consider environmental problems through a different lens. In this view, environmental problems cannot be thought of as simply the consequence of human violations of the balance of nature. A new generation of ecologists has rejected the idea of a natural harmony in

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<sup>144</sup> WORSTER, *supra* note 29, at 234.

<sup>145</sup> Hayek, *supra* note 123, at 520.

ecosystems undisturbed by people.<sup>146</sup> Moreover, environmental problems cannot be solved by simply separating natural systems from human influence. As the notion of the Anthropocene suggests, virtually all of earth's landscapes have been impacted in one way or another by human action.

Instead, environmental problems become questions of how to resolve competing human demands on an ever-changing natural world. Farmers in the American West want to use stream water for their crops, while anglers and rafters want to leave water in the stream for fish habitat and recreation. The Masai herders in Africa want to use the landscape to graze cattle as they have for centuries, while environmentalists and safari guides want to use it for wildlife habitat. Thought of in this way, the central problem then becomes a question of which institutions best allow humans to resolve those diverse and ever-changing human demands on an equally dynamic environment.

Contrary to the traditional equilibrium perspectives on economics and ecology, Austrian ecology suggests a more dynamic view of human's relationship with nature. Simply put, protecting the environment is not as simple as preventing human violations of nature's balance. It involves making tradeoffs—do we want scenic viewpoints or dense forests in Yosemite?—and doing so in a way that recognizes that nature is as ever-changing as the demands that humans place on it. How those tradeoffs are made in a world of diverse and conflicting human values ought to be the central environmental question of Austrian ecology.

## CONCLUSION

Keynes wrote that “[t]he ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else.”<sup>147</sup> But perhaps he should have included ecologists as well. In much the same way, the ideas of ecologists, both right and wrong, are more powerful than is often appreciated. The idea of the balance of nature undisturbed by humans has persisted throughout the development of ecology and played an important motivating role in the creation of the conservation and environmental movements. It is also the view that underlies almost every modern environmental policy.

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<sup>146</sup> Michael Shellenberger & Ted Norhaus, *Evolve*, ORION MAGAZINE, September–October 2011 (“Where ecotheology imagines that our ecological problems are the consequence of human violations of a separate ‘nature,’ modernization theology views environmental problems as an inevitable part of life on Earth. Where the last generation of ecologists saw a natural harmony in Creation, the new ecologists see constant change.”).

<sup>147</sup> WORSTER, *supra* note 29, at 294 (quoting JOHN MAYNARD KEYNES, GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY 383 (1936)).

This paper has attempted to trace out an alternate vision, an Austrian ecology that links together the Austrian theory of the market process with a more dynamic view of ecological processes. In contrast to deeply held beliefs about the balance of nature, this dynamic view relies on two emerging critiques within the field of ecology. First, the traditional assumption of a steady-state balance of nature undisturbed by humans is unsupported by the evidence. Second, nature cannot be easily separated, if at all, from human action. The first idea is found in the work of a new generation of ecological theorists, most notably Daniel Botkin, and the second idea is embodied in the current proposal of the “Anthropocene” as the new geologic era to replace the Holocene. Although both ideas are still hotly debated in ecological circles, they are increasingly gaining acceptance.

This critique within ecology is then connected to the critique put forth by Hayek and other economists of the Austrian school. In particular, these Austrian theorists focused on the dynamic forces within the market process. As I have shown, a new generation of ecologists are critically reexamining the assumptions that underlie their theories and, unknowingly, mounting a remarkably similar critique to the one made by Austrian economists.

By integrating the two theories, I consider what this Austrian ecology vision implies for how humans interface with the environment. If there is no balance of nature and ecological dynamics cannot be separated from human dynamics, then environmental problems can no longer be viewed as simply violations of nature’s balance. Nor can they be solved by separating humans from nature. Rather, environmental problems involve making tradeoffs between the competing and evolving values that humans place on their ever-changing environment. Thus, the central environmental question should be how human institutions resolve conflicting human demands on a dynamic natural world.

## BITCOINS VS. STATE MONEY TRANSMISSION LAWS: PROTECTING CONSUMERS OR HINDERING INNOVATION?

*Jacob Hamburger\**

### INTRODUCTION

In May 2013, the federal government seized more than \$5 million from several accounts associated with the Bitcoin currency exchange, Mt. Gox.<sup>1</sup> According to the warrants, the funds were seized because neither Mt. Gox nor its subsidiary registered as a money transmitter with the Treasury Department's Financial Crimes Enforcement Network (FinCEN).<sup>2</sup> Apparently when Mt. Gox was in the process of opening its bank accounts, it answered a few questions on its application incorrectly and neglected to then register with FinCEN.<sup>3</sup>

Nevertheless, the consequences for mistakes like Mt. Gox's are real: failing to register with FinCEN may result in a civil penalty of \$5,000 per violation, with each day counting as a separate violation.<sup>4</sup> On top of that, operating as an unlicensed money transmitter without the required state license is a federal criminal offense, punishable by a fine and imprisonment of up to five years.<sup>5</sup>

While the money transmitter law requiring businesses to register with FinCEN is relatively easy to comply with—the actual registration process consists of filling out a few forms online<sup>6</sup>—each state also has its own set of mandatory money transmission laws. Deciphering each state's individual laws can be very confusing, time-intensive, and expensive, especially for a small start-up business in a fledgling industry. In order to facilitate growth, competition, and innovation among payments services—including businesses that use Bitcoins—Congress should act to preempt the state money

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<sup>1</sup> Greg Schvey, *Additional \$2.1M Seized from Mt. Gox Accounts—Now Over \$5M Total*, TRADEBLOCK (Aug. 22, 2013), <https://tradeblock.com/blog/warrant-for-mt-gox-wells-fargo-accounts-shows-additional-2-1m-seized>.

<sup>2</sup> Aff. in Supp. of Seizure Warrant at 2-3, *In re the Contents of One Wells Fargo Bank Account*, and Up to \$50,000 in Another Wells Fargo Bank Account, No. 13-MJ-1085(SAG) (May 28, 2013) [hereinafter *Wells Fargo Aff.*]; Aff. in Supp. of Seizure Warrant at 2, *In re the Contents of One Dwolla Account*, No. 13-MJ-1163(SKG) (May 14, 2013) [hereinafter *Dwolla Aff.*].

<sup>3</sup> *Wells Fargo Aff.*, *supra* note 2; *Dwolla Aff.*, *supra* note 2.

<sup>4</sup> 31 U.S.C. § 5330(e) (2012).

<sup>5</sup> 18 U.S.C. § 1960 (2012).

<sup>6</sup> BSA E-FILING SYSTEM, <http://bsae filing.fincen.treas.gov/main.html> (last visited Apr. 25, 2015).

transmission regulations. In particular, this article recommends that Congress adopt a regime of “home state” regulation,<sup>7</sup> similar to the system currently used by credit cards and banks to export their home state’s usury laws to customers in different states.<sup>8</sup>

Part I of this article outlines the history of Bitcoins and describe the kinds of businesses that use Bitcoins. Part II discusses the money transmission laws, including how other money transmitters facing similar situations have been regulated and some of the state-level money transmission laws. Finally, Part III argues that the states have been regulating money transmitters incorrectly and that Congress should encourage growth and innovation in the industry by preempting the state laws.

## I. BACKGROUND—BITCOINS

This article advocates for reforming the money transmission laws to accommodate growth in the payments services industry generally. While Bitcoins are used in this article as a case study, the state money transmission laws act as a barrier for many different payments services both big and small, including those that transact in U.S. dollars and other currencies.<sup>9</sup>

Before analyzing how money transmission laws should be changed to accommodate growth in the virtual currency industry, and the payments services industry generally, it is crucial to understand exactly how the technology underlying Bitcoin works. It is also important to understand the federal and state money transmission laws and how they apply to Bitcoins.

### A. *What are Bitcoins?*

Part of what makes the regulation of Bitcoin so difficult is that the concept and mechanics of the Bitcoin system are very complicated. That is, a misunderstanding of Bitcoins can lead to regulations that are unclear and

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<sup>7</sup> See discussion *infra* Part II.B.1.

<sup>8</sup> Leslie McFadden, *Credit Cards Trump State Usury Law*, BANKRATE, <http://www.bankrate.com/finance/credit-cards/credit-cards-trump-state-usury-law.aspx> (last visited Apr. 25, 2015).

<sup>9</sup> For example, technology start-ups Dwolla and Square are both payments services companies that allow their customers to transmit U.S. dollars. Complaint at 18, *Think Computer Corp. v. Dwolla, Inc.*, No. 5:13-cv-02054, (N.D. Cal. May 6, 2013). However, both companies were subject to litigation for allegedly failing to obtain California money transmission licenses. Complaint at 4, *Think Computer Corp. v. Dwolla, Inc.*, No. 5:13-cv-02054, (N.D. Cal. May 6, 2013).

Even Western Union, considered a “traditional” money transmission business, no longer expects growth in its 2014 operating profit due “to increasingly strict legal and regulatory requirements.” Press Release, Western Union, Western Union Reports Third Quarter Results 3 (Oct. 29, 2013), *available at* [http://ir.westernunion.com/files/doc\\_news/Western%20Union%20Q3%20Earnings%20Release%20102913\\_v001\\_v83b13.pdf](http://ir.westernunion.com/files/doc_news/Western%20Union%20Q3%20Earnings%20Release%20102913_v001_v83b13.pdf).

riddled with problems.<sup>10</sup> Descriptions of Bitcoin have been covered extensively in prior journal articles and in the news, so extensive coverage of the topic is beyond the scope of this article.<sup>11</sup> However, it is important to at least have a general understanding of the currency and how it works.

Bitcoin<sup>12</sup> is a decentralized virtual currency<sup>13</sup> that allows its users to make irreversible instantaneous transactions anywhere around the world using the Internet.<sup>14</sup> Its decentralized nature means that unlike how the Federal Reserve regulates U.S. dollars, there is no central government or authority regulating Bitcoin's production and value.<sup>15</sup> Instead, the Bitcoin network relies on peer-to-peer technology to collectively verify transactions and issue more Bitcoins.<sup>16</sup> Bitcoin is not backed by any hard asset and its value relies on its users' confidence in the system.<sup>17</sup>

There are a few ways to obtain Bitcoins: users can exchange goods or services for them, buy them from online exchanges, find someone locally who is willing to sell them, or "mine" them from the network.<sup>18</sup> Mining, analogous to prospecting for precious minerals, is meant to incentivize users to contribute their computing power to verify network transactions by rewarding them with Bitcoins.<sup>19</sup>

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<sup>10</sup> See generally FIN. CRIMES ENFORCEMENT NETWORK, FIN-2013-G001, APPLICATION OF FINCEN'S REGULATIONS TO PERSONS ADMINISTERING, EXCHANGING OR USING VIRTUAL CURRENCIES (2013) (issuing interpretive guidance on the applicability of regulations to virtual currencies) [hereinafter FINCEN GUIDANCE].

<sup>11</sup> For a more in-depth look into Bitcoins see, for example, Reuben Grinberg, *Bitcoin: An Innovative Alternative Digital Currency*, 4 HASTINGS SCI. & TECH. L.J. 159, 160-68 (2012); see also Derek A. Dion, *I'll Gladly Trade You Two Bits on Tuesday for a Byte Today: Bitcoin, Regulating Fraud in the Economy of Hacker-Cash*, 2013 U. ILL. J.L. TECH. & POL'Y 165, 167-70 (2013); Joshua J. Doguet, *The Nature of the Form, Legal and Regulatory Issues Surrounding the Bitcoin Digital Currency System*, 73 LA. L. REV. 1119, 1125-31 (2013); Nikolei M. Kaplanov, *Nerdy Money: Bitcoin, the Private Digital Currency, and the Case Against Its Regulation*, 25 LOY. CONSUMER L. REV. 111, 114-29 (2012).

<sup>12</sup> For simplicity, this article capitalizes "Bitcoin" throughout. However, some individuals capitalize "Bitcoin" when referring to the currency, network, or community, but do not capitalize "bitcoin" when referring to a unit of the currency. *Introduction*, BITCOIN WIKI, [https://en.bitcoin.it/wiki/Introduction#Capitalization\\_2F\\_Nomenclature](https://en.bitcoin.it/wiki/Introduction#Capitalization_2F_Nomenclature) (last visited Apr. 25, 2015).

<sup>13</sup> Virtual currency is defined as "a medium of exchange that operates like a currency in some environments, but does not have all the attributes of real currency. In particular, virtual currency does not have legal tender status in any jurisdiction." FINCEN GUIDANCE, *supra* note 10, at 1. See BENJAMIN GEVA, *THE LAW OF ELECTRONIC FUNDS TRANSFERS* § 1.02 (20th ed. 2013) for a discussion on the genesis and early evolution of money from the barter system, to metallic money (coins), and then to paper money.

<sup>14</sup> BITCOIN WIKI, [https://en.bitcoin.it/wiki/Main\\_Page](https://en.bitcoin.it/wiki/Main_Page) (last visited Apr. 5, 2015).

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> *FAQ*, BITCOIN WIKI, <https://en.bitcoin.it/wiki/FAQ> (last visited Apr. 25, 2015).

<sup>18</sup> *Id.*

<sup>19</sup> See Doguet, *supra* note 11, at 1127-28.

While ordinary CPUs were once sufficient to mining, Bitcoin's popularity has created a separate industry for building highly specialized computers with the sole purpose of mining Bitcoins. See, e.g.,

The Bitcoin network is still relatively new and in its experimental stage.<sup>20</sup> While Bitcoin is becoming increasingly popular, it is still only accepted by a limited number of merchants.<sup>21</sup> Therefore, instead of viewing it as a replacement for traditional currencies, it is better to picture Bitcoin as a new payments system.<sup>22</sup>

The best way to understand the advantages of the Bitcoin network is to first understand the problems faced by prior money transmission systems. The traditional, trust-based model relies on third parties who are trusted by users to transmit the money, validate transactions, and mediate disputes.<sup>23</sup> Examples include companies like Western Union, Visa, and PayPal.<sup>24</sup> While this system works in most instances, transaction fees raise overall costs and make it inefficient to send very small payments, called “micro-payments.”<sup>25</sup>

Decentralized virtual currencies aim to solve the dilemmas of the trust-based system.<sup>26</sup> But without a trusted third party to validate transactions, it becomes difficult to prevent users from sending the same unit of money to different people.<sup>27</sup> Bitcoin attempts to solve this “double-spend” problem by using a digital public ledger known as the “blockchain.”<sup>28</sup> By time-stamping and recording each transaction in the blockchain, the receiver can be confident that the sender actually owns the Bitcoin and has not already spent it somewhere else.<sup>29</sup> Solving this double-spend problem is the primary innovation behind Bitcoin technology because now users no longer have to rely on a third party to verify transactions.<sup>30</sup>

Solving the double-spend problem has three primary benefits over previous money transmission systems: Bitcoin transactions are 1) secure, 2) efficient, and 3) free from third-party intermediaries.<sup>31</sup> Security is achieved through public-key cryptography.<sup>32</sup> This type of encryption involves the use of two mathematically linked “keys”: a public key, which is shared with

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BUTTERFLY LABS, <http://www.butterflylabs.com/> (last visited Apr. 25, 2015); KNCMINER, <http://www.kncminer.com/> (last visited Apr. 25, 2015).

<sup>20</sup> JERRY BRITO & ANDREA CASTILLO, BITCOIN: A PRIMER FOR POLICYMAKERS 10 (2013), available at [http://mercatus.org/sites/default/files/Brito\\_BitcoinPrimer.pdf](http://mercatus.org/sites/default/files/Brito_BitcoinPrimer.pdf).

<sup>21</sup> See *Places that Accept Bitcoins Directly*, SPENDBITCOINS, <https://www.spendbitcoins.com/places/> (last visited Apr. 25, 2013).

<sup>22</sup> BRITO & CASTILLO, *supra* note 20, at 10.

<sup>23</sup> *Id.* at 3-4.

<sup>24</sup> See *id.* at 3.

<sup>25</sup> See *id.* at 10.

<sup>26</sup> See SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM 1 (2008), available at <http://bitcoin.org/bitcoin.pdf>.

<sup>27</sup> See BRITO & CASTILLO, *supra* note 20, at 3-4.

<sup>28</sup> See *id.*

<sup>29</sup> See BRITO & CASTILLO, *supra* note 20, at 4-5.

<sup>30</sup> See BRITO & CASTILLO, *supra* note 20, at 3-4.

<sup>31</sup> Kaplanov, *supra* note 11, at 114-29.

<sup>32</sup> *Introduction*, BITCOIN WIKI, <https://en.bitcoin.it/wiki/Introduction> (last visited Apr. 25, 2015).

the world, and a private key, which acts like a password.<sup>33</sup> Public-key cryptography acts like an e-mail address. Anyone can send a message to the e-mail address, but only one person has access to the inbox.<sup>34</sup> Unlike e-mail addresses, which require a third party to store messages, Bitcoins get around this problem by recording each transaction in the publically available blockchain.<sup>35</sup>

For this reason, Bitcoins are also efficient. Without the need for a central third party to manage the network, Bitcoin transactions are cheaper and faster. Many Bitcoin transactions have very low to zero fees,<sup>36</sup> which makes it cost-effective for people to make micropayments and other similar innovations.<sup>37</sup> Since the Bitcoin network avoids using a third party, payments are completed in a matter of minutes.<sup>38</sup> In addition, because payments are impossible to reverse, sellers are also protected from fraudulent charge-backs, which are consumer-initiated payment reversals based on false claims of non-delivery.<sup>39</sup>

Bitcoins are stored in digital “wallets” identified by the wallet’s unique public key.<sup>40</sup> Wallets can be set up without being linked to any personally identifiable information, so Bitcoins can be sent or received discretely.<sup>41</sup> The relative privacy of Bitcoins has made it very popular among those who value their financial confidentiality.<sup>42</sup> However, this has also

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<sup>33</sup> BRITO & CASTILLO, *supra* note 20, at 5.

<sup>34</sup> Kaplanov, *supra* note 11, at 117.

<sup>35</sup> BRITO & CASTILLO, *supra* note 20, at 8.

<sup>36</sup> *Beginner’s FAQ*, BLOCKCHAIN <https://blockchain.info/wallet/bitcoin-faq> (last visited Apr. 25, 2015); *Transaction Fees*, BITCOIN WIKI, [https://en.bitcoin.it/wiki/Transaction\\_fees](https://en.bitcoin.it/wiki/Transaction_fees) (last visited Apr. 25, 2015). Other payment services charge substantially more. For example, PayPal charges sellers a fee of 2.9% + \$0.30 per transaction. *Fees*, PAYPAL, <https://www.paypal.com/webapps/mpp/paypal-fees> (last visited Apr. 25, 2015).

<sup>37</sup> BRITO & CASTILLO, *supra* note 20, at 10.

Some have argued that micropayments could save the newspaper industry and incentivize publishers to produce quality material. See Jonathan Stacke, *How Bitcoin Can Save Publishing*, TRADEBLOCK (Sept. 25, 2013), <https://tradeblock.com/blog/bitcoin-can-save-publishing>. The micropayments model allows online publishers to charge a fraction of a Bitcoin, or the equivalent of a few cents, per article. *Id.* Micropayments also discourage readers from subverting the paywall, since it is economically more costly to spend the time searching for a way around it. *Id.*

<sup>38</sup> *Average Transaction Confirmation Time*, BLOCKCHAIN, [https://blockchain.info/charts/avg-confirmation-time?timespan=1year&showDataPoints=false&daysAverageString=1&show\\_header=true&scale=0&address=](https://blockchain.info/charts/avg-confirmation-time?timespan=1year&showDataPoints=false&daysAverageString=1&show_header=true&scale=0&address=) (last visited Apr. 25, 2015). Though the average time for transactions to be “confirmed” by the network fluctuates, at the time this was written the average transaction time was approximately 6.0 minutes. *Id.* Compare this to transfers from PayPal to consumer bank accounts, which can take between three to four days. Question from *Help Center*, PAYPAL, [https://www.paypal.com/us/webapps/helpcenter/helpub/article/?solutionId=FAQ1189&topicID=ADD\\_WITHDRAW\\_MONEY&m=TCI](https://www.paypal.com/us/webapps/helpcenter/helpub/article/?solutionId=FAQ1189&topicID=ADD_WITHDRAW_MONEY&m=TCI) (last visited May 4, 2015).

<sup>39</sup> BRITO & CASTILLO, *supra* note 20, at 11-12.

<sup>40</sup> Dion, *supra* note 11, at 167-68.

<sup>41</sup> *Id.* at 168.

<sup>42</sup> See BRITO & CASTILLO, *supra* note 20, at 9.

made Bitcoins appealing to criminals, who can use them in exchange for illicit goods and to launder money.<sup>43</sup> This, of course, makes policymakers and law enforcement officials very nervous.<sup>44</sup>

While anyone can send or receive Bitcoins without giving away their personal information, it would be a misnomer to describe Bitcoins as fully anonymous.<sup>45</sup> For one, the public keys for each transaction are permanently recorded in the blockchain, along with the time, amount, and other information.<sup>46</sup> Every single transaction can be traced back from one user to the next by looking at the public ledger.<sup>47</sup> Though wallets or transactions are not themselves tied to individual identities, related online activity frequently leaves digital “breadcrumbs” that can be deciphered by the technologically savvy with relative ease.<sup>48</sup> Therefore, Bitcoins are not as anonymous as some may like to think, leading some scholars to refer to Bitcoins as “pseudonymous.”<sup>49</sup>

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<sup>43</sup> *Id.* at 20. An example of this was the Silk Road, an online marketplace where people were able to buy and sell a variety of illegal goods and services. Joseph Goldstein, *Arrest in U.S. Shuts Down a Black Market for Narcotics*, N.Y. TIMES, Oct. 3, 2013, at A3. Silk Road’s founder was arrested in October 2013 and the site was taken down, leading some to predict the demise of Bitcoin. Jon Xavier, *Why Bitcoin is Probably Doomed After Closure of Silk Road, the Internet’s No. 1 Drug Marketplace*, SILICON VALLEY BUS. J. (Oct. 3, 2013, 5:48 AM), <http://www.bizjournals.com/sanjose/news/2013/10/03/why-the-closure-of-the-internets.html>. However, others have argued that “Bitcoin’s value is not tied to Silk Road.” See Jerry Brito, *What Does the Silk Road Seizure Mean for Bitcoin?*, REASON.COM (Oct. 7, 2013), <http://reason.com/archives/2013/10/07/what-does-the-silk-road-seizure-mean-for>.

Money laundering is the process criminals use to disguise the source of money received from illegal activities. Catherine Martin Christopher, *Whack-A-Mole: Why Prosecuting Digital Currency Exchanges Won’t Stop Online Money Laundering*, 18 LEWIS & CLARK L. REV. 1, 3 (2014).

<sup>44</sup> Brett Wolf, *Senators Seek Crackdown on “Bitcoin” Currency*, REUTERS (June 8, 2013, 11:17 AM), <http://www.reuters.com/article/2011/06/08/us-financial-bitcoins-idUSTRE7573T320110608>. In this way, Bitcoins are lot like cash—it can be used for both good and bad. BRITO & CASTILLO, *supra* note 20, at 20.

<sup>45</sup> BRITO & CASTILLO, *supra* note 20, at 9.

<sup>46</sup> *Id.* at 8.

<sup>47</sup> *Id.*

<sup>48</sup> A variety of methods have been used to link Bitcoin-related activity to individual identities. For example, personal identities are often required to exchange Bitcoins to official currencies. *Id.* Some websites record IP addresses, allowing other to determine the user’s geographic location. *Id.* Investigators can also analyze transaction patterns to uncover identities. BRITO & CASTILLO, *supra* note 20 at 9.

While some have argued that real anonymity can be achieved through “mixing” services like Bitlaundry or Bitcoinlaundry, it is unclear how long these services will remain open before the government shuts them down. Nicole Perloth, *Unlike Liberty Reserve, Bitcoin Is Not Anonymous—Yet*, N.Y. TIMES (May 29, 2013, 12:07 AM), [http://bits.blogs.nytimes.com/2013/05/29/bitcoin-is-not-anonymous-but-it-could-be/?\\_r=0](http://bits.blogs.nytimes.com/2013/05/29/bitcoin-is-not-anonymous-but-it-could-be/?_r=0). Use of these services also requires users to trust that they will not themselves track or steal the money. *Id.* Finally, users who try to obscure the source of their Bitcoins must be sure to never transact with other users that could be tied back to their identity. BRITO & CASTILLO, *supra* note 20, at 8.

<sup>49</sup> BRITO & CASTILLO, *supra* note 20, at 2, 8, 20; Joshua Brustein, *Bitcoin May Not Be So Anonymous, After All*, BLOOMBERG BUSINESSWEEK (Aug. 27, 2013), <http://www.businessweek.com/articles/>

Nevertheless, money launderers are always looking for new ways to disguise the source and destination of their money, and Bitcoins can be used as a new tool for that purpose.<sup>50</sup> Many of the technological advantages Bitcoins offer for legitimate transactions can also be taken advantage of to launder money.<sup>51</sup> Therefore, many regulators have focused on Bitcoin's potential to facilitate laundering money.<sup>52</sup>

Aside from the level of privacy associated with Bitcoins, the currency is an attractive tool for laundering money because they can be sent across borders seamlessly via the Internet.<sup>53</sup> International transactions are also popular because they can confuse and hide their origins from authorities in each jurisdiction.<sup>54</sup> Emerging payment technologies, like Bitcoins, are also attractive to money launderers because they are less likely to be understood by government authorities.<sup>55</sup> Finally, the money used in illegal transactions can be quickly converted to and from Bitcoins quickly and cheaply through a handful of different online exchanges.<sup>56</sup>

#### B. *What Kind of Businesses Use Bitcoins?*

Bitcoins are already accepted by many different businesses, both big and small, around the world.<sup>57</sup> These businesses can be traditional brick-and-mortar shops or online marketplaces.<sup>58</sup> Several nonprofit organizations also accept donations using Bitcoins.<sup>59</sup> In addition to traditional businesses that provide goods or services, many investors have entered the Bitcoin marketplace.<sup>60</sup> To accommodate this rising popularity, other Bitcoin-related

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2013-08-27/bitcoin-may-not-be-so-anonymous-after-all; see also Elli Androulaki et al., *Evaluating User Privacy in Bitcoin*, in *Financial Cryptography and Data Security* 34, available at <http://eprint.iacr.org/2012/596.pdf> (showing that many Bitcoin users can be identified despite privacy measures).

<sup>50</sup> BRITO & CASTILLO, *supra* note 20, at 20.

<sup>51</sup> See Christopher, *supra* note 43, at 17.

<sup>52</sup> See FINCEN GUIDANCE, *supra* note 10, at 2 n.8.

<sup>53</sup> Christopher, *supra* note 43, at 8.

<sup>54</sup> *Id.*

<sup>55</sup> Robert Stokes, *Anti-Money Laundering Regulation and Emerging Payment Technologies*, 32 *BANKING & FIN. SERVICES POL'Y REP.* 1, 1 (2013); Christopher, *supra* note 43, at 8.

<sup>56</sup> See Christopher, *supra* note 43, at 17.

<sup>57</sup> Ariella Brown, *10 Companies That Use Bitcoins*, COINDESK (May 1, 2013, 9:00 AM), <http://www.coindesk.com/10-businesses-that-use-bitcoins>.

<sup>58</sup> *Trade*, BITCOIN WIKI, <https://en.bitcoin.it/wiki/Trade> (last visited Oct. 14, 2013).

<sup>59</sup> *Business and Organizations that "Also Accept Bitcoin", but Do Not Revolve Around Bitcoin*, BITCOIN WIKI, [https://en.bitcoin.it/wiki/Business\\_and\\_organizations\\_that\\_%22also\\_accept\\_Bitcoin%22\\_but\\_do\\_not\\_revolve\\_around\\_Bitcoin](https://en.bitcoin.it/wiki/Business_and_organizations_that_%22also_accept_Bitcoin%22_but_do_not_revolve_around_Bitcoin) (last visited Oct. 14, 2013).

<sup>60</sup> See, e.g., Dan Primack, *Fortress Is Forming a Bitcoin Fund*, CNNMONEY (Dec. 31, 2013, 12:14 PM), <http://finance.fortune.cnn.com/2013/12/31/fortress-is-forming-a-bitcoin-fund/>.

businesses offer online exchanges and products to facilitate Bitcoin-based commerce.<sup>61</sup>

Despite Bitcoin's murky regulatory standing, there are many different reasons why businesses would want to accept Bitcoins. First, Bitcoin payments are better at protecting customer privacy than traditional payment methods, like credit or debit cards.<sup>62</sup> Bitcoins also act as a global currency, allowing people anywhere in the world to buy or sell without having to worry about exchanging currencies or foreign regulations.<sup>63</sup>

However, businesses often accept Bitcoins for a more practical reason—transactions are cheaper and quicker to process.<sup>64</sup> While transaction fees, if any, for Bitcoins are very low, credit card companies often charge merchants fees of 2%–5%.<sup>65</sup> The lower fee structure makes micropayments feasible. In addition, there are no foreign transaction fees with Bitcoins and payments are often settled in a matter of minutes.<sup>66</sup> On the other hand, credit card transactions can take several days to process.<sup>67</sup>

Bitcoins also allow businesses to reach people across the globe who do not have access to traditional banking services. Since poor areas often have trouble developing traditional branch banking systems, people have turned to mobile payment systems to fill the void.<sup>68</sup> In areas where mobile phones are widely used, these “unbanked” populations use systems like M-Pesa to send money from one user to the next.<sup>69</sup> The use of Bitcoin can serve the same role by providing people in remote or developing areas with access to a global financial system used to both store money and make payments.<sup>70</sup>

## II. BACKGROUND—MONEY TRANSMITTERS

In response to the fear that Bitcoins may be used to illegally launder money and defraud consumers, many regulators have turned to the dual system of state and federal money transmission laws to fight back.<sup>71</sup> How-

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<sup>61</sup> Grinberg, *supra* note 11, at 160-68.

<sup>62</sup> Brown, *supra* note 57.

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> BRITO & CASTILLO, *supra* note 20, at 14.

<sup>69</sup> Erin F. Fonté, *Overview of Mobile Payments in the United States*, 32 NO. 8 BANKING & FIN. SERVICES POL'Y REP. 1, 8 (2013); M-Pesa is a closed-system mobile payment service popular in some developing countries. BRITO & CASTILLO, *supra* note 20, at 14.

<sup>70</sup> BRITO & CASTILLO, *supra* note 20, at 14.

<sup>71</sup> See Kevin V. Tu, *From Bike Messengers to App Stores: Regulating the New Cashless World*, 65 ALA. L. REV. 77, 85-86 (2013) (“State money transmitter laws . . . focus on consumer protection concerns. . . . In contrast, the Bank Secrecy Act (‘BSA’), which regulates money transmission at the federal level, exists primarily as an anti-money laundering statute.”) (footnotes omitted). On March 18,

ever, many of these laws are old and have lagged behind modern technological advances in payment services. As a result, many businesses and individuals that use virtual currencies, like Bitcoins, have been hesitant to proceed out of fear of being targeted by federal and state agency enforcement actions.

Although FinCEN recently released guidance on the applicability of the federal money transmission regulations to Bitcoins,<sup>72</sup> the guidance has still left many confused.<sup>73</sup> In addition, state regulatory agencies have offered little guidance on the applicability of their money transmission regulations to Bitcoins.<sup>74</sup> Nevertheless, in order to analyze the money transmission laws, it is important to first understand how the federal and state money transmission laws operate.

#### A. *What are the Federal Money Transmission Laws?*

The corpus of money transmission laws in the United States is made up of both federal- and state-level laws and their implementing regulations. While the federal and state laws have distinct requirements, they are intertwined. Specifically, federal law prohibits operating an unlicensed money transmission business under state law, regardless of whether the defendant knew of that state's licensing requirement.<sup>75</sup> For this reason, any potential money transmitter doing business in the United States must perform its due

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2013, FinCEN released interpretive guidance on the applicability of federal money transmission regulations to virtual currencies. See FINCEN GUIDANCE, *supra* note 10, at 1. Then on May 30, 2013, the California Department of Financial Institutions sent a cease and desist order to the Bitcoin Foundation. Letter from Paul T. Crayton, Senior Counsel, Cal. Dep't of Fin. Inst., to Bitcoin Found. (May 30, 2013), available at <http://www.scribd.com/doc/149335233/CA-State-Cease-and-Desist-May-30#page=1>. Also, on August 12, 2013, the New York Department of Financial Service issued subpoenas to several key entities in the Bitcoin industry. Kashmir Hill, *Every Important Person In Bitcoin Just Got Subpoenaed By New York's Financial Regulator*, FORBES (Aug. 12, 2013 1:43 PM), <http://www.forbes.com/sites/kashmirhill/2013/08/12/every-important-person-in-bitcoin-just-got-subpoenaed-by-new-yorks-financial-regulator/>.

<sup>72</sup> See generally FINCEN GUIDANCE, *supra* note 10 (clarifying the applicability of money transmitter regulations to virtual currencies). The guidance avoids referring to Bitcoins by name, instead referring to it generally as "de-centralized convertible virtual currency." FINCEN GUIDANCE, *supra* note 10, at 3, 5; Marco Santori, *Bitcoin Law: What US businesses need to know*, COINDESK (Aug. 17, 2013, 8:52 AM), <http://www.coindesk.com/bitcoin-law-what-us-businesses-need-to-know/> [hereinafter Santori, *What US Businesses Need to Know*].

<sup>73</sup> Santori, *What US Businesses Need to Know*, *supra* note 71 ("Struggling with this guidance, many bitcoin entrepreneurs have understandably felt like modern square pegs being jammed into round regulatory holes meant for ancient business models.").

<sup>74</sup> Marco Santori, *Bitcoin Law: Money Transmission on the State Level in the US*, COINDESK, (Sept. 28, 2013, 12:47 PM), <http://www.coindesk.com/bitcoin-law-money-transmission-state-level-us/> [hereinafter Santori, *Money Transmission on the State Level in the US*].

<sup>75</sup> 18 U.S.C. § 1960 (2012).

diligence and, at a minimum, understand the applicable laws at the state and federal level.

The federal Bank Secrecy Act (BSA), first enacted by Congress in 1970 as a result of the growing concerns over the use of foreign bank accounts to launder money,<sup>76</sup> is one of the main statutes used to combat money laundering.<sup>77</sup> Congress first granted the Secretary of the Treasury authority to enforce the BSA and its implementing regulations, and the Secretary has since delegated those powers to FinCEN, a bureau within the Treasury Department.<sup>78</sup>

The BSA and its implementing regulations act together to combat money laundering by, in part, requiring money services businesses (MSBs), which have traditionally been targets for money launderers,<sup>79</sup> to register with FinCEN and comply with specific reporting requirements and record-keeping policies.<sup>80</sup>

The regulations list several different types of MSBs, including money transmitters.<sup>81</sup> Money transmitters are defined broadly as:

[T]he acceptance of currency, funds, or other value that substitutes for currency from one person and the transmission of currency, funds, or other value that substitutes for currency to another location or person by any means [or] any other person engaged in the transfer of funds.<sup>82</sup>

For some time, many people were anxious about how Bitcoins, as a decentralized virtual currency, fit into the BSA regulations.<sup>83</sup> While other centralized virtual currencies have been the subject of enforcement actions in

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<sup>76</sup> JOHN K. VILLA, *BANKING CRIMES* § 6.1 (2013 ed.).

<sup>77</sup> See Christopher, *supra* note 43, at 1.

<sup>78</sup> VILLA, *supra* note 76, at § 6.2.

<sup>79</sup> FIN. CRIMES ENFORCEMENT NETWORK, *MONEY LAUNDERING PREVENTION: A MONEY SERVICES BUSINESS GUIDE 1*, available at [http://www.fincen.gov/statutes\\_regs/guidance/pdf/msb\\_prevention\\_guide.pdf](http://www.fincen.gov/statutes_regs/guidance/pdf/msb_prevention_guide.pdf) (“[M]oney services businesses . . . have been major targets in laundering operations because they provide a variety of services and instruments[] . . . used to conceal the source of illicit proceeds.”).

<sup>80</sup> 31 C.F.R. §§ 1010.1022 (2013).

<sup>81</sup> *Id.* The other types of MSBs are dealers in foreign exchanges, check cashers, issuers or sellers of traveler’s checks or money orders, providers of prepaid access, the U.S. Postal Service, and sellers of prepaid access. *Id.* § 1010.100(ff). Pursuant to its regulatory definition, dealers in foreign exchange must exchange the currency of two or more countries. *Id.* § 1010.100(ff)(1). Note that online Bitcoin exchanges are not considered dealers in foreign exchange because Bitcoins are not technically considered “currency” under the BSA, since it is not legal tender. FINCEN GUIDANCE, *supra* note 10, at 5-6.

<sup>82</sup> 31 C.F.R. § 1010.100(ff)(5)(i).

<sup>83</sup> Timothy B. Lee, *New Money Laundering Guidelines Are A Positive Sign For Bitcoin*, FORBES (Mar. 19, 2013 4:42 PM), <http://www.forbes.com/sites/timothylee/2013/03/19/new-money-laundering-guidelines-are-a-positive-sign-for-bitcoin/> (noting that “[b]itcoin is sufficiently different than anything that’s come before that there’s some genuine ambiguity about how US financial regulations apply to it”).

the past,<sup>84</sup> decentralized virtual currencies are sufficiently different to introduce ambiguity to how the regulations apply.<sup>85</sup>

In response to this growing concern over Bitcoin's legal grey area, FinCEN issued guidance outlining the applicability of the BSA to virtual currencies.<sup>86</sup> The guidance clarified that "users" of virtual currency are not subject to the MSB requirements, but that "administrators" or "exchangers" must register as MSBs, specifically as money transmitters.<sup>87</sup> According to the guidance, an individual that creates Bitcoins and uses it to purchase goods or services is considered a user, and therefore not subject to the money transmitter requirements.<sup>88</sup> On the other hand, an individual who creates Bitcoins and sells them for real currency is engaged in transmission and subject to the money transmitter requirements.<sup>89</sup> In addition, an individual who accepts Bitcoins from one individual and transfers it to another as part of the acceptance and transfer of another currency is considered an exchanger, and therefore subject to the money transmitter requirements.<sup>90</sup>

While this guidance offered the Bitcoin community some much needed insight, it made some Bitcoin entrepreneurs feel like "modern square pegs being jammed into round regulatory holes meant for ancient business models."<sup>91</sup> This resulting confusion led several businesses to seek further clarification on their status as a money transmitter. Over the next several months, FinCEN publically released a series of administrative rulings advising these companies on their operations.<sup>92</sup> While these rulings help to

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<sup>84</sup> See, e.g., Press Release, Dep't of Justice, Digital Currency Business E-Gold Pleads Guilty to Money Laundering and Illegal Money Transmitting Charges (July 21, 2008), available at <http://www.justice.gov/opa/pr/2008/July/08-crm-635.html>.

<sup>85</sup> Grinberg, *supra* note 11, at 181-82.

<sup>86</sup> See generally FINCEN GUIDANCE, *supra* note 10 (noting that "[t]he Financial Crimes Enforcement Network ('FinCEN') is issuing this interpretive guidance to clarify the applicability of the regulations implementing the Bank Secrecy Act ('BSA') to persons creating, obtaining, distributing, exchanging, accepting, or transmitting virtual currencies").

<sup>87</sup> *Id.* at 1. FinCEN defines a user of virtual currencies as "a person that obtains virtual currency to purchase goods or services." *Id.* at 2 (footnote omitted). An exchanger is defined as "a person engaged as a business in the exchange of virtual currency for real currency, funds, or other virtual currency." *Id.* An administrator is defined as "a person engaged as a business in issuing (putting into circulation) a virtual currency, and who has the authority to redeem (to withdraw from circulation) such virtual currency." *Id.*

<sup>88</sup> *Id.* at 5.

<sup>89</sup> *Id.*

<sup>90</sup> *Id.*

<sup>91</sup> Santori, *What US Businesses Need to Know*, *supra* note 71.

<sup>92</sup> See FIN. CRIMES ENFORCEMENT NETWORK, FIN-2014-R001, APPLICATION OF FINCEN'S REGULATIONS TO VIRTUAL CURRENCY MINING OPERATIONS (2014) (ruling that a user is not a money transmitter if it mines Bitcoins and uses the Bitcoins solely for its own purposes and not for another's benefit); FIN. CRIMES ENFORCEMENT NETWORK, FIN-2014-R007, APPLICATION OF MONEY SERVICES BUSINESS REGULATIONS TO THE RENTAL OF COMPUTER SYSTEMS FOR MINING VIRTUAL CURRENCY (2014) (ruling that renting computers to a third party for mining Bitcoins is not considered money transmission); FIN. CRIMES ENFORCEMENT NETWORK, FIN-2014-R011, REQUEST FOR ADMINISTRATIVE

clarify the status of some parties, others continue to argue that these rulings create even more difficulty for businesses dealing with Bitcoins.<sup>93</sup>

As discussed above, the federal money transmission laws and regulations can be quite burdensome and even more confusing for some Bitcoin entrepreneurs. However, federal law also requires compliance with state money transmission laws.<sup>94</sup> Therefore, compliance with the individual state money transmission laws is just as important, if not more important, than federal compliance.

#### B. *What are the State Money Transmission Laws?*

While federal law requires money transmitters to register with FinCEN, most states require actual licensure.<sup>95</sup> Registration is different from licensure. Recall from the discussion above that the actual registration process with FinCEN is relatively straightforward and can be accomplished by logging onto the website and clicking a few buttons.<sup>96</sup> In contrast, licensure is often a lengthy process and state approval is not guaranteed.<sup>97</sup>

To first understand the state money transmission laws, it is also important to understand the history of the laws. With the growing popularity of traveler's checks and money orders in the early 1900s, states soon realized the need to regulate them.<sup>98</sup> By the 1950s and 1960s, several states had already enacted money transmission laws for consumer protection purposes.<sup>99</sup> Since money transmission requires customers to first give the funds to the intermediary business, many states were concerned that businesses would fail to deliver the money to its intended recipient.<sup>100</sup> For example, some customers, usually with low incomes or without bank accounts, would

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RULING ON THE APPLICATION OF FINCEN'S REGULATIONS TO A VIRTUAL CURRENCY TRADING PLATFORM (ruling that a business that exchanges Bitcoins for legal tender is a money transmitter, even if it only matches buyers and sellers); FIN. CRIMES ENFORCEMENT NETWORK, FIN-2014-R012, REQUEST FOR ADMINISTRATIVE RULING ON THE APPLICATION OF FINCEN'S REGULATIONS TO A VIRTUAL CURRENCY PAYMENT SYSTEM (2014) (ruling that a payment processor who accepts Bitcoins and processes the payment into legal tender is a MSB).

<sup>93</sup> See, e.g., Pete Rizzo, *FinCEN Rules Bitcoin Payment Processors, Exchanges are Money Transmitters*, COINDESK (Oct. 27, 2014, 22:15), <http://www.coindesk.com/fincen-rules-bitcoin-payment-processors-exchanges-money-transmitters/> (noting that, under an interpretation of two October 27, 2014 rulings, any company dealing with Bitcoins could be considered a money transmitter).

<sup>94</sup> 18 U.S.C. § 1960 (2012).

<sup>95</sup> Santori, *Money Transmission on the State Level in the US*, *supra* note 74.

<sup>96</sup> See discussion *supra* Introduction.

<sup>97</sup> Santori, *Money Transmission on the State Level in the US*, *supra* note 74.

<sup>98</sup> AARON GREENSPAN, HELD HOSTAGE: HOW THE BANKING SECTOR HAS DISTORTED FINANCIAL REGULATION AND DESTROYED TECHNOLOGICAL PROGRESS 3 (2011), available at [http://works.bepress.com/cgi/viewcontent.cgi?article=1000&context=aaron\\_greenSPAN](http://works.bepress.com/cgi/viewcontent.cgi?article=1000&context=aaron_greenSPAN).

<sup>99</sup> *Id.*

<sup>100</sup> *Id.*

purchase money orders and then use them to pay bills.<sup>101</sup> However, if the money transmitter went bankrupt before the money order could be cashed, the customer would lose the value of the money order and still owe the bill.<sup>102</sup>

The licensing requirements attempt to minimize these risks, either by ensuring that money transmitters are properly capitalized or to deter nefarious businesses from entering the market.<sup>103</sup> For these reasons, the state money transmitter laws are often considered “safety and soundness” laws.<sup>104</sup>

Prior to the widespread use of the Internet, states required that money transmission businesses have a physical presence in the state where they were licensed.<sup>105</sup> This “physical presence” requirement reflects a period when money transmission was handled by local businesses with a brick-and-mortar presence in the state.<sup>106</sup> Now, money transmitters that operate over the Internet do not need to have a local physical presence and can be used by anyone located in any state.<sup>107</sup> Therefore, online businesses with no physical presence in a state may nevertheless be subject to that state’s jurisdiction and, subsequently, its laws and licensing requirements.<sup>108</sup>

The implication of this is that each state’s licensing requirements have a truly global reach.<sup>109</sup> For that reason, money transmission businesses that operate online must become licensed in each state, even if the business is based in another state or another country.<sup>110</sup> This has special implications for Bitcoins, which “is, by design, a borderless medium of exchange.”<sup>111</sup> Therefore, unless they decide to restrict customer access in certain states, compliant businesses that rely on Bitcoins must be sure that they become licensed within each state before they even open for business.<sup>112</sup>

Presently, forty-eight states and the District of Columbia have money transmission laws<sup>113</sup> and they each vary from state to state.<sup>114</sup> Some states

<sup>101</sup> *See id.*

<sup>102</sup> *See id.*

<sup>103</sup> *See* BRITO & CASTILLO, *supra* note 20, at 10 (2013); Tu, *supra* note 71, at 115.

<sup>104</sup> *See* Tu, *supra* note 71, at 82.

<sup>105</sup> *See, e.g.*, Industry Letter from Jane M. Azia, Dir. of Non-Depository Insts. & Consumer Prot., N.Y. Dep’t of Fin. Servs., Money Transmitters with No Physical Presence in N.Y. (Mar. 31, 2011), available at [http://www.dfs.ny.gov/legal/industry\\_circular/banking/il110331.htm](http://www.dfs.ny.gov/legal/industry_circular/banking/il110331.htm).

<sup>106</sup> *Id.*

<sup>107</sup> *See id.*

<sup>108</sup> *See* Zippo Mfg. Co. v. Zippo Dot Com, Inc., 952 F. Supp. 1119 (W.D. Pa. 1997). *See also* Industry Letter from Jane M. Azia, *supra* note 105 (explaining that businesses with no physical presence within New York that do business within New York are nevertheless subject to its jurisdiction and licensing requirements).

<sup>109</sup> Santori, *Money Transmission on the State Level in the US*, *supra* note 74.

<sup>110</sup> *Id.*

<sup>111</sup> *Id.*

<sup>112</sup> *Id.*

<sup>113</sup> *Id.* Montana and South Carolina do not have money transmission laws. *Id.*

<sup>114</sup> UNIF. MONEY SERVS. ACT, Prefatory Note, § A (amended 2004), 7A U.L.A. 163-64 (2000).

have also started proposing specially tailored money transmission licenses aimed at virtual currency businesses—sometimes referred to as “BitLicenses.”<sup>115</sup> Since state laws differ widely, it is very important for a potential licensee to make a complete analysis as to whether its business activity is considered money transmission.<sup>116</sup>

One issue that has proven difficult for potential licensees, especially those that provide Bitcoin-related services, is whether their activity falls within the definition of money transmission at all.<sup>117</sup> While states generally define money transmitters broadly, incorporating a wide swath of activity, the definitions also differ in each state.<sup>118</sup> For instance, the District of Columbia’s statute is illustrative of the scope often covered, defining money transmission as:

[T]he sale or issuance of payment instruments or engaging in the business of receiving money for transmission or transmitting money within the United States, or to locations abroad, by any and all means, including but not limited to payment instrument, wire, facsimile, or electronic transfer.<sup>119</sup>

As a result, the types of activity covered tend to be very inclusive, with few exceptions.<sup>120</sup> In fact, many other states go even further by including “monetary value,” generally defined as “a medium of exchange[,] whether or not redeemable in money.”<sup>121</sup> Some states, like New York and Massachusetts, have money transmission laws but do not actually define money transmission at all.<sup>122</sup> Other jurisdictions, including the District of Columbia, do not define “money” either.<sup>123</sup> On the other hand, several states have expanded

<sup>115</sup> See e.g., California (A.B. 1326, Assemb., 2014–2015 Reg. Sess. (Cal. 2015)); New York (Revised Proposed Rules for Virtual Currency Businesses, N.Y. Dep’t of Fin. Servs. (proposed Feb. 25, 2015), available at [http://www.dfs.ny.gov/legal/regulations/revised\\_vc\\_regulation.pdf](http://www.dfs.ny.gov/legal/regulations/revised_vc_regulation.pdf)).

<sup>116</sup> Santori, *Money Transmission on the State Level in the US*, *supra* note 74.

<sup>117</sup> *Id.*

<sup>118</sup> See Tu, *supra* note 71, at 87–88; see, e.g., S.D. CODIFIED LAWS § 51A-17-1(13) (2013) (defining money transmission as “engagement in the business of the sale or issuance of payment instruments or stored value or of receiving money or monetary value for transmission to a location within or outside the United States by any means, including wire, facsimile, or electronic transfer”); N.C. GEN. STAT. § 53-208.2(11) (2013) (defining money transmission as “[t]he sale or issuance of payment instruments or stored value” or “[t]he act of engaging in the business of receiving money or monetary value for transmission within the United States or to locations abroad by any and all means, including payment instrument, wire, facsimile, or electronic transfer.”).

<sup>119</sup> D.C. CODE § 26-1001(10) (2013) (emphasis added).

<sup>120</sup> See Tu, *supra* note 71, at 88.

<sup>121</sup> See, e.g., KY. REV. STAT. ANN. § 286.11-003(15) (West 2013); MD. CODE ANN., FIN. INST. § 12-401(l) (West 2013).

<sup>122</sup> See N.Y. BANKING LAW § 640 (McKinney 2013); 7 PA. CONS. STAT. §§ 6101 (2013).

<sup>123</sup> Presumably because, at the time of their original enactments, there was little question as to the meaning of “money”—government-backed currency. See Santori, *Money Transmission on the State Level in the US*, *supra* note 74 (stating that at the time the state money transmission laws were created,

their reach to explicitly include payment mechanisms like stored value products.<sup>124</sup>

To be fair, some states recognize the complexity of their money transmission laws and its application to virtual currencies.<sup>125</sup> Some states recently released guidance discussing the regulatory treatment of Bitcoins under their existing money transmitter laws.<sup>126</sup> Compared to states that are adopting new BitLicense models, these states believe that virtual currency regulation already falls within the scope of the existing regulatory framework.<sup>127</sup> For instance, the Texas and Kansas guidance documents are organized in a manner somewhat similar to FinCEN's guidance and provide an analysis of common virtual currency transactions.<sup>128</sup>

Recently, the National Conference of Commissioners on Uniform State Laws (NCCUSL) has worked to create a standardized set of state money transmission laws, known as the Uniform Money Services Act (UMSA).<sup>129</sup> The purpose of the UMSA is to offer “[a] uniform and consistent approach” to state MSB licensing provisions in order to “provide less of a barrier to competition and growth” for “emerging Internet and

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everyone knew what “money” referred to); Edward Hadas, *A Prediction: Bitcoin Is Doomed to Fail*, N.Y. TIMES (Nov. 27, 2013), [http://dealbook.nytimes.com/2013/11/27/a-prediction-bitcoin-is-doomed-to-fail/?\\_r=0](http://dealbook.nytimes.com/2013/11/27/a-prediction-bitcoin-is-doomed-to-fail/?_r=0) (stating that early commercial activity commonly relied on government-issued money).

<sup>124</sup> See, e.g., MICH. COMP. LAWS § 487.1003(c); ARK. CODE ANN. § 23-55-102(12)(A). Stored value is often defined as “monetary value that is evidenced by an electronic record.” See, e.g., UNIF. MONEY SERVS. ACT § 102(21) (amended 2004), 7A U.L.A. 179 (2000).

<sup>125</sup> See Jerry Siebenmark, *Kansas Bank Commissioner Develops Plan for Bitcoin Transactions*, WICHITA EAGLE (June 17, 2014, 5:00 PM), <http://www.kansas.com/news/business/banking/article/1146428.html> (quoting the Kansas Bank Commissioner).

<sup>126</sup> See, e.g., Regulatory Treatment of Virtual Currencies Under the Kansas Money Transmitter Act, MT 2014-01 (June 6, 2014) [hereinafter Kan. Money Transmitter Act Guidance]; Regulatory Treatment of Virtual Currencies Under the Texas Money Services Act, Supervisory Mem. 1037 (Apr. 3, 2014) [hereinafter Tex. Money Transmitter Act Guidance].

<sup>127</sup> See, e.g., Nuno Menezes, *NCCOB: Bitcoin Regulation Already Within Scope of N. Carolina Money Transmitters Act*, NEWSBTC (Aug. 26, 2014, 4:49 PM), <http://www.newsbtc.com/2014/08/26/nccob-bitcoin-regulation-already-within-scope-n-carolina-money-transmitters-act/> (quoting a spokesperson from the North Carolina Commission of Banks).

<sup>128</sup> See Kan. Money Transmitter Act Guidance, *supra* note 126; Tex. Money Transmitter Act Guidance, *supra* note 125. The Kansas guidance document was modeled after the Texas guidance document. Kan. Money Transmitter Act Guidance, *supra* note 126, at 1 n.2.

<sup>129</sup> See UNIF. MONEY SERVS. ACT (amended 2004), 7A U.L.A. 162-232 (2000).

On a related note, the Conference of State Bank Supervisors (“CSBS”) has also proposed a Draft Model Regulatory Framework for state virtual currency regulatory regimes. STATE REGULATORY REQUIREMENTS FOR VIRTUAL CURRENCY ACTIVITIES, DRAFT MODEL REGULATORY FRAMEWORK & REQUEST FOR PUBLIC COMMENT 1 (Conf. of State Bank Supervisors Dec. 14, 2014). The CSBS developed this framework to “promote consistent state regulation of virtual currency activities.” *Id.* Due to the evolving nature of virtual currencies, the CSBS drafted this framework with the flexibility to adapt to future, unexpected changes. *Id.* At the time of this publication, the CSBS model framework was still in its unfinalized draft stage. See *id.*

electronic payment mechanisms.”<sup>130</sup> The UMSA defines money transmission as “selling or issuing payment instruments, stored value, or receiving money or monetary value for transmission. The term does not include the provision solely of delivery, online or telecommunications services, or network access.”<sup>131</sup>

The UMSA’s approach seems to both extend and narrow its reach. The definition of money transmitter excludes “entities that simply transfer money between parties,”<sup>132</sup> like clearing agents and delivery services, because they “fall outside the scope of a safety and soundness statute.”<sup>133</sup> However, the UMSA has also expanded its scope to account for the fact that certain Internet payment mechanisms act as “the functional equivalent of traditional money transmission.”<sup>134</sup>

Even if they do incorporate statutory definitions, these laws ultimately have left many newer financial services businesses—especially businesses that rely on Bitcoins—confused and unclear as to the applicability of the money transmission laws to their business model.<sup>135</sup> Although FinCEN has released guidance on the matter, states have given very little indication, if any, about how their money transmission laws apply to Bitcoins.<sup>136</sup> Nevertheless, businesses engaging in this type of activity must navigate through the different state laws and their individual interpretations, often incurring very expensive legal fees along the way in an attempt to comply with state regulation.

After a business determines that its activity is considered money transmission, it must then apply for and obtain a license from state regulators. Unlike the federal registration requirements, which are relatively benign, the process of navigating through every jurisdiction’s application process and compliance requirements is often very daunting, with some estimating that the cost of obtaining countrywide licensure could reach up to \$10 million.<sup>137</sup>

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<sup>130</sup> UNIF. MONEY SERVS. ACT, Prefatory Note, § A (amended 2004), 7A U.L.A. 164 (2000).

<sup>131</sup> UNIF. MONEY SERVS. ACT § 102(14) (amended 2004), 7A U.L.A. 178 (2000).

<sup>132</sup> As compared to “[i]nternet payment services that hold customer’s funds or monetary value for their own account.” UNIF. MONEY SERVS. ACT § 102 cmt. 9 (amended 2004), 7A U.L.A. 181 (2000).

<sup>133</sup> UNIF. MONEY SERVS. ACT § 102 cmt. 9 (amended 2004), 7A U.L.A. 181 (2000).

<sup>134</sup> UNIF. MONEY SERVS. ACT, Prefatory Note, § D (amended 2004), 7A U.L.A. 169 (2000).

<sup>135</sup> See Santori, *Money Transmission on the State Level in the US*, *supra* note 74.

<sup>136</sup> See *id.* (“State regulatory bodies have offered little, if any, guidance to bitcoin businesses.”); *but see* Letter from Jim Burns, Investigations Chief, Idaho Dep’t of Fin. (Aug. 21, 2013), in Idaho Dep’t of Fin. Money Transmitter No-Action & Op. Letters 4, available at <http://www.finance.idaho.gov/MoneyTransmitter/Documents/MT%20Interpretations%202013.pdf> (discussing the applicability of the Idaho money transmission laws to a digital currency exchange).

<sup>137</sup> The total estimated cost of obtaining licensure throughout the country, which includes the regulatory costs and legal fees, varies. However, some have placed these costs anywhere from \$2 million to \$10 million. Compare Zachary Warmbrodt, *Bitcoin Gets Ready for the Government*, POLITICO (Nov. 14, 2013, 4:59 PM), <http://dyn.politico.com/printstory.cfm?uuiid=56018484-75CE-4626-A492-EA07C8FD874F> (“The regulatory investment to start a money services business in the United States is a

Specifically, a new money transmission business intending to operate throughout the country can expect annual surety bond premiums of at least \$225,000.<sup>138</sup> Application and licensing fees alone can total over \$70,000, not counting the annual renewal fees that can be just as costly in some states.<sup>139</sup> States also require money transmitters to have a minimum net worth requirement, which range from \$1,000 in Hawaii<sup>140</sup> to \$1,000,000 in Utah.<sup>141</sup> As a result, these costly requirements act as barriers to entry for new startup businesses, keeping competition limited to the older, more established companies like Visa, Western Union, and PayPal.<sup>142</sup>

Additionally, since the actual applications and regulatory requirements vary widely across each state, the actual application process will no doubt take a considerable amount of time, ranging anywhere from weeks to months.<sup>143</sup> For example, many states will require proof that the money transmitter has registered as an MSB with FinCEN;<sup>144</sup> criminal background and credit history checks for the applicant's executive officers, directors, and managers;<sup>145</sup> audited financial statements for the previous two years;<sup>146</sup> a business plan;<sup>147</sup> and a surety bond for the given amount in the statute,<sup>148</sup> among several other requirements.<sup>149</sup> Not only are these requirements logistically difficult, but they will also add up to significant auditors' fees and attorneys' fees.<sup>150</sup>

For a small Bitcoin entrepreneur, this makes obtaining all of the necessary state licenses a very burdensome and expensive venture. Additionally, recall that the federal money transmission law makes operating an unlicensed money transmission business a crime.<sup>151</sup> This is why, in the words of one scholar, "the state level is really where the action is."<sup>152</sup>

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minimum of around \$2 million . . .") with Bailey Reutzler, *FinCEN's Virtual-Money Guidelines Add Roadblocks for New Companies*, PAYMENTSSOURCE (Mar. 19, 2013, 2:50 PM), <http://www.paymentssource.com/news/fincens-virtual-money-guidelines-add-roadblocks-for-new-companies-3013574-1.html> ("Even if new entrants can obtain the proper licensing, the cost of doing so could exceed \$10 million per company . . .").

<sup>138</sup> GREENSPAN, *supra* note 98, at 9.

The total surety bond values can range from approximately \$7,800,000 to \$35,400,000. *Id.*

<sup>139</sup> *Id.*

<sup>140</sup> HAW. REV. STAT. § 489D-6 (2013).

<sup>141</sup> UTAH ADMIN. CODE r. 331-14-4 (2013).

<sup>142</sup> GREENSPAN, *supra* note 98, at 10.

<sup>143</sup> *Id.*

<sup>144</sup> N.H. REV. STAT. ANN § 399-G:5(I) (2013).

<sup>145</sup> IND. CODE § 28-8-4-20 (2014).

<sup>146</sup> KY. REV. STAT. ANN. § 286.11-009(2)(h) (West 2013).

<sup>147</sup> OR. REV. STAT. § 717.220(2)(i) (2013).

<sup>148</sup> VA. CODE ANN. § 6.2-1904 (2013).

<sup>149</sup> See GREENSPAN, *supra* note 98, at 10.

<sup>150</sup> See *id.*

<sup>151</sup> See discussion *supra* Introduction.

<sup>152</sup> Santori, *Money Transmission on the State Level in the US*, *supra* note 74.

### III. *Analysis*

States certainly have a strong interest in protecting their consumers by regulating money transmitters. But at what price? As payment technology continues to evolve at an increasingly rapid rate, state money transmission laws lag behind, leaving many legitimate businesses questioning the legality of their operations.

Businesses in these situations are often forced to take one of three routes: 1) bear the burden of acquiring the necessary state money transmission licenses, 2) skirt the law and hope that their business is not considered money transmission, and 3) cease operations altogether.<sup>153</sup> Until the issues are corrected, the state money transmission laws have the ultimate effect of decreasing competition in the market and chilling innovation.

In fact, the burdens of licensing compliance can be felt throughout the payment services industry in both large and small companies. For example, Tangible Cryptography, a small Virginia-based company, recently suspended its FastCash4Bitcoins service after the Virginia Corporation Commission determined that it may be operating as an unlicensed money transmitter.<sup>154</sup> While the company disputes its activity as money transmission, the threat of enforcement action has forced the company to block access to residents in states that require money transmission licenses and relocate outside of the jurisdictional reach of regulators.<sup>155</sup> Unfortunately, several other companies both big and small have also been put into similar situations.<sup>156</sup> In fact, state financial regulators have only received a few applications for money transmission licenses from Bitcoin-related businesses.<sup>157</sup>

While payment services technology continues to evolve, the money transmission rules often lag behind. Rather than waiting for each state to adapt, only to be once again surpassed by new technology, the federal government should instead preempt state money transmission laws. Federal preemption will not only overcome many of the problems associated with the current regulatory environment, but will continue to maintain the states' goals of consumer protection.

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<sup>153</sup> See Tu, *supra* note 71, at 110.

<sup>154</sup> Tangible Cryptography, *Tangible Cryptography Suspends Bitcoin Related Transactions*, BITCOINTALK.ORG (June 3, 2013, 4:25 AM), <https://bitcointalk.org/index.php?topic=224057.0>.

<sup>155</sup> Tangible Cryptography, *Tangible Cryptography Suspends Bitcoin Related Transactions—Update 8/1/2013*, BITCOINTALK.ORG (Aug. 1, 2013, 7:34 AM), <https://bitcointalk.org/index.php?PHPSESSID=vv0jcphc1abhcfmq9vjnc1i80&topic=224057.msg2848889#msg2848889>.

<sup>156</sup> See *supra* text accompanying note 9.

<sup>157</sup> See Carter Dougherty, *Few Bitcoin-Related License Requests Reported by State Agencies*, BLOOMBERG (Dec. 9, 2013, 2:40 PM), <http://www.bloomberg.com/news/2013-12-09/few-bitcoin-related-license-requests-reported-by-state-agencies.html>.

A. *How Have States Got Money Transmission Regulation Wrong/Right?*

Many of the state-level money transmission regulations are old. It is hard to imagine that when state legislatures and regulatory agencies were originally drafting these rules they could have predicted payments technology beyond services like wire transfers. Indeed, payments technology has advanced significantly over the last few decades. For this reason, current state money transmission regulations are often outdated and ill equipped to handle these modern technological advances in payments technology.

With this in mind, current state money transmission laws are hindering innovation in a still-young virtual currency market: 1) state-by-state laws vary significantly,<sup>158</sup> 2) the definition of money transmission is overly broad and too vague,<sup>159</sup> and 3) the licensing requirements are overly burdensome for small technology startups.<sup>160</sup> As a result, the costs of obtaining money transmission licenses and complying with their requirements across multiple jurisdictions increases exponentially.<sup>161</sup>

First, since the money transmission laws vary significantly on a state-by-state basis, businesses are often required to devote a significant amount of money on legal fees to determine the precise requirements for each state. Attorneys usually go about this process in one of two ways: the first is to conduct a state-by-state survey to see how the business's operations compare to the applicable laws.<sup>162</sup> The second way is to conduct a "no-action" letter campaign, also referred to as a "request for ruling," where the attorney describes the proposed business process and asks the regulator to take "no action" to enforce the licensure requirements.<sup>163</sup> This latter process tends to be more costly, but of course, the regulator can always deny the request (if they even respond at all).<sup>164</sup> As demonstrated by the above examples, the different state money transmitter rules unnecessarily increase information costs due to the varying nature of each state's laws.<sup>165</sup>

Second, even though the NCCUSL adopted the UMSA, there is reason for skepticism as only six states have enacted elements of the UMSA.<sup>166</sup>

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<sup>158</sup> See Tu, *supra* note 71, at 85.

<sup>159</sup> See *id.* at 87-88.

<sup>160</sup> See *id.* at 82.

<sup>161</sup> *Id.* at 92.

<sup>162</sup> Santori, *Money Transmission on the State Level in the US*, *supra* note 74.

<sup>163</sup> *Id.*

<sup>164</sup> *Id.*

<sup>165</sup> See Tu, *supra* note 71, at 109-12.

Even if states move toward a more accommodating licensure framework, such as the BitLicense, the different requirements will still vary state-by-state. As a result, businesses will continue to suffer from the same information cost problem.

<sup>166</sup> *Legislative Fact Sheet – Money Services Act*, UNIF. L. COMM'N, <http://www.uniformlaws.org/LegislativeFactSheet.aspx?title=Money%20Services%20Act> (last visited Oct. 18, 2013). Puerto Rico and the U.S. Virgin Islands have also adopted elements of the UMSA. *Id.*

While the UMSA was drafted to accommodate innovations in emerging online payment mechanisms, the UMSA was last amended in 2004,<sup>167</sup> several years before the release of the Bitcoin software.<sup>168</sup> Though the UMSA includes the regulation of payment mechanisms like e-money and Internet scrip, the decentralized nature of Bitcoins can be interpreted as outside of its reach.<sup>169</sup>

Third, many states define “money transmission” in overly broad and vague terms, leading to confusion among businesses over the law’s applicability to Bitcoin. For businesses that want to avoid the legal risk of remaining unlicensed, they will likely err on the side of caution and apply for licensure. For larger companies, like Google and Facebook, the added expense to mitigate the risk is financially insignificant.<sup>170</sup> However, for smaller startups these costs may be prohibitive, disproportionately preventing them from continuing operations or entering the Bitcoin market.<sup>171</sup>

Finally, the costs associated with the actual licensing and ongoing compliance requirements are also overly burdensome for small technology startups. While the laws were originally meant for traditional money transmitters like Western Union,<sup>172</sup> the inclusive nature of the rules may include some businesses transacting with Bitcoins.<sup>173</sup> For small businesses that do not have the resources to comply with the money transmission requirements, this could also act as a barrier to entry.<sup>174</sup>

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<sup>167</sup> UNIF. MONEY SERVS. ACT (amended 2004), 7A U.L.A. 162-232 (2000).

<sup>168</sup> Satoshi Nakamoto, BITCOIN WIKI, [https://en.bitcoin.it/wiki/Satoshi\\_Nakamoto](https://en.bitcoin.it/wiki/Satoshi_Nakamoto) (last visited Oct. 18, 2013) (“In 2009, he released the first Bitcoin software that launched the network and the first units of the Bitcoin currency.”).

<sup>169</sup> See UNIF. MONEY SERVS. ACT, Prefatory Note, § D (amended 2004), 7A U.L.A. 170-72 (2000).

<sup>170</sup> Tu, *supra* note 71, at 83, 112-13. See Licenses for Google Payment Corp. and Facebook Payments Inc. in *Directory of Money Transmitters*, CAL. DEP’T OF BUS. OVERSIGHT, [http://www.dbo.ca.gov/Licensees/money\\_transmitters/money\\_transmitters\\_directory.asp](http://www.dbo.ca.gov/Licensees/money_transmitters/money_transmitters_directory.asp) (last visited on Mar. 19, 2015).

Facebook’s S-1, the prospectus it filed in its Initial Public Offering (“IPO”), revealed the following information:

Depending on how our Payments product evolves, we may be subject to a variety of laws and regulations in the United States . . . including those governing money transmission . . . . In some jurisdictions, the application or interpretation of these laws and regulations is not clear. To increase flexibility in how our use of Payments may evolve and to mitigate *regulatory uncertainty*, we have applied for certain money transmitter licenses and expect to apply for additional money transmitter licenses in the United States, which will generally require us to demonstrate compliance with many domestic laws in these areas. Our efforts to comply with these laws and regulations *could be costly* and result in diversion of management time and effort and *may still not guarantee compliance*. In the event that we are found to be in violation of any such legal or regulatory requirements, we may be subject to monetary fines or other penalties such as a cease and desist order, or we may be required to make product changes, any of which could have an *adverse effect* on our business and financial results.

Facebook, Inc., Registration Statement (Form S-1), at 24 (Feb. 1, 2012) (emphasis added).

<sup>171</sup> Tu, *supra* note 71, at 83.

<sup>172</sup> *Id.* at 98, 135.

<sup>173</sup> See discussion *supra* Part II.

<sup>174</sup> See Tu, *supra* note 71, at 112-13.

In fact, some states have recognized this problem and have begun to address it. For example, California recently passed legislation aimed at “provid[ing] clarity for existing licensees and assist[ing] with removing barriers to market entry to start-up payment technology companies.”<sup>175</sup> This legislation reduces a licensee’s minimum equity requirement from \$500,000 to \$250,000.<sup>176</sup> States may also consider adopting a set of money transmission regulations specifically for virtual currencies, as New York is currently doing.<sup>177</sup> However, virtual currency-specific regulations would still likely vary from state-to-state and suffer from many of the same problems as the current money transmission laws.

On the other hand, the weaknesses of the state laws may also be their greatest strength. Since state money transmission laws are designed as “safety and soundness” laws primarily to protect consumers,<sup>178</sup> the burdens of licensure should ostensibly deter any weak or bad actors from entering the market. In other words, the argument could be made that if a money transmitter does not have the resources necessary to obtain a license, then it would be too financially unstable to adequately protect its customers during times of financial stress. Additionally, the burdens of obtaining and complying with multiple state licenses should discourage illegitimate businesses from entering the market because regulators would likely uncover the fraudulent activity before the business was able to recover its investment in obtaining the licenses.

However, this argument fails for several reasons. First, overly burdensome regulations still prevent legitimate small entrepreneurs from entering an underdeveloped market. This would have the side effect of forcing otherwise legitimate businesses underground, along with the illegitimate businesses. Second, the goals of consumer protection advanced by state regula-

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<sup>175</sup> Press Release, Roger Dickinson, Assemblymember, Cal. State Assembly, Dickinson Introduces Legislation to Reform Money Transmission Act and Announces Oversight Hearing (Feb. 21, 2013), available at <http://www.asmdc.org/members/a07/press-releases/dickinson-introduces-legislation-to-reform-money-transmission-act-and-announces-oversight-hearing>.

<sup>176</sup> Todd D. Taubert, et al., *California Substantially Reforms Key Money Transmission Law*, LEXOLOGY (Oct. 16, 2013), <http://www.lexology.com/library/detail.aspx?g=7cf9ef0c-7e12-4606-ad0c-5e388c17a0a6>.

<sup>177</sup> Memorandum from Benjamin M. Lawskey, Superintendent of Fin. Servs., N.Y. Dep’t of Fin. Servs., Notice of Inquiry on Virtual Currencies 2 (Aug. 12, 2013), available at <http://www.dfs.ny.gov/about/press2013/memo1308121.pdf> (“DFS is also considering whether it should issue new regulatory guidelines specific to virtual currencies—rather than simply apply existing money transmission regulations. As such, we could also move forward with new guidelines that are tailored to the unique characteristics of virtual currencies.”).

<sup>178</sup> See UNIF. MONEY SERVS. ACT, Prefatory Note, § A (amended 2004), 7A U.L.A. 163 (2000); see also Memorandum from Benjamin M. Lawskey, *supra* note 176, at 2 (noting that firms engaging in money transmission are required to undergo safety and soundness examinations).

tion can be achieved in other more effective ways, some of which will be discussed below.<sup>179</sup>

B. *State Money Transmission Laws Should Be Preempted by the Federal Government*

In order to overcome many of the difficulties associated with the current state money transmission laws, the federal government should preempt the states by adopting a new model of money transmission laws in the United States. This article analyzes two ways in which the federal government could preempt state money transmission laws: the first is by removing state licensure power from the states and consolidating it into the federal government. The second is through “home state” regulation, which would require a business to register in its home state but be able to “export” it throughout the country.

While a thorough evaluation of the constitutional implications of federal preemption is beyond the scope of this article, it is well established that federal preemption is constitutional under the Supremacy Clause<sup>180</sup> and can be achieved by either federal statute or federal regulation.<sup>181</sup> Although the federal government has not specifically preempted state money transmitter laws before, the Supreme Court has recognized federal preemption in several cases related to financial and consumer protection laws.<sup>182</sup> Additionally, the federal government’s ability to regulate money transmitters is also protected by its power to regulate interstate commerce, as contained within the Commerce Clause.<sup>183</sup> For these reasons, federal preemption of state money transmitter laws would likely be constitutional.

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<sup>179</sup> See discussion *infra* Part III.B. For a discussion on additional state money transmission models see also Tu, *supra* note 71, at Part V (discussing alternative approaches to state money transmitter laws that respect the goal of consumer protection).

<sup>180</sup> U.S. CONST. art. VI, cl. 2. See, e.g., *Gade v. Nat’l Solid Wastes Mgmt. Ass’n*, 505 U.S. 88, 108 (1992) (“[U]nder the Supremacy Clause, from which our pre-emption doctrine is derived, ‘any state law, however clearly within a State’s acknowledged power, which interferes with or is contrary to federal law, must yield.’” (quoting *Felder v. Casey*, 487 U.S. 131, 138 (1988))).

<sup>181</sup> See e.g., *Hillsborough Co., Fla. v. Automated Med. Labs., Inc.*, 471 U.S. 707, 713 (1985) (“[S]tate laws can be pre-empted by federal regulations as well as by federal statutes.”); ERWIN CHEMERINSKY, *CONSTITUTIONAL LAW: PRINCIPLES AND POLICIES* 402 (4th ed. 2011).

<sup>182</sup> See, e.g., *Cuomo v. Clearing House Ass’n*, 557 U.S. 519 (2009) (preempting state law enforcement against national banks); *Lorillard Tobacco Co. v. Reilly*, 533 U.S. 525 (2001) (preempting state cigarette advertising laws); *Barnett Bank of Marion Co., N.A. v. Nelson*, 517 U.S. 25 (1996) (preempting Florida state law prohibiting national banks from selling insurance in certain towns); *Marquette Nat’l Bank of Minneapolis v. First Omaha Serv. Corp.*, 439 U.S. 299 (1978) (preempting state usury laws). See also National Securities Markets Improvement Act of 1996, Pub. L. No. 104-290, 110 Stat. 3416 (1996) (preempting states’ blue sky laws).

<sup>183</sup> U.S. CONST. art. I, § 8, cl. 3.

Either of these models will benefit start-up businesses, while still maintaining the goals of anti-money laundering and consumer protection. However, when analyzing the two models, it is important to consider how each will encourage growth, innovation, and efficiency in the payments services market. The ideal model of federal preemption should also take into consideration issues like federalism. For these reasons, this article ultimately recommends adopting a model of money transmission laws that preempts the states through home state regulation.

### 1. Federal Licensure

The first way in which Congress could preempt the states is by requiring money transmitters that work with virtual currencies to instead become licensed exclusively by the federal government. This model of federal licensure is used in several different industries including maritime transportation, nuclear energy, and broadcasting.<sup>184</sup> Essentially, this would move the current consumer protection responsibilities from the states to the federal government, requiring money transmitters to both register and become licensed with FinCEN at the same time.

Moving the state licensure requirement to the federal government has several benefits. First, federal licensure would maintain uniformity, thereby reducing the likelihood of confusion and preserving the goal of consumer protection. This would also increase efficiency and decrease overall transaction costs because licensure and registration would be combined into one single process.

On the other hand, federal licensure has its drawbacks. For instance, consolidating licensure and registration would likely encounter resistance from states that are unwilling to give up a preexisting power. Second, consolidating federal licensure and registration powers into the federal government would create a monopoly of power, arguably disincentivizing the federal government from creating fair regulations. Federal licensure would also prohibit states from competing on regulations, as discussed below.<sup>185</sup>

Although the federal licensure model has its benefits, it is not without its pitfalls. In fact, many of these problems could be addressed through the home state regulation approach.

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<sup>184</sup> See *Federal Licenses & Permits*, U.S. SMALL BUS. ADMIN., <http://www.sba.gov/content/what-federal-licenses-and-permits-does-your-business-need> (last visited Jan. 3, 2013).

<sup>185</sup> See *infra* Part II.B.2.

## 2. Home State Regulations

The second way Congress could preempt state money transmission regulations is through “home state” regulation. In this model, Congress would authorize money transmission businesses to maintain licensure in a state of their choosing and operate in any state under its home state’s license. For example, a company operating an online Bitcoin exchange would only be obligated to obtain a money transmission license in its home state and then operate under it in any U.S. state or territory.<sup>186</sup>

The federal government has adopted similar models before. For example, credit cards, banks, and other financial institutions are permitted to charge the maximum interest rate allowed in their home state, regardless of where their customers are located.<sup>187</sup> This is because in 1978, the Supreme Court held that credit card companies may follow the usury laws of the state in which they are chartered, even to out-of-state customers.<sup>188</sup> It reasoned that the National Bank Act of 1864 intended to facilitate a national banking system and recognized the competitive nature of interstate usury laws.<sup>189</sup> This is why many national credit cards are chartered in South Dakota, because the state does not have usury restrictions.<sup>190</sup>

Under the home state regulation model, states would still be able to maintain similar licensure controls and encourage consumer protection. Furthermore, it would decrease information costs because businesses would not have to worry about state-by-state variations, the concerns about regulations being overly broad or vague would be reduced because they would only have to become licensed in one state, and the burdens of individual state licensure and compliance would be mitigated by the fact that businesses would be able to focus their resources on one state license.

However, the strongest argument for home state regulation is that it would incentivize state-by-state competition. Since businesses only have to become licensed in one state, they will pick the state with the most favorable licensing requirements. States would want to maintain competitive licensing requirements in order to entice Bitcoin-related businesses to their state for the increased tax revenue and job opportunities. Ultimately state governments, the federal government, and businesses would benefit because home state regulation encourages entrepreneurship, market growth, and innovation while also maintaining effective regulatory control.

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<sup>186</sup> Note that the money transmitter would still have to register with FinCEN.

<sup>187</sup> Leslie McFadden, *Credit Cards Trump State Usury Law*, BANKRATE, <http://www.bankrate.com/finance/credit-cards/credit-cards-trump-state-usury-law.aspx> (last visited Oct. 18, 2013).

<sup>188</sup> See *Marquette Nat’l Bank v. First of Omaha Service Corp.*, 439 U.S. 299, 313-14 (1978).

<sup>189</sup> See *id.*

<sup>190</sup> S.D. CODIFIED LAWS § 54-3-1.1 (2013).

## CONCLUSION

The innovations behind the Bitcoin network have the potential to greatly improve current payment services. The benefits of using Bitcoins range from increased financial privacy to cheaper transaction costs, however the benefits of this technology have also attracted the use of Bitcoins for nefarious purposes like laundering money. These drawbacks illustrate the need for strong, but fair regulation. However, these regulations, particularly at the state level, have a chilling effect on growth in a still-young market.

In particular, there are several reasons why state money transmission regulations should be reformed. Presently, the state money transmission rules vary significantly state-by-state,<sup>191</sup> the applicability of the laws is overly broad and vague,<sup>192</sup> and the licensure requirements are too burdensome for small entrepreneurs.<sup>193</sup> As a result, many businesses and individuals that use Bitcoins have been hesitant to proceed out of fear of state enforcement actions.

This article advocates for Congress to preempt state money transmission regulation by adopting a system based on home state regulation. Not only would home state regulation overcome the difficulties faced by the current system of state-by-state licensure, but it would also encourage growth and innovation in the Bitcoin market.

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<sup>191</sup> See Tu, *supra* note 71, at 85.

<sup>192</sup> See *id.* at 87-88.

<sup>193</sup> See *id.* at 82-83.



THE CURIOUSLY DIFFICULT TASK OF DETERMINING WHO OWNS  
A COPY OF A COPYRIGHTED WORK

*Daniel Schneider\**

INTRODUCTION

Most everyday objects contain some copyrighted material, for example, the labels on shampoo bottles and designs on watches.<sup>1</sup> And every time one runs a program on a computer or smartphone, a copy of that—likely copyrighted—software is copied from disk into memory.<sup>2</sup> Without an exception, it is copyright infringement to sell something with a copyrighted label or design, or execute copyrighted software.<sup>3</sup> However, an owner of a copy of copyrighted work has two important privileges: the right to resell the copy without permission from the copyright holder and, for computer programs, the right to make any copies which are necessary to run, back up, or repair the program.<sup>4</sup> For these protections to be useful, they must be predictable; however, even the preliminary issue of which jurisdiction's law governs the ownership of individual copies is unsettled.

If the choice of law issue could be confined to a choice between federal and state law, then it would not be as acute because there is substantial uniformity among state sales laws.<sup>5</sup> However, the Supreme Court recently clarified that the first sale doctrine, the rule that an owner of a copyrighted work can dispose of that copy without the copyright holder's permission, applies even if the copy was manufactured in a foreign country and sold in a transaction between two foreigners under foreign law.<sup>6</sup> In many foreign countries ownership passes to the buyer in transactions that would be deemed mere licenses—which do not affect ownership—under U.S. law.<sup>7</sup>

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<sup>1</sup> See *Quality King Distribs., Inc. v. L'anza Research Int'l, Inc.*, 523 U.S. 135, 138-39 (1998); *Omega S.A. v. Costco Wholesale Corp.*, 541 F.3d 982, 983-84 (9th Cir. 2008), *aff'd by an equally divided court*, 131 S. Ct. 565 (2010) (mem.).

<sup>2</sup> *MAI Sys. v. Peak Computer*, 991 F.2d 511, 519 (9th Cir. 1993).

<sup>3</sup> See 17 U.S.C. § 106 (2012).

<sup>4</sup> See 17 U.S.C. §§ 109, 117.

<sup>5</sup> Every state besides Louisiana has enacted all or part of Article 2 of the Uniform Commercial Code ("UCC"), the subdivision on sales. *Uniform Commercial Code Locator*, LEGAL INFO. INST., <http://www.law.cornell.edu/uniform/ucc.html> (last visited Oct. 18, 2013). For a discussion of cases where there are still difficult choice of law issues in the domestic context see *infra* Part II.E.

<sup>6</sup> *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1371 (2013).

<sup>7</sup> See generally Alice J. Won, *Exhausted? Video Game Companies and the Battle Against Allowing the Resale of Software Licenses*, 33 J. NAT'L ASS'N ADMIN. L. JUDICIARY 386 (2013) (contrasting United States and European Union law on the interpretation of license agreement for video games).

The globalization of first sale makes the choice of law issue more difficult and more pressing.

If one purchases a book marked “authorized for sale in Europe, Asia, Africa, and the Middle East only and may not be exported out of those territories” one has a right to resell anywhere—regardless of the notice.<sup>8</sup> Likewise, a transaction in a foreign jurisdiction that the local law deems a sale of a digital copy should give the same rights. The first sale doctrine is both a substantive rule of copyright law and an imprint left by the common law rule against restrictions on the alienation of chattels.<sup>9</sup> Under both modern and traditional choice of law rules, the owner of a chattel is determined by the law of the place of delivery. Just as the traditional rule against restraints on alienation was brought in from property law and applied to copyrighted works, the ownership of individual copies—digital or physical—should also be determined by the law of the place of delivery or download.

To understand the choice of law issues one confronts when determining the ownership of a digital copy, one must have some background in the substance and history of copyright law.<sup>10</sup> The development of the first sale doctrine illustrates the legal protections given to owners of particular copies, while the rise of licensing of digital copies provides an example of an alternative regime without those protections.<sup>11</sup> However, many interpretations of license agreements do not properly distinguish between the separate fields of copyright law, contract law, and ordinary property law.<sup>12</sup> It is necessary to differentiate between these different fields to properly analyze the choice of law issue because contract law, copyright law, and ordinary property law are governed by different choice of law rules.<sup>13</sup>

## I. BACKGROUND

A copyrighted work is affected by both ordinary property law and intellectual property law. The potential for tension between copyright law and ordinary property law makes ownership more complicated for a copyrighted work than for a loaf of bread.<sup>14</sup> This tension has been resolved differently for physical copies and digital copies. Congress and the courts have, over the course of the last century, established that physical copies

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<sup>8</sup> *Kirtsaeng*, 133 S. Ct. at 1356.

<sup>9</sup> *Id.* at 1363.

<sup>10</sup> For this background see *infra* Part I.

<sup>11</sup> See *infra* Part I.B-C.

<sup>12</sup> See *infra* Part II.

<sup>13</sup> For the choice of law analysis itself see *infra* Part III.

<sup>14</sup> See *infra* Part I.A.

should generally be treated like any other chattel.<sup>15</sup> However, many courts have given copyright holders more control over digital copies.<sup>16</sup>

### A. *Outline of Copyright Law*

A copyright, fundamentally, provides its holder with protection of the exclusive rights found in 17 U.S.C. § 106.<sup>17</sup> A copyright holder has exclusive rights to copy the work, create derivative works based on the work, distribute the work, publicly perform the work, and publicly display the work.<sup>18</sup> These rights allow the owner of the copyright to maintain exclusive economic control of the work, to the extent that control is consistent with background principles of the common law and antitrust jurisprudence.<sup>19</sup>

A copy of a copyrighted work is any physical manifestation of the work in any form.<sup>20</sup> While one may colloquially differentiate between the “digital” and “physical,” digital copies are sufficiently fixed and tangible to be copies separate from the intangible copyright.<sup>21</sup>

The exclusive rights in § 106 do not give the copyright holder a property right in individual copies of the work.<sup>22</sup> The Copyright Act explicitly states that the ownership of a copyright and the ownership of a copy are distinct.<sup>23</sup> Further, transfer of a copy does not transfer copyright, nor does transfer of a copyright transfer any copies.<sup>24</sup> This rule makes good sense; if the transfer of a copy transferred a copyright then the copyright would have little value because anyone who owned a copy could reproduce it without paying royalties.<sup>25</sup> Likewise, if a transfer of copyright conveyed an interest

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<sup>15</sup> See *infra* Part I.B.

<sup>16</sup> See *infra* Part I.C.

<sup>17</sup> *C.f.* 17 U.S.C. § 301 (2012) (preempting state causes of action within “the general scope of copyright as specified by § 106”).

<sup>18</sup> 17 U.S.C. § 106.

<sup>19</sup> See *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1363, 1371 (2013).

<sup>20</sup> 17 U.S.C. § 101 (“‘Copies’ are material objects . . . in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.”).

<sup>21</sup> See, e.g., *MAI Sys. v. Peak Computer*, 991 F.2d 511, 519 (9th Cir. 1993) (holding that copies of software, even momentarily held in RAM, are fixed copies). Further, the limitations in 17 U.S.C. § 117(a), allowing an owner of computer software to create copies of it if necessary to use it, would not make sense if the software loaded onto a computer was not a separate copy.

<sup>22</sup> 17 U.S.C. § 202.

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> A similar worry arose in *Bowman v. Monsanto Co.*, a recent Supreme Court patent law case addressing “whether a farmer who buys patented seeds may reproduce them through planting and harvesting without the patent holder’s permission.” *Bowman v. Monsanto Co.*, 133 S. Ct. 1761, 1765 (2013). The Court held that the farmer could not replant the seeds because “if simple copying were a

in individual copies, then when an author signed with a new publisher, they could demand the return of all printed copies of their book.

Sections 107 through 122 of the Copyright Act create exceptions to the exclusive rights granted to copyright holders.<sup>26</sup> Two of these exceptions require the party asserting the exception to be the “owner” of the copy.<sup>27</sup> First, § 109 codifies the first sale doctrine—the rule that an owner of a copy can alienate that copy without the consent of the copyright owner.<sup>28</sup> Second, § 117 allows the owner of a copy of computer program to create temporary copies as necessary for normal use, repair, and backup.<sup>29</sup>

### B. *History of First Sale*

While § 117 is an important modernization of the copyright law, which allows it to function with digital technology, the first sale doctrine is a more structurally important provision. Without the first sale doctrine, a copyright holder could dictate terms of every downstream transfer of a copyrighted work, or block transfers altogether.<sup>30</sup> These concerns about alienation led to the development of the doctrine.<sup>31</sup>

This is most explicit in *Bobbs-Merrill v. Straus*—the Supreme Court’s first case addressing the first sale doctrine.<sup>32</sup> When it was decided in 1908, there was no explicit statutory basis for the first sale doctrine.<sup>33</sup> The Supreme Court, instead, formed the first sale doctrine as a statutory construc-

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protected use, a patent would plummet in value after the first sale of the item containing the invention.” *Id.* at 1769.

<sup>26</sup> See 17 U.S.C. § 106 (“Subject to sections 107 through 122, the owner of copyright under this title has the exclusive rights to do and to authorize any of the following . . . .”); see also §§ 107-22 (enumerating the exceptions).

<sup>27</sup> See 17 U.S.C. §§ 109, 117.

<sup>28</sup> See 17 U.S.C. § 109; *Quality King Distribs., Inc. v. L’anza Research Int’l, Inc.*, 523 U.S. 135, 143 (1998) (stating that § 109 codified the first sale doctrine of *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339 (1908)).

<sup>29</sup> 17 U.S.C. § 117.

<sup>30</sup> In *Bobbs-Merrill Co. v. Straus*, the publisher tried to dictate the price term in downstream contracts. *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339 (1908). While § 106 explicitly gives the copyright holder “exclusive rights to . . . distribute copies . . . to the public by sale or other transfer of ownership.” 17 U.S.C. § 106.

<sup>31</sup> See *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1363 (2013).

<sup>32</sup> *Bobbs-Merrill Co.*, 210 U.S. 339; see also *Quality King*, 523 U.S. at 140-42 (discussing *Bobbs-Merrill* and the background of the first sale doctrine).

<sup>33</sup> *Bobbs-Merrill Co.*, 210 U.S. at 346, 348 (construing language from the Copyright Act of 1891, sec. 4952, 26 Stat. 1107 (1891), granting “the sole liberty of . . . vending the [work].”); see also *Quality King*, 523 U.S. at 141-42 (discussing *Bobbs-Merrill Co.* and its context).

tion to avoid an absurd result.<sup>34</sup> In that case, the copyright holder printed, adjacent to the copyright notice, that there is no license for any retailer to sell the book for less than one dollar.<sup>35</sup> A retailer purchased copies of the book from wholesalers and resold it for eighty-nine cents.<sup>36</sup> The Court was aghast at the idea that Congress

intended to create a right which would permit the holder of the copyright to fasten, by notice in a book . . . a restriction upon the subsequent alienation of the subject-matter of copyright after the owner had parted with the title to one who had acquired full dominion over it and had given a satisfactory price for it.<sup>37</sup>

After the first sale, the copyright holder had no right to control the disposition of any copy of the work.<sup>38</sup>

In response, Congress codified the first sale doctrine in 1909.<sup>39</sup> As originally codified, any person who “lawfully obtained” a copy had the right to alienate it.<sup>40</sup> This was changed in 1976 to the current language that “the owner of a particular copy or phonorecord lawfully made under this title, or any person authorized by such owner, is entitled, without the authority of the copyright owner, to sell or otherwise dispose of the possession of that copy or phonorecord.”<sup>41</sup>

From the enactment in 1976 until 2013 there was considerable controversy. Three Supreme Court cases<sup>42</sup> considered the meaning of the phrase “lawfully made under this title.”<sup>43</sup> Many copyright holders interpreted that phrase to mean the first sale doctrine only applied domestically since “this title” is domestic law.<sup>44</sup> This geographic view of first sale was rejected by the Supreme Court in stages.<sup>45</sup>

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<sup>34</sup> See *Bobbs-Merrill Co.*, 210 U.S. at 350-51 (“To add to the right of exclusive sale the authority to control all future retail sales . . . [would] extend [the statute’s] operation, by construction, beyond its meaning.”).

<sup>35</sup> *Id.* at 341.

<sup>36</sup> *Id.* at 341-42.

<sup>37</sup> *Id.* at 349-50.

<sup>38</sup> *Id.* at 350-51.

<sup>39</sup> *Quality King Distribs., Inc. v. L’anza Research Int’l, Inc.*, 523 U.S. 135, 142 n.7 (1998).

<sup>40</sup> Copyright Act of 1909, ch. 320, 35 Stat. 1084 (1909).

<sup>41</sup> See 17 U.S.C. § 109 (2012); Copyright Act of 1976, sec. 109, Pub. L. No. 94-553, 90 Stat. 2541 (1976).

<sup>42</sup> See *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351 (2013); *Costco Wholesale Corp. v. Omega S.A.*, 131 S. Ct. 565 (2010); *Quality King*, 523 U.S. 135.

<sup>43</sup> 17 U.S.C. § 109.

<sup>44</sup> *Kirtsaeng*, 133 S. Ct. at 1359 (characterizing the position of the copyright holder in that case). See also MELVILLE B. NIMMER & DAVID NIMMER, *NIMMER ON COPYRIGHT* § 14.05 (2013) (“Because copyright laws do not have any extraterritorial operation, no cause of action exists to recover damages under the Copyright Act for infringement occurring outside the United States.” (footnotes omitted)).

<sup>45</sup> See *Kirtsaeng*, 133 S. Ct. at 1371; *Quality King Distribs., Inc. v. L’anza Research Int’l, Inc.*, 523 U.S. 135, 145 (1998).

The primary incentive for copyright owners to argue for a geographic view of “lawfully made under this title”<sup>46</sup> is that it allows them to segment markets across national boundaries.<sup>47</sup> While it is true that perfect, omniscient market segmentation can be economically efficient, it is only efficient to the extent that producers are able to capture the consumer surplus.<sup>48</sup> However, coarse market segmentation along national boundaries—which is all that the geographic view would create—has no guarantee of efficiency.<sup>49</sup> And regardless of economic efficiency, copyright law does not itself protect copyright owners’ power to segment markets.<sup>50</sup>

The Supreme Court first interpreted “lawfully made under this title” in *Quality King v. L’anza Research*.<sup>51</sup> In that case the Supreme Court held that the first sale protection of § 109 applied to the purchaser of hair care products with copyrighted labels which were manufactured in the United States but where sale occurred overseas.<sup>52</sup>

The *Omega* case presented the issue of whether a watch with a copyrighted design that was manufactured in a foreign country could still be “lawfully made under this title.”<sup>53</sup> However, the Court was equally divided so there was no holding in that case.<sup>54</sup>

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<sup>46</sup> 17 U.S.C. § 109.

<sup>47</sup> See, e.g., *Kirtsaeng*, 133 S. Ct. at 1370-71.

<sup>48</sup> To get to this result one must assume a monopoly provider of the good who can perfectly determine the reservation price of each customer. See Daniel J. Gifford & Robert T. Kudrle, *The Law and Economics of Price Discrimination in Modern Economies: Time for Reconciliation?*, 43 U.C. DAVIS L. REV. 1235, 1239-41 (2010). This will allow the monopolist to provide each unit demanded at the reservation price of the buyer, instead of at the point where marginal value equals marginal cost, removing all consumer surplus but without dead weight loss. *Id.* at 1241. Relaxing any of these assumptions will give less efficiency but leave more consumer surplus in consumers’ hands. *Id.* at 1241-43. So a segmented market is efficient to the extent it transfers consumer surplus to producers. See James Boyle, *Cruel, Mean, or Lavish? Economic Analysis, Price Discrimination and Digital Intellectual Property*, 53 VAND. L. REV. 2007, 2025-26 (2000). However, some argue that this type of price discrimination benefits poor countries by allowing publishers to recoup expenses in rich countries and sell copies cheaply in poor countries. Clark D. Asay, *Kirtsaeng and the First Sale Doctrine’s Digital Problem*, 66 STAN. L. REV. 17, 21 (2013). However, allowing price discrimination for copyrighted works cannot be the most efficient means of humanitarian aid.

<sup>49</sup> See Gifford & Kudrle, *supra* note 48, at 1241-43.

<sup>50</sup> When considering whether removal of publishers’ ability to segment markets was legally significant, the *Kirtsaeng* Court noted that “[w]hether copyright owners should, or should not, have more than ordinary commercial power to divide international markets is a matter for Congress to decide”—and they had not given them that power. *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1371 (2013).

<sup>51</sup> *Quality King Distrib., Inc. v. L’anza Research Int’l, Inc.*, 523 U.S. 135 (1998).

<sup>52</sup> See 17 U.S.C. § 109 (2012); *Quality King*, 523 U.S. at 138-39, 151-52.

<sup>53</sup> *Petition for Writ of Certiorari*, at i, *Costco Wholesale Corp. v. Omega S.A.*, 131 S. Ct. 565 (2010) (No. 08-1423), 2009 WL 1398912.

<sup>54</sup> *Costco Wholesale Corp. v. Omega S.A.*, 131 S. Ct. 565 (2010).

The *Kirtsaeng* case presented substantially the same issue as *Omega*.<sup>55</sup> In that case, the copyrighted works were foreign-manufactured textbooks purchased in Thailand and marked “authorized for sale in Europe, Asia, Africa, and the Middle East only and may not be exported out of those territories.”<sup>56</sup> The Court held that, as long as a copy produced in a foreign country would be lawfully made if United States copyright law had applied, it was lawfully made under this title.<sup>57</sup> The Court also suggested that the common law rule against restraints on alienation of chattels should be used to interpret § 109; it even interpreted the phrase “lawfully made under this title”—not itself a restraint on alienation—to avoid the potential for such restraints.<sup>58</sup>

### C. *Incentive to Move to Licensing Arrangements*

However, there is still a way for copyright owners to segment markets and otherwise control downstream use. Even if a copy is lawfully made, a person must own the copy to take advantage of the first sale doctrine.<sup>59</sup> A copyright license, which only affects rights under copyright and not rights in individual copies, does not transfer ownership of the copy.<sup>60</sup> Therefore, where a copyright owner can license directly to end users instead of selling copies, the copyright owner can segment markets, potentially down to the individual, and impose other restraints on alienation.

For digital copies, United States courts are willing to treat most things that are styled as licenses as granting only a license and not transferring ownership.<sup>61</sup> This gives an incentive to copyright holders to license instead of selling digital copies, since they can impose restraints on alienation on the licensed copies.<sup>62</sup> And thus, End User License Agreements pervade one’s digital existence.

However, some foreign jurisdictions will find that a sale has been made where a United States court would hold that only a license was issued.<sup>63</sup> As these licensing arrangements proliferate, it becomes more im-

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<sup>55</sup> *Kirtsaeng*, 133 S. Ct. at 1357.

<sup>56</sup> *Id.* at 1356.

<sup>57</sup> *Id.* at 1358.

<sup>58</sup> *Id.* at 1363.

<sup>59</sup> 17 U.S.C. § 109 (2012). The same is true for the special rules for computer programs in § 117. *Id.* § 117.

<sup>60</sup> For a further discussion of what a copyright license means, see *infra* Part II.A.

<sup>61</sup> *See, e.g.*, *Vernor v. Autodesk, Inc.*, 621 F.3d 1102 (9th Cir. 2010).

<sup>62</sup> *Asay*, *supra* note 48, at 18.

<sup>63</sup> *See generally* *Won*, *supra* note 7, at 389-98, 405-14 (discussing the effect of a European Court of Justice case, *Case C-128/11, UsedSoft GmbH v. Oracle Int’l Corp.*, 2012 E.C.R. I-00000, ruling that a software license agreement exhausted E.U. copyright and the contrary position taken by most United States courts).

portant to determine whether a transaction that is a sale of a digital copy under foreign law transfers ownership for purposes of § 109.<sup>64</sup>

The incentive to use licensing arrangements is supported by the protections provided in the Digital Millennium Copyright Act's digital rights management (DRM) anticircumvention provisions. This law makes it illegal to remove DRM, even if it is for the purpose of doing something otherwise legal, such as reselling an owned copy.<sup>65</sup> Therefore, at least in the United States, copyright owners can shut down secondary markets for digital copies by including a restrictive DRM.<sup>66</sup> This gives copyright holders another method to control downstream use, which allows for more complete price discrimination for digital copyrighted goods.

## II. UNTANGLING THE GNARLED MASS OF COPYRIGHT, SALES, AND PROPERTY LAW IN COPYRIGHT LICENSE AGREEMENTS

There are three systems of law that govern at least part of a typical license agreement:<sup>67</sup> contract law, property law, and copyright law.<sup>68</sup> Contract law is used to interpret the terms of the agreement; property law determines who owns the fixed copy; and copyright law determines the extent to which the licensee can do those things otherwise illegal under § 106.<sup>69</sup> These separate areas of law are frequently conflated by courts and commentators.<sup>70</sup> Which area of law a given provision falls under can affect the outcome of the case.<sup>71</sup> Further, it could potentially trigger thousands of dollars of statutory damages and criminal liability if a licensing agreement is found to fall under a copyright.<sup>72</sup>

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<sup>64</sup> 17 U.S.C. § 109.

<sup>65</sup> See 17 U.S.C. § 1201.

<sup>66</sup> See Victor F. Calaba, *Quibbles 'n Bits: Making Digital First Sale Doctrine Feasible*, 9 MICH. TELECOMM. TECH. L. REV. 1, 19-20 (2002). However, there is proposed legislation which would make § 1201 not apply to circumventions where "the purpose of such circumvention is to engage in a use that is not an infringement of copyright under this title." H.R. 1892, 113th Cong. (2013). This would make a circumvention of DRM for the purpose of reselling copies that one owned legal, which would solve the problem of copyright owners being able to shut down secondary markets.

<sup>67</sup> This article will use the term "license agreement" to refer to an agreement or contract that includes, or purports to include, a copyright license but also includes other provisions.

<sup>68</sup> See generally Christopher M. Newman, *A License is Not a "Contract Not to Sue": Disentangling Property and Contract in the Law of Copyright Licenses*, 98 IOWA L. REV. 1101 (2013) (arguing for clearer distinctions between these sources of law in interpreting copyright licenses).

<sup>69</sup> See 17 U.S.C. §§ 106, 202, 302; NIMMER & NIMMER, *supra* note 44, §§ 2.03[C], 10.15[A][1]-[2].

<sup>70</sup> For a detailed discussion of the nature of copyright licenses and the interpretive confusion surrounding them, see generally Newman, *supra* note 68.

<sup>71</sup> See, e.g., MDY Indus., LLC v. Blizzard Entm't, Inc., 629 F.3d 928, 941 (9th Cir. 2010).

<sup>72</sup> The Copyright act provides for statutory damages of up to \$30,000 per infringed work, or \$150,000 if the infringement was willful. 17 U.S.C. § 504(c). And a criminal conviction for copyright

The first step in separating these areas of law is determining which terms of the larger license agreement are—or purports to be—a copyright license.<sup>73</sup> Contract law can then be used to interpret the remaining terms, both the basic covenants and the conditions on the transfers of property or copyright interests.<sup>74</sup> Then one can use copyright law to determine the nature, scope, and validity of the copyright license.<sup>75</sup> Finally, property law can be used to interpret the legal ownership of copies, either through explicit transfers of ownership or invalid licenses which in fact transfer ownership.<sup>76</sup>

### A. *Defining Licenses*

A license, generically is “[a] permission, usu[ally] revocable, to commit some act that would otherwise be unlawful” or “[t]he certificate or document evidencing such permission.”<sup>77</sup> In the realm of real property licenses, the generally illegal act is the use of another person’s land.<sup>78</sup> The analogous wrongful act in the realm of copyright is infringement, such as copying, unauthorized sale, or public performance.<sup>79</sup>

A license agreement will typically include terms that are not simply giving permission to the licensee to do something that would otherwise be copyright infringement.<sup>80</sup> When these ancillary terms are included, it is necessary to determine what area of law should be used to interpret each term.

### B. *The Scope of Contract Law in Interpreting License Agreements*

It is first necessary to determine whether contract law is the only relevant law. One could view a license as “a promise not to sue for copyright

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infringement could be punished by ten years imprisonment, fines, forfeiture, and restitution. 17 U.S.C. § 506; 18 U.S.C. § 2319, 2323.

<sup>73</sup> See *infra* Part II.A.

<sup>74</sup> See *infra* Part II.B.

<sup>75</sup> See *infra* Part II.C.

<sup>76</sup> See *infra* Part II.D.

<sup>77</sup> BLACK’S LAW DICTIONARY 1102 (9th ed. 2009).

<sup>78</sup> RESTATEMENT (FIRST) PROPERTY § 512 (1944).

<sup>79</sup> See 17 U.S.C. § 106 (2012). There are other things that are made illegal under the copyright laws, such as circumventing DRM, see 17 U.S.C. § 1201 (2012), but the core protection of copyright is the exclusive rights granted in § 106. See NIMMER & NIMMER, *supra* note 44, § 12A.18 (noting that violations of the DRM circumvention provisions are not copyright infringement).

<sup>80</sup> See, e.g., MDY Indus., LLC v. Blizzard Entm’t, Inc., 629 F.3d 928, 939-42 (9th Cir. 2010) (as amended) (holding that a “glider” or software program that automatically played a video game in violation of the license agreement was a breach of contract, not copyright infringement).

infringement.<sup>81</sup> However, licenses without consideration are valid.<sup>82</sup> Likewise, breach of a term of a license agreement by the licensee does not necessarily release the licensor from the prospective duty not to sue.<sup>83</sup> Therefore, a license itself is not a contract.<sup>84</sup>

However, a license agreement is a contract.<sup>85</sup> This leaves open which terms in a license agreement are governed by contract law. This issue, as it has been formulated in the legal literature<sup>86</sup> and debated by courts,<sup>87</sup> focuses on the distinction between conditions of the license and other covenants. In this structure, covenants are general contract terms, breach of which gives rise to contract remedies, and conditions of the license are terms where the violation gives rise to copyright remedies.<sup>88</sup> This distinction, on its own, is circular since it defines the type of term in relation to its attendant remedy, which in turn depends on which type of term it is. However, courts have used traditional contract rules governing conditions precedent to differentiate between conditions of the license and covenants.<sup>89</sup> Therefore, both covenants and conditions are interpreted under contract law, but violation of a condition gives remedies in copyright law while violation of a covenant gives remedies in contract law.<sup>90</sup>

### C. *The Scope of Copyright Law in Interpreting License Agreements*

An owner of real property has the right to exclude others from entering the property and can grant or revoke licenses to enter and use the property.<sup>91</sup>

<sup>81</sup> *Jacob Maxwell, Inc. v. Veeck*, 110 F.3d 749, 753 (11th Cir. 1997); *c.f.* *Harris v. Emus Records Corp.*, 734 F.2d 1329, 1334 (9th Cir. 1984) (“Under patent law, a license has been characterized as an agreement not to sue the licensee for infringement.”).

<sup>82</sup> NIMMER & NIMMER, *supra* note 44, § 10.03[A][8]. However, a nonexclusive license will be revocable if there is not consideration. *Id.* Further, § 203 allows the termination of both exclusive and nonexclusive licenses—even if there is a valid agreement to the contrary. 17 U.S.C. § 203.

<sup>83</sup> *Graham v. James*, 144 F.3d 229, 236 (2d Cir. 1998); *see also Newman*, *supra* note 68, at 1103-05 (describing several hypotheticals where breach of a license term will not create a right to sue for copyright infringement).

<sup>84</sup> *But see Jacobsen v. Katzer*, 535 F.3d 1373, 1378-79 (Fed. Cir. 2008) (using an extremely broad definition of consideration to hold that potential acclaim from the attribution required under the *Artistic License 1.0*, OPEN SOURCE INITIATIVE (last visited Oct. 15, 2013), <http://opensource.org/licenses/Artistic-1.0>, was sufficient consideration to form a contract with a downstream licensee).

<sup>85</sup> *Graham*, 144 F.3d at 236-37.

<sup>86</sup> *See, e.g.*, NIMMER & NIMMER, *supra* note 44, § 10.15[A].

<sup>87</sup> *See, e.g.*, *Graham*, 144 F.3d at 236-37 (quoting NIMMER & NIMMER, *supra* note 44, § 10.15[A]).

<sup>88</sup> NIMMER & NIMMER, *supra* note 44, § 10.15[A] (2013).

<sup>89</sup> *See, e.g.*, *Effects Assocs. v. Cohen*, 908 F.2d 555, 559 n.7 (9th Cir. 1990).

<sup>90</sup> *Jacobsen v. Katzer*, 535 F.3d 1373, 1380 (Fed. Cir. 2008).

<sup>91</sup> *See* 53 C.J.S. *Licenses* § 133 (2013).

These licenses are governed by property law.<sup>92</sup> Likewise, a copyright grants the owner a right to exclude others from violating the rights granted in § 106 and the copyright holder can grant and revoke licenses concerning those rights.<sup>93</sup> For intellectual property law to parallel the background principles of property law, copyright licenses should be governed by copyright law.

Also, there are many ways in which the copyright statutes explicitly control copyright licenses, evincing some congressional intent for copyright licenses to be controlled by copyright law. The Copyright Act includes exclusive licenses in the definition of “transfer of copyright ownership.”<sup>94</sup> Section 203 explicitly gives copyright holders, in proper circumstances, the inalienable right to terminate copyright licenses during the five-year period from thirty-five to forty years from the date of grant or publication.<sup>95</sup> And § 205 protects the rights of nonexclusive licensees during a transfer of copyright ownership.<sup>96</sup> These statutory definitions of—and controls on—copyright licenses could be interpreted to bring copyright licenses under the control of the Copyright Act.

However, the scope of copyright law in most license agreements is relatively small. It only governs those terms that grant the right to do something prohibited by the Copyright Act.<sup>97</sup> A violation of a condition of a license could give rise to a copyright infringement liability, but whether it was a condition or a covenant would still be a matter of contract law.<sup>98</sup> Only those issues relating to the license itself, such as revocability under § 203, should be governed by copyright law.<sup>99</sup>

#### D. *The Scope of Property Law in Interpreting License Agreements*

The law of chattels governs copies and the law of copyright governs copyrights.<sup>100</sup> It is made explicit in § 202 of the Copyright Act that a trans-

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<sup>92</sup> RESTATEMENT (FIRST) PROPERTY § 512 (1944); *c.f.* RESTATEMENT (THIRD) PROPERTY (SERVITUDES) § 1.2 (2000) (defining irrevocable licenses to be easements within the scope of property law).

<sup>93</sup> *See* 17 U.S.C. § 106 (2012); NIMMER & NIMMER, *supra* note 44, § 10.03[A][7].

<sup>94</sup> 17 U.S.C. § 101.

<sup>95</sup> 17 U.S.C. § 203.

<sup>96</sup> 17 U.S.C. § 205.

<sup>97</sup> *See supra* Part II.A.

<sup>98</sup> *See, e.g.*, MDY Indus., LLC v. Blizzard Entm’t, Inc., 629 F.3d 928, 939-40 (9th Cir. 2010) (as amended).

<sup>99</sup> 17 U.S.C. § 203.

<sup>100</sup> *See* 17 U.S.C. § 202; *see also* NIMMER & NIMMER, *supra* note 44, § 2.03[C]. Since most copies are movable, physical objects the law of chattels will generally control the ownership of copies; however, one can also get a copyright in an architectural works so real property law could also control in some cases. *See, e.g.*, McIntosh v. N. Cal. Universal Enters., 670 F. Supp. 2d 1069, 1098-99 (E.D. Cal. 2009)

fer of a copy of a copyrighted work does not transfer any right under copyright and the transfer of a copyright does not transfer ownership in the copies.<sup>101</sup> Since copies are defined as “any material objects . . . in which a work is fixed”<sup>102</sup> and § 202 clarifies that copyright law does not govern ownership of copies,<sup>103</sup> property law is the most natural place to look for law governing ownership of copies. Therefore, who is “the owner of a particular copy”<sup>104</sup> would not be a question within the scope of copyright law.

This distinction may be abstract, but it underlies the first sale doctrine. Section 109 itself gives rights to “the owner of a particular copy” separate from those of “the copyright owner.”<sup>105</sup> And the Court in *Kirtsaeng*, for instance, looked to both § 202 and the common law of chattels.<sup>106</sup> This application of the law of chattels is straightforward for physical books, and similar products, but the application of the law of chattels to digital goods is uncertain.<sup>107</sup> The Copyright Act’s requirement to separate copies and copyrights and define ownership of copies should be used by courts to clarify and strengthen the protection that digital property is given.<sup>108</sup>

#### E. *Tests Used by Circuit Courts to Determine Ownership*

The circuit courts are fractured on what test to use to determine whether a license agreement grants a license or in fact transfers ownership of a copy.<sup>109</sup> The two most prominent tests are the “incidents of ownership”

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(holding that the acquisition of a partially developed subdivision did not create a first sale bar to suit for the architectural plans for the subdivision). This comment will, for simplicity, assume that all copies are movable.

<sup>101</sup> 17 U.S.C. § 202.

<sup>102</sup> 17 U.S.C. § 101.

<sup>103</sup> 17 U.S.C. § 202.

<sup>104</sup> 17 U.S.C. § 109.

<sup>105</sup> 17 U.S.C. § 109.

<sup>106</sup> See *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1363, 1380 n.10 (2013).

<sup>107</sup> See Caitlin J. Akins, Comment, *Conversion of Digital Property: Protecting Consumers in the Age of Technology*, 23 LOY. CONSUMER L. REV. 215, 245-48 (2010) (discussing the application of the tort of conversion to digital property, using ebooks as an example).

<sup>108</sup> See 17 U.S.C. §§ 109, 202 (2012).

<sup>109</sup> For an overview of what tests have been used by circuit courts, see generally Brian W. Carver, *Why License Agreements Do Not Control Copy Ownership: First Sales and Essential Copies*, 25 BERKLEY TECH L.J. 1887, 1898-1925 (2010). Not all of the tests enumerated in that article are discussed here. For instance, the “Reservation of Title” or “magic words” approach, treating any license agreement that styles itself as a license or reserves title as a license instead of a sale, is not included here because it has been abandoned by the Ninth Circuit. See *Wall Data, Inc. v. L.A. Cnty. Sheriff’s Dep’t*, 447 F.3d 769, 785-86 (9th Cir. 2006) (describing *MAI Sys. Corp. v. Peak Computer, Inc.*, 991 F.2d 511 (9th Cir. 1993), as a severe restrictions case). However, if a reservation of title approach is used, the fact that ownership of copies should be governed by the law of chattels would imply that only a security interest, not the title itself, would be transferred in a jurisdiction where Article 2 of the Uniform Commercial Code applied. See U.C.C. § 2-401 (1977); *Synergetic Techs. v. IDB Mobile Commc’ns, Inc.*,

test from the Second Circuit<sup>110</sup> and the “significant restrictions” test from the Ninth Circuit.<sup>111</sup>

### 1. Significant Restrictions Test

The most straightforward statement of the significant restriction test is in *Vernor v. Autodesk, Inc.*: “a software user is a licensee rather than an owner of a copy where the copyright owner (1) specifies that the user is granted a license; (2) significantly restricts the user’s ability to transfer the software; and (3) imposes notable use restrictions.”<sup>112</sup> It is straightforward to draft a license agreement that meets these requirements and there is an incentive for copyright holders to do so.<sup>113</sup> Therefore, this test ends up treating most putative license agreements as transferring a license.<sup>114</sup>

For instance, in *Vernor* itself, a license was granted even though the use restrictions that the court pointed to likely covered little legal activity. The use restrictions included restrictions against using the software outside the Americas, modifying or translating the software (which an owner cannot generally do),<sup>115</sup> reverse engineering the software (which would likely necessitate the creation of copies of the code),<sup>116</sup> removing marks and notices (which may be independently illegal under § 1202),<sup>117</sup> and circumventing the digital rights management (DRM) system (which may be independently illegal under § 1201).<sup>118</sup> The agreement also allowed transfer only with the copyright holder’s written consent; however, the question in a first sale case

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871 F. Supp. 24, 29 (D.D.C. 1994) (applying U.C.C. § 2-401 to a reservation of title in a copyright license agreement). *But see* *ZilYen, Inc. v. Rubber Mfrs. Ass’n*, 935 F. Supp. 2d 211, 218-20 (D.D.C. 2013) (abrogating *Synergistic Techs.* in favor of the “incidents of ownership” approach).

<sup>110</sup> *Krause v. Titleserv, Inc.*, 402 F.3d 119, 124 (2d Cir. 2005).

<sup>111</sup> *Vernor v. Autodesk, Inc.*, 621 F.3d 1102, 1111 (9th Cir. 2010).

<sup>112</sup> *Id.*

<sup>113</sup> For a further discussion of the incentives facing a copyright holder see *supra* Part I.C.

<sup>114</sup> *Cf. Won*, *supra* note 7, at 405-08 (using *Vernor* as an example of how United States courts tend to uphold license agreements).

<sup>115</sup> Translations are derivative works, 17 U.S.C. § 101 (2012), and preparation of derivative works is the exclusive right of the copyright holder, 17 U.S.C. § 106(2). It is possible translation for use within the company would be a fair use, but presumptively it would be infringing. See 17 U.S.C. § 107.

<sup>116</sup> Even if the reverse engineering was fair use under *Sony Computer Entm’t v. Connectrix Corp.*, 203 F.3d 596, 599-600 (9th Cir. 2000), reverse engineering will include circumventing DRM in most cases which is very tightly controlled under 17 U.S.C. § 1201(f). See generally Craig Zieminski, *Game Over for Reverse Engineering?: How the DMCA and Contracts have Affected Innovation*, 13 J. TECH L. & POL’Y 298 (2008) (addressing current legal difficulties facing a reverse engineer).

<sup>117</sup> The notices and marks may be protected, for instance, by 17 U.S.C. § 1202, a provision of the DMCA.

<sup>118</sup> A “hardware copy-protection device,” *Vernor v. Autodesk, Inc.*, 621 F.3d 1102, 1104 (9th Cir. 2010), would likely be a “technological measure that effectively controls access to a work” as used in 17 U.S.C. § 1201(a).

is whether this type of provision is a nullity so it is circular to rely on it.<sup>119</sup> Therefore, there were few restrictions which would not have also been in place had there been a sale.

And this test does not differentiate fully between the areas covered by contract, copyright, and property law. The use restrictions were covenants and not part of the copyright license.<sup>120</sup> The restrictions on “the user’s ability to transfer”<sup>121</sup> were again contractual terms and the issue in a first sale case is whether the transfer restrictions are valid.<sup>122</sup>

The recent Ninth Circuit case of *MDY Industries v. Blizzard Entertainment*<sup>123</sup> is a mixed development in this line of jurisprudence. The case involved a violation of the World of Warcraft video game’s Terms of Use by using “Gliders”—software configured to control the in-game character.<sup>124</sup> The court still used the *Vernor* test, but properly applied Delaware law to determine whether the violation of the Terms of Use was a breach of a covenant or a condition of the license.<sup>125</sup> The court held that it was a covenant since potentially ambiguous terms should be read as covenants, not conditions. Further, the court held that a term cannot be a condition of the copyright license if it is outside of the scope of the exclusive rights of § 106.<sup>126</sup>

The requirement for a nexus between the violation and the exclusive rights under copyright law displays the court’s desire to only apply copyright infringement remedies to acts that look like violations of § 106, not simply using the program in an unintended way.<sup>127</sup> And this firmer line between copyright and contract is a progress; however, it is unclear from the opinion if the court was applying a rule such as excusing a condition where it is not “a material part of the agreed exchange,”<sup>128</sup> or if it is a free standing rule about copyright licenses. If it is the latter, then the court is using copyright law to further invade the proper sphere of contract law in order to address an unfair effect of the *Vernor* test.

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<sup>119</sup> *Vernor*, 621 F.3d at 1111-12; *c.f.* *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1356, 1371 (2013) (holding that a notice that a book cannot be exported is a nullity).

<sup>120</sup> The restrictions would likely not even be conditions of the license since the use restrictions were introduced with the phrase “YOU MAY NOT” and not “YOUR LICENSE IS CONDITIONED ON.” *Vernor*, 621 F.3d at 1104. This would make breach of these terms the breach of a covenant and not the breach of a condition of the license since courts will only hold a term to be a condition if it is clearly stated. *See* *Effects Assocs. v. Cohen*, 908 F.2d 555, 559 n.7 (9th Cir. 1990).

<sup>121</sup> *Vernor*, 621 F.3d at 1111.

<sup>122</sup> *C.f.* *Kirtsaeng*, 133 S. Ct. at 1356, 1371 (holding that a notice that a book cannot be exported is a nullity).

<sup>123</sup> *MDY Indus., LLC v. Blizzard Entm’t, Inc.*, 629 F.3d 928 (9th Cir. 2010) (as amended).

<sup>124</sup> *Id.* at 934-35.

<sup>125</sup> *Id.* at 939-40.

<sup>126</sup> *Id.*

<sup>127</sup> *See Id.* at 940-42.

<sup>128</sup> RESTATEMENT (SECOND) CONTRACTS § 229 (1981).

## 2. Incidents of Ownership Test

Under the incidents of ownership test, ownership of a copy is transferred when the putative license agreement gives enough of the rights typical of ownership in chattels—such as the right of alienation and unrestricted use—to the transferee.<sup>129</sup> For instance, in *Krause v. Titleserv, Inc.*, the right to indefinitely possess the copy along with the right to destroy the copy gave the possessor ownership of the copy.<sup>130</sup> While in *DSC Communications v. Pulse Communications*, which also applied the incidents of ownership test, the agreement transferred a perpetual right to possession of a copy for a single payment but was held not to be a transfer of ownership because the contract contained a nondisclosure agreement restricting the right to disclose or transfer the software.<sup>131</sup>

This test is more solicitous of the difference between ownership of copyright and ownership of copies.<sup>132</sup> However, it conflates contractual restrictions with transfer of ownership; a transfer of ownership of a chattel can still be valid even though it contains other terms.

### III. CHOICE OF LAW IN DETERMINING OWNERSHIP

Under the tests commonly used by federal courts to determine whether a license agreement transfers ownership,<sup>133</sup> courts are quite likely to hold that any given transaction that is styled as a license is a license.<sup>134</sup> However, some foreign jurisdictions, such as the European Union, would treat some of those same transactions as sales.<sup>135</sup> Therefore, it can make a substantive difference whether United States or foreign law governs who is the owner of a copy.

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<sup>129</sup> See *Krause v. Titleserv, Inc.*, 402 F.3d 119, 123-24 (2d Cir. 2005).

<sup>130</sup> *Id.* at 123-25.

<sup>131</sup> *DSC Comc'ns v. Pulse Comc'ns*, 170 F.3d 1354 (Fed. Cir. 1999). In *DSC*, the court says that it looked for whether there were “severe restrictions,” so one could view *DSC* as a significant restrictions case. *Id.* at 1360-61. For a further development of that argument, see *Vernor v. Autodesk, Inc.*, 621 F.3d 1102, 1113 (9th Cir. 2010). *Krause*, however, builds off of *DSC* assuming it is an incidents of ownership case. *Krause*, 402 F.3d at 123.

<sup>132</sup> See *DSC*, 170 F.3d at 1360 (“[A] party who purchases copies of software from the copyright owner can hold a license under a copyright while still being an “owner” of a copy of the copyrighted software.”).

<sup>133</sup> See *supra* Part II.C.

<sup>134</sup> *C.f.* *Won*, *supra* note 7, at 405-08 (using *Vernor* as an example of how United States courts tend to uphold license agreements).

<sup>135</sup> *Id.* at 392-95 (discussing the effect of *UsedSoft*, Case C-128/11, *UsedSoft GmbH v. Oracle Int'l Corp.*, 2012 E.C.R. I-00000, which held that the European copyright was exhausted after a transaction that likely would have been a license under the *Vernor* test).

Federal courts have created uniform federal rules, displacing state or other local law, on the ownership of copies.<sup>136</sup> Courts tend to be willing to look to local law to interpret whether a violation of a license agreement is a breach of contract or a copyright infringement, but not to determine whether a given agreement is a license or a sale.<sup>137</sup> In striving for uniformity, the traditional means to determine ownership of chattels, such as title, have been rejected because they typically turn on state or other local law.<sup>138</sup> The statute, however, differentiates between ownership of copies and copyrights and only preempts laws within the scope of § 106 or analogous to those rights.<sup>139</sup>

If first sales could only be domestic it may be possible to create a uniform rule for ownership since the differences in state property laws are minor in comparison to international differences.<sup>140</sup> However, especially post-*Kirtsaeng*, a federal court could be asked to determine the ownership of a copy under a contract governed by the law of any country on Earth.<sup>141</sup> Additionally, even if a uniform rule was practical, there will still be a need to formulate a choice of law rule to interpret the contract in order to determine whether there are sufficient incidents of ownership or significant restrictions.<sup>142</sup>

When the issue of whose law governs the ownership of a given copy is confronted directly, both modern and traditional choice of law rules point not to federal law, but the law of the place of delivery. This rule, like the Supreme Court's reading of "lawfully made under this title," has the benefit of treating copies like any other article of commerce and allowing normal, beneficial trade.<sup>143</sup>

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<sup>136</sup> See *supra* Part II.E.

<sup>137</sup> See *MDY Indus., LLC v. Blizzard Entm't, Inc.*, 629 F.3d 928, 938-41 (9th Cir. 2010) (as amended) (using federal law to determine copy ownership under the *Vernor* test and state law to analyze the covenant or condition issue).

<sup>138</sup> See, e.g., *Krause v. Titleserv, Inc.*, 402 F.3d 119, 123 (2d Cir. 2005) ("The same transaction might be deemed a sale under one state's law and a lease under another's. . . . Such a result would contradict the Copyright Act's 'express objective of creating national, uniform copyright law by broadly preempting state statutory and common-law copyright regulation.'" (quoting *Comty. for Creative Non-violence v. Reid*, 490 U.S. 730, 740 (1989)) (citing 17 U.S.C. § 301 (a) (2000))).

<sup>139</sup> See 17 U.S.C. § 202.

<sup>140</sup> All states except Louisiana have adopted at least part of UCC Article 2 on sale of goods, so there is a measure of uniformity in what would be a sale in the United States that does not exist internationally. See *Uniform Commercial Code Locator*, LEGAL INFO. INST., <http://www.law.cornell.edu/uniform/ucc.html> (last visited Oct. 18, 2013).

<sup>141</sup> See *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1355-56 (2013).

<sup>142</sup> The first sale in *Kirtsaeng* occurred in Thailand. *Id.* at 1356.

<sup>143</sup> See *supra* Part I.B.

A. *Choice of Law Rules Applied by Federal Courts*

Federal choice of law rules apply in federal question cases, such as copyright infringement.<sup>144</sup> However, that does not mean that federal law will provide all sources of law in a federal question case.<sup>145</sup> Federal courts in federal question cases, such as copyright cases, often use the *Restatement (Second) Conflict of Laws* to guide their conflicts of laws analysis unless there is an implicit or explicit choice of law rule in the statute.<sup>146</sup> While the *Restatement (Second)* is often vague,<sup>147</sup> it is frequently read as parallel to traditional choice of law rules, as exemplified in the *Restatement (First) Conflict of Laws*.<sup>148</sup>

Federal courts will generally use the choice of law rules of the state in which they sit for the determination of state law.<sup>149</sup> It is beyond the scope of this comment to investigate every state choice of law regime. Therefore, this comment will instead examine choice of law issues under the principals articulated in the two restatements.<sup>150</sup>

B. *Choice of Law for the Portions of a License Agreement Governed by Contract*

Absent a clear choice of law clause in the agreement, the *Restatement (Second)* looks to

- (a) the place of contracting,
- (b) the place of negotiation of the contract,
- (c) the place of performance,
- (d) the location of the subject matter of the contract, and

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<sup>144</sup> 15 C.J.S. *Conflict of Laws* § 33 (2013).

<sup>145</sup> See *Maternally Yours v. Your Maternity Shop*, 234 F.2d 538, 540 (2d Cir. 1956) (“[state law governs] whatever the ground for federal jurisdiction, to any issue or claim which has its source in state law.”).

<sup>146</sup> See *Nat’l Fair Housing Alliance, Inc. v. Prudential Ins.*, 208 F. Supp. 2d 46, 62 (D.D.C. 2002). *But see Sosa v. Alvarez-Machain*, 542 U.S. 692, 709-12 (2004) (declining to apply a Restatement rule because it was in conflict with a statutory provision).

<sup>147</sup> See, e.g., RESTATEMENT (SECOND) CONFLICT OF LAWS § 6 (1971).

<sup>148</sup> See *Sosa*, 542 U.S. at 709-10.

<sup>149</sup> *C.f. Klaxon Co. v. Stentor Elec. Mfg. Co.*, 313 U.S. 487, 496-97 (1941).

<sup>150</sup> For a more general background on choice of law in copyright, especially ownership of copyrights as opposed to copies, see generally Paul Edward Geller, *Conflicts of Laws in Copyright Cases: Infringement and Ownership Issues*, 51 J. COPYRIGHT SOC’Y U.S.A. 315 (2004).

(e) the domicile, residence, nationality, place of incorporation and place of business of the parties<sup>151</sup>

to determine which jurisdiction has the strongest connection to the transaction.<sup>152</sup> In general, the outcome of a balancing test with this many factors is difficult to predict. However, it includes a more certain a default rule: “[i]f the place of negotiating the contract and the place of performance are in the same state, the local law of this state will usually be applied.”<sup>153</sup>

Therefore, at least when interpreting an agreement that is entirely within one jurisdiction—an agreement between two citizens of that jurisdiction, negotiated and executed there—the law of that jurisdiction will generally apply.<sup>154</sup> There is a yet more specific provision, stating that contracts to sell interests in chattels are governed by the law of the place of delivery.<sup>155</sup> However, one would have to assume that an interest in a chattel, instead of a copyright license, is conveyed in order to apply that test, which cannot be done when the status of a transaction as a sale or license contested.

Under traditional rules, a formal contract, such as a written license agreement, would be interpreted under the law of the place from which the acceptance is sent.<sup>156</sup> Under a typical pattern of offer for sale followed by acceptance by the buyer, the law of the buyer’s jurisdiction will apply.

Therefore, the traditional rule and the modern rule will generally come to the same result. If both parties are from the same jurisdiction, then acceptance will likely be sent from inside that jurisdiction. If the parties are from different jurisdictions, then the places of negotiation, performance, and domicile will likely also be split. Negotiation will be split because a license for a digital copy will likely be negotiated over the Internet, not in the home jurisdiction of one party. Performance will likely consist of a transfer of money one way and a copy the other, with some part of the performance being made in from each jurisdiction. And domicile is split by assumption. However, most consumer copyright licenses will be accepted and executed by the customer in their home jurisdiction and the subject matter of the contract would be the licensed or sold copy, which will generally be in the possession of the customer.<sup>157</sup> Therefore, those factors which

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<sup>151</sup> RESTATEMENT (SECOND) CONFLICT OF LAWS § 188(2) (1971).

<sup>152</sup> *See id.* §§ 186-88.

<sup>153</sup> *Id.* § 188.

<sup>154</sup> *Id.* §§ 186-88.

<sup>155</sup> *Id.* § 191.

<sup>156</sup> *Id.* RESTATEMENT (FIRST) CONFLICT OF LAWS § 326 (1934).

<sup>157</sup> One could instead say that the subject matter of the license agreement is the intellectual property located—to the extent that term has meaning in this context—in the copyright holder’s jurisdiction or the jurisdiction where the copyright is registered. Since the location of a copyright is not fixed and a license agreement of this type will generally include a permission for the licensee to use a given copy, the location of that copy is a more natural location for the subject matter of the contract.

are not split between the jurisdictions in a typical case will likely favor the same jurisdiction as the traditional rule: the jurisdiction of the customer.

Federal courts have used similar reasoning to determine which states law applies when there is a breach of an agreed term of a license agreement, but it is generally not used to determine ownership.<sup>158</sup> Under both the traditional and the modern approaches to conflict of law, the law of the customer's jurisdiction will likely govern questions of contract law in license agreements.

C. *Choice of Law for the Portions of a License Agreement Governed by Copyright*

A copyright is within the definition of “property” in the second *Restatement*; however, the property-related provisions are not applicable since the choice of law issue is settled by statute for the exclusive rights in § 106, and all analogous rights.<sup>159</sup> Section 301 of the Copyright Act provides that “all legal or equitable rights that are equivalent to any of the exclusive rights within the general scope of copyright as specified by section 106 . . . are governed exclusively by this title.”<sup>160</sup> This settles the question of what law governs the grant of a copyright license itself.

Since the common law choice of law rules are displaced by statute, the same result would be reached by modern and traditional approaches. However, the validity of the grant of a license should not generally be the issue when determining ownership of a copy since ownership of a copy is separate from ownership of the copyright.<sup>161</sup>

D. *Choice of Law for the Portions of a License Agreement Governed by Property*

To determine who the owner of a copy is, it is more important—and more difficult—to properly choose the applicable property law than the applicable contract law and copyright law. This is because it is ownership of the chattel comprising the copy that determines ownership of the copy.<sup>162</sup>

The traditional rule is easy to apply: “the law of the state where the chattel is at the time of the conveyance”<sup>163</sup> controls the basic questions

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<sup>158</sup> See, e.g., *MDY Indus., LLC v. Blizzard Entm't, Inc.*, 629 F.3d 928, 938-41 (9th Cir. 2010).

<sup>159</sup> 17 U.S.C. § 302 (2012); RESTATEMENT (SECOND) CONFLICT OF LAWS ch. 9 intro. note (1971); see *id.* at ch. 9 (addressing choice of law in property).

<sup>160</sup> 17 U.S.C. § 302 (2012).

<sup>161</sup> 17 U.S.C. § 202 (2012).

<sup>162</sup> See 17 U.S.C. §§ 109, 122 (2012).

<sup>163</sup> This language appears verbatim in sections 255-57 of the RESTATEMENT (FIRST) CONFLICT OF LAW (1934).

about the validity of a transfer of a chattel.<sup>164</sup> And movement of a chattel across jurisdictional boundaries does not affect ownership.<sup>165</sup> Therefore under the *Restatement (First)*, the law of the place where the chattel is at the time of the conveyance controls.

Under the *Restatement (Second)*, the validity of a conveyance of a chattel is typically analyzed under the law of the state in which the chattels were located at the time of the conveyance.<sup>166</sup> And the ownership of the chattel is not changed by moving it to another jurisdiction.<sup>167</sup> Therefore, absent some other principle, the ownership of a copy of a copyrighted work should be analyzed under the law of the jurisdiction where the copy was conveyed.<sup>168</sup>

However, most sections of the *Restatement (Second)*, including the provision governing the validity of conveyances of chattels, leave open an escape hatch to general—and open ended—choice of law principles.<sup>169</sup> These include:

- (a) the needs of the interstate and international systems,
- (b) the relevant policies of the forum,
- (c) the relevant policies of other interested states and the relative interests of those states in the determination of the particular issue,
- (d) the protection of justified expectations,
- (e) the basic policies underlying the particular field of law,
- (f) certainty, predictability and uniformity of result, and
- (g) ease in the determination and application of the law to be applied.<sup>170</sup>

On “the needs of the interstate and international system,”<sup>171</sup> the Supreme Court in *Kirtsaeng* did not find a global view of first sale in tension with any treaty.<sup>172</sup> Many courts have emphasized the need for a uniform

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<sup>164</sup> See *id.* §§ 255-57.

<sup>165</sup> See *id.* § 260.

<sup>166</sup> RESTATEMENT (SECOND) CONFLICT OF LAWS § 244 (1971).

<sup>167</sup> *Id.* § 247.

<sup>168</sup> See *id.* § 244.

<sup>169</sup> The general principals are in RESTATEMENT (SECOND) CONFLICT OF LAWS § 6. While, for instance, § 188 and § 244 have such escape hatches. The detailed analysis below was not done for those sections because it is property law that in the end determines ownership of copies.

<sup>170</sup> *Id.* § 6.

<sup>171</sup> *Id.* § 6(2)(a).

<sup>172</sup> See *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1369-70 (2013) (discussing how a non-geographic reading of “lawfully made under this title, 17 U.S.C. § 109 (2012), is in harmony with the definition of “treaty party,” § 101, and the rights given to treaty parties in § 104 (a)-(b)).

rule in the interstate system.<sup>173</sup> But the international system, which post-*Kirtsaeng* must be addressed, will be difficult to fold into a uniform rule. And the international trade encouraged by *Kirtsaeng* would be significantly hampered if one cannot use the law of the exporting nation to establish title to imported goods.

To find the policies of the United States and the basic policies of copyright, one can look to the Copyright Act and court decisions interpreting it. Therefore, for both factors (b) and (e) one can look to the Copyright Act and its interpretations.<sup>174</sup> There is a statutory policy in favor of differentiating between ownership of copies and ownership of copyrights.<sup>175</sup> The United States also has a policy against restraints on alienation of chattels and in favor of open international trade.<sup>176</sup>

Behind all of those policies is the copyright policy contained in the Constitution: “To promote the Progress of Science.”<sup>177</sup> And further protections for copyright holders will incentivize them to make new works and “promote the Progress of Science.”<sup>178</sup> However, open distribution of these works also enlightens the populace since those works could then reach a larger audience.<sup>179</sup> Because it is difficult for a court to determine if more openness or more protection would better serve the “Progress of Science” and the Constitution gives Congress power over copyrights, courts will generally defer to the balance the Congress has struck.<sup>180</sup> Therefore, it is unlikely that a court would venture to weigh this policy for or against the use of any particular jurisdiction’s law.

While the policies of the jurisdiction of conveyance may be varied,<sup>181</sup> it is unlikely that many would object to the application of their law. Therefore, for factor (c),<sup>182</sup> if a United States court chooses—for its own purposes—to apply local instead of forum law, it will be unlikely to denigrate the

<sup>173</sup> *Krause v. Titleserv, Inc.*, 402 F.3d 119, 123 (2d Cir. 2005). The *Krause* court did not limit itself to the borders of the United States, but it was addressing an international case.

<sup>174</sup> See RESTATEMENT (SECOND) CONFLICT OF LAWS § 6(2)(b), (e) (1971).

<sup>175</sup> See 17 U.S.C. § 202 (2012).

<sup>176</sup> See *Kirtsaeng*, 133 S. Ct. at 1363, 1371.

<sup>177</sup> U.S. CONST. art. I, § 8, cl. 8. Some contend that copyrights promote the “useful Arts” instead of “Science.” *Id.*; NIMMER & NIMMER, *supra* note 44, § 1.03 n.11.2 (2013). However, two pieces of evidence point to “Science” as the object of copyright. First, archaic usages of the term “Science” which encompass knowledge generally instead of only knowledge gained from falsifiable hypotheses and empirical testing. *Id.* Second, the clause mentions “Science” then “useful Arts,” followed by “Authors” then “Inventors” and “Writings” then “Discoveries.” U.S. CONST. art. I, § 8, cl. 8. It is most natural to group together the first word in each pairing, meaning that the Constitution promotes “Science” by protecting “Authors” in their “Writings.” NIMMER & NIMMER, *supra* note 44, § 1.03 n.11.2 (2013).

<sup>178</sup> U.S. Const. art. I, § 8, cl. 8; see also *Eldred v. Ashcroft*, 537 U.S. 186, 214-15 (2003).

<sup>179</sup> See *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1363, 1364-67 (2013).

<sup>180</sup> See *Eldred*, 537 U.S. at 212-13.

<sup>181</sup> Since it can be any jurisdiction on Earth. *Kirtsaeng*, 133 S. Ct. 1351, 1367-69 (discussing dicta from *Quality King Distribs., Inc. v. L’anza Research Int’l, Inc.*, 523 U.S. 135 (1998)).

<sup>182</sup> See RESTATEMENT (SECOND) CONFLICT OF LAWS § 6(2)(c) (1971).

policies or interests of that jurisdiction. It could, however, go sharply against the policies of the foreign jurisdiction to rule that a holder of title under that jurisdiction's law did not have enough of the "incidents of ownership" to make him or her an owner under United States law.

There are two parties who will have justified expectations that a court should consider:<sup>183</sup> the copyright holder and the owner of a copy under the law of a foreign jurisdiction. The *Kirtsaeng* case could be read to support the expectations of either of these parties. A copyright owner could read application of United States copyright law to foreign manufacturers by the holding that "lawfully made under this title" means effectively would have complied with the Copyright Act if it had applied.<sup>184</sup> This holding applies United States copyright law as a uniform rule governing foreign conduct.<sup>185</sup> But this holding is based on the peculiar language of "lawfully made under this title."<sup>186</sup> The phrase "under this title" demands the application of Title 17 of the U.S. Code and does not provide territorial limits.<sup>187</sup> While the phrase "owner of a particular copy" concerns the ownership of an object—a traditional realm of local law—and does not demand that "this title" be applied.<sup>188</sup> A person who owns a copy under foreign law also had his or her justified expectations—that he or she will be able to alienate the copy—bolstered by *Kirtsaeng*.<sup>189</sup> And the inclusion in *Kirtsaeng* that traditional rules on restraints on the alienation of chattels informs § 109 would further support a foreign owner's expectation that traditional property rules apply to copies of copyrighted works.<sup>190</sup>

A rule determining ownership under a federal rule may appear more uniform, predictable, and certain, and may also seem like it would be easier to determine and apply.<sup>191</sup> However, the federal rules in common use look to rights and responsibilities under the license agreement.<sup>192</sup> One must still look to foreign contract law to determine if there are significant restrictions imposed by the license or if sufficient incidents of ownership are transferred.<sup>193</sup> These inquiries would likely be at least as difficult as simply determining whether, under local law, ownership was transferred. Likewise, if the same license agreement is executed in two different foreign jurisdic-

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<sup>183</sup> See *id.* § 6(2)(d).

<sup>184</sup> *Kirtsaeng*, 133 S. Ct. at 1358-60.

<sup>185</sup> *Id.*

<sup>186</sup> See 17 U.S.C. § 109 (2012); *Kirtsaeng*, 133 S. Ct. at 1358-60.

<sup>187</sup> See 17 U.S.C. § 109 (2012); *Kirtsaeng*, 133 S. Ct. at 1358-60.

<sup>188</sup> See 17 U.S.C. § 109 (2012).

<sup>189</sup> See *Kirtsaeng*, 133 S. Ct. at 1356 (holding sales which occurred in Thailand under Thai law to be within 17 U.S.C. § 109).

<sup>190</sup> See *id.* at 1363.

<sup>191</sup> See RESTATEMENT (SECOND) CONFLICT OF LAWS § 6(2)(f)-(g) (1971); see also *Krause v. Titleserv, Inc.*, 402 F.3d 119, 123 (2d Cir. 2005).

<sup>192</sup> See *supra* Part II.E.

<sup>193</sup> See *Vernor v. Autodesk, Inc.*, 621 F.3d 1102, 1111 (9th Cir. 2010); *Krause*, 402 F.3d at 123-24.

tions it may have a different result since the same document could be held to have greater or lesser restrictions or transfer different incidents of ownership.<sup>194</sup> This disrupts the apparent certainty and uniformity of a federal rule.<sup>195</sup> If one uses local property law then it will be certain, predictable, and straightforward to determine whose law applies without much cost on uniformity or ease of application. Courts will need to look into local law under any rule; the difficulty and uncertainty involved in deciding an issue of another jurisdiction's law will be of similar magnitudes in either regime.

This does not imply that actually determining and applying foreign law will be easy or uniform. However, it will be even more difficult to try to determine both the content of a foreign contract and, for example in the incidents of ownership test, how analogous the rights granted in that contract are to traditional United States property law. Adding an extra layer of federal law on an already difficult question will not make it easier.

Therefore, under either the more nebulous modern choice of law standards or the traditional standards, the law of the place of performance of the agreement would be the appropriate law to apply when examining the property law provisions of a license agreement or sale of a digital copy of a copyrighted work.

## CONCLUSION

Confusion about the scope of contract, copyright, and property law affects what law courts apply when deciding who owns a copy of a copyrighted work. The resultant confusion about whose law controls the ownership of copies leads to courts denying rightful owners the protections of the Copyright Act. The first sale doctrine and the protections given to software owners to use and repair their software provide the statutory structure for open markets in copyrighted works and the interaction between copyright and digital technology respectively. Misunderstanding abstract ideas such as the scope of property law in license agreements can disrupt the ability to resell and use any piece of digital technology—cars and microwaves, in addition to smartphone apps and digital movies.<sup>196</sup>

Therefore, it is necessary to properly separate copyright law—which controls the exclusive rights in § 106, property law—which controls the ownership of the copy itself, and contract law—which controls all the terms in a license agreement which are not grants of licenses to do something otherwise forbidden by § 106 or grants of property interests in the copies themselves. Once those issues are properly divided, the choice of law ques-

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<sup>194</sup> See *Vernor*, 621 F.3d at 1111; *Krause*, 402 F.3d at 123-24.

<sup>195</sup> This is exactly the result that *Krause*, 402 F.3d at 123, attempted to avoid.

<sup>196</sup> See 17 U.S.C. §§ 109, 117 (2012); *Kirtsaeng v. John Wiley & Sons*, 133 S. Ct. 1351, 1635 (2013); *MAI Sys. v. Peak Computer*, 991 F.2d 511, 519 (9th Cir. 1993).

tions are much more manageable, even under the indeterminate standards of modern conflict of laws systems.<sup>197</sup> This choice of law analysis leads to the reasonable conclusion that if a person pays for a good anywhere, and the local law deems it a sale, then copyright law should not stop that person from using or reselling it.

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<sup>197</sup> See RESTATEMENT (SECOND) CONFLICT OF LAWS § 6 (1971).