

## Ostrom's Law: Property Rights in the Commons

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**Abstract:** Elinor Ostrom's work has immeasurably enhanced legal scholars' understanding of property. Although the richness of these contributions cannot be distilled into a single thesis, their flavor can be captured in a maxim I call Ostrom's Law: *A resource arrangement that works in practice can work in theory*. Ostrom's scholarship challenges the conventional wisdom by examining how people interact over resources on the ground – an approach that enables her to identify recurring institutional features associated with long-term success. In this essay, I trace some of the ways that Ostrom's focus on situated examples has advanced interdisciplinary dialogue about property as a legal institution and as a human invention for solving practical problems. I begin by highlighting the attention to detail that characterizes Ostrom's methodology. I then examine how Ostrom's scholarship yields insights for, and employs insights from, property theory. Next, I consider the question of scale, an important focal point of Ostrom's work, and one that carries profound implications for law. I conclude with some observations about interdisciplinarity as it relates to research on the commons.

**Keywords:** anticcommons, commons, interdisciplinarity, models, scale, semicommons

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### I. Introduction

It is nearly impossible to overstate the significance of Elinor Ostrom's work for legal thinkers working on property rights and resource dilemmas. To date, *Governing the Commons* (1990) has been referenced in at least 469 law review

articles,<sup>1</sup> easily making it one of the most-cited property-related works published in the last 20 years. Ostrom's scholarship has figured in the work of many of the most influential property scholars in legal academia (see Rose, this issue). My own teaching and writing have benefited enormously from Ostrom's findings and insights, and I continue to learn more on each rereading.

Although it would be foolhardy to try to distill Ostrom's lessons for legal scholars into a single thesis, one starting point is what I will call "Ostrom's Law": *A resource arrangement that works in practice can work in theory.*<sup>2</sup> The trick, of course, is in finding the right theory, or set of theories. As Ostrom explains: "Theoretical inquiry involves a search for regularities. It involves abstraction from the complexity of a field setting, followed by the positing of theoretical variables that underlie observed complexities" (Ostrom 1990, p. 24; see also *ibid.*, pp. 45–46). Only then does it become possible to assess which institutional models can work in which contexts, and to thereby dodge both misguided efforts at transplantation and missed opportunities to tap into transferable lessons.

This essay traces some of the ways that Ostrom's focus on situated examples has advanced the interdisciplinary dialogue about property, both as a legal institution and as a human invention for solving practical problems. I start by briefly highlighting some virtues of attentiveness that Ostrom's work embodies and emphasizes. I then examine how Ostrom's work on the commons has yielded insights for, and harvested insights from, theoretical work on the nature and meaning of property. Next, I turn to the issue of scale, a recurring theme in Ostrom's work, and one that carries enormous implications for law. I conclude with some observations about how work on the commons both depends upon and informs interdisciplinarity.

## 2. Paying attention in the commons

Ostrom's work illustrates how attention to contextual and design details, to the use of language, and to the fit of models can pay dividends in thinking about the management of common pool resources. Indeed, the Institutional Analysis and Development framework (see, e.g. Ostrom 1998; 2005) functions as an elegant machine for channeling scholarly attention in meaningful analytic directions and synthesizing the results (see Ostrom 2007, pp. 25–27).

### 2.1. Details matter

Ostrom's methodology, which she aptly describes as "moving back and forth from the world of theory to the world of action" (1990, p. 45) builds in a high degree

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<sup>1</sup> Based on a search conducted July 29, 2010 in Westlaw's journal and law review (JLR) database.

<sup>2</sup> Although this resembles the punchline of an old academic joke, the point is a serious one (see, e.g. Lane 2006).

of sensitivity to contextual and institutional details that may impact the feasibility and sustainability of resource arrangements. Indeed, “congruence between appropriation and provision rules and local conditions” is one of the design principles of enduring common-pool resource (CPR) institutions that Ostrom has identified (1990, p. 92). Revisiting this principle in light of nearly two intervening decades of research, she flagged three subcategories: “congruence with the local ecology,” “congruence with the local culture,” and “congruence between benefits and costs” (Ostrom 2009a, p. 40). The ideas are intuitive, but some examples will help to illustrate.

Some of the governance approaches Ostrom studied, such as rotational irrigation systems or the fishing-site allocation method developed in Alanya, Turkey, rely on temporal turn-taking. Such rotations can produce a built-in monitoring effect by bringing the incoming and outgoing claimants in direct visual contact with each other (Ostrom 1990, pp. 95–96, 204–205). The former will wish to arrive early so as to not miss any increment of appropriation time, while the latter will wish to stay until the very end of her turn; as a result, each will watch that the other does not overstep the bounds (*ibid.*). Yet the success of this approach depends to some extent on cultural factors, such as the existence of shared norms and reputational stakes, the expectation of repeat play, and the absence of marked divisions among members of the community sharing the resource (see, e.g. *ibid.*, pp. 88–89; see also Ellickson 1991). It is easy to understand how the proximity of interested parties could work to leverage compliance, but equally easy to imagine how, under different conditions, the same proximity might heighten the chances of provocation and conflict. Cultural congruence also holds relevance for substantive choices about entitlements. For example, we might examine how the American tendency to equate “property” with “private property” (see McCay 1996, p. 122), factors into the acceptability of different institutional arrangements.<sup>3</sup>

Ecological context is similarly important, a point that relates closely to the theme of scale developed in more depth below (see section 4). Determining how broadly or narrowly to define a resource system or a set of spillovers can be challenging [see, e.g. Ostrom 1990, p. 128–130 (recounting boundary questions that emerged in the context of two interdependent groundwater basins); Nowak et al. 1994, pp. 270–272 (noting problems presented by spillovers like smoke that have diminishing effects across space); Geores 2003, pp. 80–83 (discussing scale and resource definition issues presented by forests)]. Yet institutional success depends upon drawing boundaries in a manner that achieves a workable degree of internalization. “Nesting” different levels of governance may be necessary to achieve internalization where complex systems produce spillovers at multiple scales (see, e.g. Ostrom 1990, pp. 101–102). Other resource-specific details matter as well. For example, harvesting patterns, which influence the immediacy

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<sup>3</sup> In a similar vein, Kahan and Braman (2006) have examined how “cultural cognition” can explain policy disagreements as well as how consensus might build around an instrument like tradable emissions permits (*ibid.*, 169).

of feedback that participants receive about their collective appropriation choices, vary by resource: milking is a daily occurrence, while meat production takes much longer (Ostrom 1990, p. 208). These timing issues, which implicate the ability to apply and enforce certain kinds of rules, may be as important as weather patterns, terrain variations, and the interaction among habitats to the success of particular arrangements.

The notion that details matter reemerges in the burgeoning field of behavioral law and economics, which holds many lessons for the commons. For example, as Ostrom has long recognized, the prospects for institutional change may be sensitive to whether a change is perceived as a loss, given the human tendency to weight losses more heavily than foregone gains of equal magnitude (1990, pp. 208–209, citing Kahneman and Tversky 1979; Hardin 1982). The prospect of using the growing body of knowledge about human cognition to improve commons governance is an exciting one – and one that depends upon attention to detail. As Thaler and Sunstein note, “small and apparently insignificant details can have major impacts on people’s behavior. A good rule of thumb is to assume that ‘everything matters’” (2008, p. 3). Experimental work can help to isolate the significance of particular factors in improving the prospects for cooperation. For example, Ostrom observes that “[m]aking one simple change in the design of a laboratory experiment, allowing participants to engage in face-to-face communication (cheap talk), enables them to reduce overharvesting substantially” (2009b, p. 208, citing Ostrom and Walker 1991).

## **2.2. Language matters**

A precise vocabulary is an important prerequisite to thoughtfully assessing and addressing commons situations. Ostrom has emphasized three distinctions that are especially important for legal scholars interested in understanding situations and crafting workable alternatives: the distinction between open-access regimes and common property, the distinction between the common-pool resource itself and the property regime that governs it, and the distinction between resource systems and resource units (1999, pp. 335–338).

### **2.2.1. Open access vs. the commons**

When Hardin (1968, p. 1244) asked his readers to “[p]icture a pasture open to all,” he was referencing an ungoverned open-access regime from which nobody could be excluded. Yet by calling the resulting collective action problem “the tragedy of the commons,” the notion of common property became conflated with the lawless (or law-free) condition of open access. The distinction between open-access and common property was made decades ago by Ciriacy-Wantrup and Bishop (1975) and has been reiterated by Ostrom (e.g. 1999, pp. 335–336; see also Schlager and Ostrom 1992) and others (e.g. McCay 1996, p. 113; Dagan and Heller 2001, pp. 556–557; Eggertsson 2003, pp. 75–76). Yet confusion on this point has yet to be fully eradicated. Recognizing that nearly all “private” property is actually

owned (or at least used) by groups, such as households or firms, offers one way around this blind spot. These everyday examples of non-tragic commons lead us to ask not whether common property is feasible at all, but rather under what circumstances and at what scale.

### **2.2.2. Resource attributes vs. property regimes**

Also crucial for legal scholars is the distinction between resources and the legal regimes that govern them, even though the two interact. For example, the attributes of resources that make them a “common pool” – difficult exclusion and rival resource units – do not dictate any particular governance solution (e.g. Ostrom 1999, pp. 337–338). Those attributes can mutate depending on technological advancements and human interventions,<sup>4</sup> but at some level they represent facts about the world (Ostrom 2007, pp. 39–42). Property rights, in contrast, are matters of human construction (e.g. McCay 1996, p. 113). Although the attributes of the resource in question will influence how property rights develop – we cannot simply parcelize an ocean (see, e.g. McKean 1996, p. 228) – the fact that resources and regimes are conceptually distinct usefully clarifies the policy task.

### **2.2.3. Resource systems vs. resource units**

In thinking and writing about resource dilemmas and the property rights associated with them, it is also imperative “to distinguish between the *resource system* and the flow of *resource units* produced by the system” (Ostrom 1990, p. 30). Although each of these facets of common-pool resources must be governed in some fashion (see Ostrom and Schlager 1996, p. 130), they may operate under different governance protocols. The distinction is therefore essential for descriptive clarity (if we say water is inalienable, for example, we need to know whether we are referring to the stock, the flow, or both). But the distinction is also important because it represents a “seam” of sorts in the common-pool resource that will often mark a change in property rights or ownership arrangements. As developed below (see section 3.2), the resulting abutment of property arrangements can produce incentive misalignments that require attention (see Alchian and Demsetz 1973, pp. 22–24).

## **2.3. Models matter**

A third variety of attentiveness is necessary to guard against the undue influence of dichotomies, absolutes, and other forms of rigid classification. In the first chapter of *Governing the Commons*, Ostrom (1990, p. 24) notes the pernicious influence of categorical thinking in another context: “[t]he conviction that all physical structures could be described in terms of a set of perfect forms – circles,

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<sup>4</sup> For example, the development of barbed wire made exclusion (and, conversely, confinement) easier, changing the calculus for the definition and enforcement of private property rights in livestock (Anderson and Hill 1998, p. 129).

squares, and triangles – limited the development of astronomy until Johannes Kepler broke the bonds of classical thought and discovered that the orbit of Mars was elliptical.” That commons scholars were making essentially the same mistake had been flagged over a decade earlier, but the pull of simple templates had proved too powerful to shift the academic discourse (see *ibid.*, p. 24, citing Godwin and Shepard 1979).

A particular danger in commons research has been the attraction of an elegant, compelling, but often incorrect model. As Ostrom (1990, pp. 29–30) explains, “[m]any efforts to classify collective-action problems have framed the analysis by presuming that all such problems can be represented as prisoner’s dilemma (PD) games.” Legal scholars in particular appear almost pathologically eager to frame every collective-action problem as a PD (McAdams 2009, pp. 210–211). As McAdams explains, “[l]egal scholars seem to wear PD-colored lenses that trick them into seeing something that is not there” (*ibid.*, p. 218). As a result, they miss what is often there: incentive structures that would enable cooperation (see *ibid.*, pp. 218–235). We might hope that recent literature drawing attention to these dangers and highlighting the potentially superior fit of alternative game structures (e.g. *ibid.*; Cole and Grossman 2010) will spur progress on this front.

### 3. Property in the commons

Two substantive areas of mutual interest to Ostrom and legal scholars implicate some of the most foundational issues in property theory. The first surrounds the meaning of property itself, while the second focuses on the prevalence of mixed systems of private and shared property rights. The interchanges on these topics have been and continue to be true conversations – iterative and ongoing.

#### 3.1. What is property? And why do we care?

Although property is sometimes treated as an all-or-nothing concept, ownership and control over resources comes in shades and degrees (e.g. Schlager and Ostrom 1992). One influential model for understanding that fact has been the “bundle of rights” idea of property associated with the work of John Commons (1893, p. 92) and the legal realists (see Stone 2009, pp. 9–10). Yet property theorists have increasingly challenged the “bundle” metaphor (see e.g. Penner 1996), focusing instead on property’s *in rem* nature (e.g. Merrill and Smith 2001) and emphasizing the significance of boundaries and exclusion (e.g. Merrill 1998; Smith 2004). How does Ostrom’s nuanced treatment of ownership in common-pool resource contexts, which draws in part on the “bundle” idea (see, e.g. Ostrom 2009a, pp. 28–29), fit together with these ongoing conceptual debates about property’s meaning?

Merrill and Smith criticize the bundle metaphor’s implicit message that property is infinitely decomposable, comprising nothing more than “a list of use rights” (2001, p. 397). Schlager and Ostrom’s (1992) taxonomy of property rights dodges this concern. The five resource control rights they identify – access,

withdrawal, management, exclusion, and alienation – are cumulative in nature and available only in functionally meaningful combinations (ibid., p. 252). As they explain, “to hold some of these rights implies the possession of others. The exercise of withdrawal rights is not meaningful without the right of access; alienation rights depend upon having rights to be transferred” (ibid.). This vision of property does not, then, contemplate a bundle that can be thrown together – or pulled apart – in just any old way. But can it be squared with the growing tendency to equate property with exclusion rights that are good against the world?

In one sense, the answer appears to be yes. An understanding of property based on exclusion dovetails with Rose's important insight that a limited-access commons constitutes “property on the outside” (1998, p. 144). That exclusion can help transform what would otherwise be an open-access regime into a manageable commons has been well noted, even if more than mere exclusion is necessary to make a commons work (see Ostrom 1990, pp. 91–92; 2009a, 32). But an exclusion-focused view of property also carries some limitations that are especially relevant in the context of common-pool resources. Most obviously, much of the relevant action for such resources occurs “on the inside,” where participants share a commons (see Rose 1998, pp. 144, 155). Blunt boundary-based exclusion mechanisms would be non-sensical within such a shared resource setting, and giving each participant a right to block the use of the others would likely lead to the problematic underuse often associated with the tragedy of the anticommons (see Michelman 1982, p. 6; Heller 1998; 2008).

The fact that governance rather than outright exclusion is required within a commons does not mean property rights are absent (see, e.g. Smith 2002), but it does limit what a vision of property that focuses on exclusion alone can tell us about them. Katz's (2008, p. 277) observation that boundary-exclusion theories focus more on the implications of non-ownership than on the complexities of ownership has particular traction here. Similarly, an exclusion-focused account of property tends to be relatively inattentive to other potential adjustments to property packages that might prove useful within a commons – including alienability restrictions (see e.g. Rose-Ackerman 1985; Fennell 2009). This omission is significant, given that resource entitlements featuring less than full alienability are frequently observed in CPR institutions, where they appear to perform the core property functions of incentivizing production and investment (see Ostrom 1999, p. 341).

Property theorists also have much to learn from the complex ways in which resource users slice and dice entitlements into special-purpose “tenure niches” (ibid., p. 340, citing Bruce 1995; see Bruce et al. 1993). For example, various forms of “tree tenure” have evolved in many localities that control who may access which trees at what times and for what purposes (Fortmann and Bruce 1988; see Bruce et al. 1993). In addition to reopening questions about whether property can or should be conceptualized in terms of individual use rights, such entitlements stand in some tension with the *numerus clausus* principle, which calls for constraining the menu of permissible property forms (see, e.g.

Merrill and Smith 2000). These issues offer important – and largely unexplored<sup>5</sup> – avenues for further interdisciplinary work.

In all of these instances, operational details in the real world offer property theorists an important gauge against which to test their theories. Property has a job to do, and watching how things get done under different working conditions gives us important insights into what property's occupational requirements look like. Such a functional approach to property can retain skepticism of an unconstrained bundle of rights while directing attention to the rich and complex ways that property rights can work both inside and outside a commons. Significantly, a theory's ability to accommodate within-commons entitlements is not an esoteric frill of interest only to a small cadre of subspecialists. The reason is simple: we are *always* operating at least partially within a commons of some sort. The next section explains.

### 3.2. All the world a semicommons? The ubiquity of mixed systems

Property, as experienced on the ground, is never wholly individual nor wholly held in common, but instead always represents a mix of ownership types. Indeed, two of the most foundational institutions in modern life – the neighborhood and the corporation – plainly constitute “mixed systems of communal and individual property rights” (Ostrom 1999, pp. 351–352). A family may privately own a house and the lot it sits on, but that family also holds interests in common with other households with respect to the neighborhood's ambience and the community's amenities.<sup>6</sup> If we look inside the house, we will see that much is owned in common by the household, although certain elements (food harvested from the refrigerator, or rooms reserved for certain occupants) are effectively privatized (see Ellickson 2006, pp. 319–320).

Interacting combinations of individual and collective entitlements are also found in the what we might ordinarily view as “the commons” or even in wholly open-access contexts. Indeed, the prototypical tragedy of the commons is produced not by common ownership alone, but rather by the interface between a communally owned element (the pasture) and individually owned elements (cows, and the grass they ingest) (see Fennell 2011, citing, e.g. Alchian and Demsetz 1973, pp. 22–23). Many modern resource interactions similarly represent instances of “partial propertization” that are capable of being resolved in more than one way (see Rose 1998, pp. 152–153, 169–173). Privatizing ownership of more elements is one option, but as long as some resources cannot be reduced to individual control,

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<sup>5</sup> A recent search of a major legal scholarship database yielded only two articles containing Bruce's intriguing term “tenure niches” – one of which was coauthored by Elinor Ostrom (Westlaw's JLR database, July 28, 2010). Similarly, scarcely more than a handful of references to “tree tenure” could be found among the thousands of articles on property rights and natural resources (*ibid.*).

<sup>6</sup> While residents in private common interest communities literally share ownership of common elements (see Ostrom 1999, p. 351), zoning grants even those who live in ordinary neighborhoods a form of collective property rights (Nelson 1977, pp. 15–18).

proportization must remain partial [see *ibid.*, p. 173 (noting “the ease of proportizing land in comparison to the diffuse resources to which land is attached, like air, water and wildlife”)]. Alternatively, more elements could be placed under common control, as where the commoners share rights in the cattle as well as the grazing land (see Alchian and Demsetz 1973, p. 23). But this, too, is an incomplete move. Insofar as labor inputs remain under private control, efforts to restrain grazing must be replaced by efforts to control shirking (*ibid.*, pp. 23–24).

Property theory, then, largely boils down to intelligently confronting (and, as necessary, adjusting) the interface between individual and collective entitlements. Theoretical work on the semicommons offers a useful starting point in thinking about that challenge. As Smith explains, medieval common fields accommodated two activities – farming and grazing – carried out at different scales under different ownership regimes (2000, pp. 135–136). Strips of farmland were private property, with each farmer owning a number of strips scattered throughout the common field, but the field itself was collectively used as a grazing area on a seasonal basis (see *ibid.*, p. 132, 135–137).

Smith suggests that the scattered-strip ownership pattern, by interweaving property interests, controlled the impulse toward self-serving behavior (*ibid.*, pp. 146–154).<sup>7</sup> Without a contiguous parcel of one's own, actions designed to benefit or burden one's own land become more difficult to carry out; one cannot help oneself without also helping others or harm others without also harming oneself (*ibid.*). Similar functions are served by the cattle “wintering rules” used in Swiss villages, which prohibit sending more cows to the grazing lands than one can feed during the winter (Ostrom 1990, p. 62), as well as by schedules that mingle positive payoffs like festivities with “work days or days of reckoning” (*ibid.*, p. 65). In all these cases, thoughtfully designed links between private and communal elements help to soften the disjunction in incentives that might otherwise occur in these hybrid systems.

Thinking about property in this way emphasizes its potential, as a human institution, to adapt dynamically to changing circumstances. When the incentive misalignments associated with a particular mixed property regime become too great, the law can react by moving the wall between common and private elements (e.g. converting some privately owned elements, like grazing animals, to common ownership, or, conversely, privatizing some commonly owned elements, as through the parcelization of land) or by changing the shape or content of the entitlements on either side of the wall (by, for example, placing limits on use or alienability, or altering the way in which private elements interact with ones held in common, as through the use of scattered farming strips in a common field). Incentives can be realigned by altering the rules or payoff structures in other ways as well, whether through regulations, taxes, harvesting caps, or limits on the time,

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<sup>7</sup> A number of other explanations for the scattered strip arrangement have also appeared in the literature, including the diversification of risk thesis proposed by Deirdre McCloskey (see Smith 2000, pp. 154–160).

place, or manner of harvesting (see, e.g. Rose 1991, pp. 8–12; Krier 1992, pp. 334–335).

## 4. Scale and the commons

As the discussion above suggests, mixed ownership regimes are neither unusual nor avoidable. Understanding why requires examining the question of scale, another theme prevalent in Ostrom's work, and one that has some of the deepest and most interesting connections to law.

### 4.1. Diverse endeavors: different efficient scales

The fundamental reason that mixed systems are inevitable is that different activities are best pursued at different scales. For example, sheep might be grazed on a common pasture if the costs of fencing, the habits of sheep, or other factors produced economies of scale that made the minimum feasible pasture size larger than any one shepherd could cost-effectively own and maintain. Yet there may be diseconomies of scale when it comes to pooling ownership of the sheep themselves. If sheep-raising is best pursued through individual ownership of the animals, while grazing is best carried out on a communal pasture, some care must be taken to ensure that the ownership of the private element does not become a platform for visiting disproportionate harms on, or reaping disproportionate benefits from, the communal element (see Smith 2000, p. 132).

In some instances, the resource system itself exists at a certain scale, as in the case of oil and gas reserves.<sup>8</sup> In effect, the activity of fuel production has already occurred at a scale that is defined by the edges of a given reserve, and presumably the associated activity of fuel storage cannot be efficiently conducted at any other scale [cf. Ostrom 1990, pp. 104–106 (making an analogous point about groundwater in the Los Angeles area)]. It is of course possible to pursue the activity of *fuel extraction* at a different scale, perhaps using land ownership to ration access. But property lines established to accommodate differently scaled activities (such as farming) will be positioned arbitrarily with respect to the reserves. Uncoordinated access to a fugitive resource through separately owned surface parcels can quickly degenerate into costly forms of “extractive anarchy” (Libecap and Smith 2002, pp. S591–S592).

If the owners of the overlying land can coordinate their efforts and act as a single body with respect to the resource, however, wasteful extraction efforts can be avoided (*ibid.*, pp. S595–S596). This is the goal of unitization agreements (see *ibid.*), which effectively rescale extraction to better fit the scale of the resource system. Here, as elsewhere, forming a collective to make decisions for the unit as a whole can offer a lower-transaction-cost alternative to bargaining over each

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<sup>8</sup> To say that a resource exists at a particular scale is another way of saying that it is indivisible, or at least not easily divisible (see, e.g. McKean 1996, p. 228).

choice (see Coase 1960, pp. 16–17; McKean 1996, pp. 229–230).<sup>9</sup> But achieving unitization in the first place can be extremely difficult if it requires the consent of all affected landowners (see Libecap and Smith 2002, p. S596). Thus, state law often calls for mandatory unitization once a certain percentage of owners reach agreement – a solution that is not without some risks and costs of its own (see *ibid.*, pp. S596, S606–607).

As this example illustrates, an *ad coelum* vision of property – one in which three-dimensional columns (or wedges) of ownership reach up to the heavens and down to the depths (see, e.g. Banner 2008, p. 17) – fails to account for the possibility of multiple efficient scales at different levels. The unsustainability of strict adherence to the *ad coelum* doctrine becomes even clearer when we look skyward to consider the most efficient scale at which to carry out another important modern activity: air travel. Working out agreements with every underlying landowner would be prohibitively costly (see, e.g. Heller 2008, pp. 27–28). Unsurprisingly, the law ultimately rejected any right of landowners to exclude airplanes from the navigable airspace above their parcels, where the overflights did not disrupt the use of the land itself (see *ibid.*, p. 29; see generally Banner 2008).

Although flight paths over parcelized land offer a particularly striking illustration of scale misalignment, more mundane examples abound. Neighborhood ambience cannot be produced at the individual lot level, even if that is the most efficient scale at which to consume residential housing services. Information may be best consumed in large aggregations, but best produced by individual creators. Fishing may be best conducted at a small scale by individuals and firms, but sustainable levels of fish reproduction must be carried out across entire ecosystems. Choices about how and when to use one's talents might be most efficiently placed under the control of the individual herself, but a large construction project requires the pooling of many workers' mental and physical exertions. And so on. In each case, choices must be made about how to accommodate these multiple scales and how to manage any resulting abutments between different ownership regimes.

Two additional wrinkles relating to scale deserve attention. The first has to do with the appropriate scale at which various sorts of rules should operate, which relates in turn to higher-order limits on the permissible content of localized arrangements. The second relates to the relationship between scale and time.

## 4.2. Scaling rules

The local management of common pool resources generally takes place within one or more larger jurisdictional frameworks that are designed to serve the needs of a

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<sup>9</sup> Another possibility would be for a single owner to buy up all the natural oil or gas rights from landowners, thus privatizing the stock as well as the flow [see Libecap and Smith, S593 and n.15, citing Demsetz 1967, 357; see also Lueck 1989, pp. 301–303 (making parallel points in the context of wildlife populations)].

broader community or population. Ostrom's focus on "nested enterprises" (1990, pp. 101–102; 2009a, pp. 42–43) reflects this fact, as well as the possibility that complex resource systems may themselves require more than one level of local management (1990, pp. 101–102). An important challenge, then, is determining the appropriate scale, and hence the appropriate jurisdictional level, at which to make resource-related decisions (see Marshall 2008, pp. 79–82). The notion of subsidiarity, which calls for delegating authority to the smallest jurisdictional unit that is competent to handle it (see, e.g. *ibid.*, pp. 80–81; Ellickson 1998, p. 80; Ostrom 2009a, pp. 42–43), offers an important starting point, especially given the importance of localized knowledge and norms in crafting enduring solutions (see generally Ostrom 1990).

Given the vulnerability of CPR institutions to intrusions on functions like rulemaking and exclusion (see, e.g. *ibid.*, pp. 201, 205), it is perhaps unsurprising that one of the design principles Ostrom associates with enduring institutions is "minimal recognition of rights to organize" (*ibid.*, 101). Such recognition might be said to exist where "[t]he rights and ability of appropriators to devise their own institutions are not challenged by any other authorities, internal or external, that have the ability to undermine the institution" (Morrow and Hull 1986, p. 1651; quoted in Ostrom 2009a, p. 42). This principle is often violated; Ostrom's work is replete with accounts of localized solutions thwarted by governmental action. Diverse examples from Canada, Brazil, and Nepal show how national law and policy can threaten local institutions and the resources they are managing (Ostrom 1990, pp. 175–178).<sup>10</sup>

Yet a "hands-off" governmental policy is not always the answer, nor is devolution to local appropriators always indicated. There are two sets of reasons that rules developed at a higher jurisdictional level might appropriately limit the content of local institutional arrangements: to protect those outside the local group from spillovers, and to protect those inside the local group from oppression or exploitation. The first motivation, protection of outsiders, often replicates the same basic concerns we have already seen in managing the interface between private property ownership and common property ownership. As Ostrom and Schlager explain, "[j]ust as individuals can find themselves in commons dilemmas if they fail to coordinate their use of shared resources, so too can local-level organizations" (1996, p. 146). For example, a local fishing collective might band together to maximize their collective yield but visit externalities on others drawing from the same population of fish (*ibid.*, pp. 146–147).

The second motivation, protection of insiders, is even more interesting. For example, the development of a free and democratic state (a large-scale endeavor) requires that people not be allowed to enslave or exploit each other.

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<sup>10</sup> In some cases, the governmental role is more complex. For instance, local fishers in Mawelle, Sri Lanka had legislative backing for their net limits, but officials' amenability to pressures and inducements undermined those limits, generating costly conflict (Ostrom 1990, pp. 149–157, citing Alexander 1982).

Similarly, localized management systems that place disproportionate burdens on, or disproportionately withhold benefits from, people based on morally arbitrary criteria like race, ethnicity, or sex can run afoul of important projects and normative commitments of the larger jurisdiction within which the commons is nested.<sup>11</sup> The question of which additional side-constraints should apply within private communities that people join voluntarily remains a robust area for discussion.

A more complex set of issues relating to the protection of both outsiders and insiders can be traced back to Commons's observation that property rights inevitably implicate governmental power, and hence embody distributive choices (1893, pp. 107–111). For example, deciding whether certain rights will be held in common or turned into private property for individuals, households, or firms, will influence relative wealth levels among different members of society – and not always in the ways one might initially expect (see Chander and Sunder 2004). Here too, we must confront the implications of heterogeneity: “Rarely do all the participants using a resource have identical investment or harvesting power” (Ostrom 2009b, p. 222). While it is not possible to do more than flag these normative issues here, it is worth underscoring that one of the places where law touches Ostrom's work most interestingly and controversially is in deciding which decisions must be made at which level.

### 4.3. Scale over time

Institutions and resources both exist in time. Questions of temporal scale (see, e.g. Geores 2003, p. 83) arise in at least two ways. First is the appropriate time horizon over which to apply rules or institutional practices. Institutional entrenchment broadens the temporal scale, increasing stability but reducing flexibility to adapt to changed circumstances or new information (see Daniels 2007). Institutional features, such as voting rules, can be adjusted to raise or lower the amount of institutional drag. For example, Ostrom (1990, p. 65) observed the effects of unanimity rules on the rate of institutional change in Swiss villages in response to rising labor costs. As Buchanan and Tullock have usefully elaborated, those selecting voting rules must trade off the expected costs of making a decision against the expected costs of a decision adverse to one's own interests (1962, pp. 63–72 and figs. 1–3). Here, as elsewhere, heterogeneity among those using a resource presents complications.

Second, and closely related, the most efficient scale at which to use a given resource may change over time. Land, enduring and versatile, offers a classic example. At Time 1, land might be most efficiently used as a large farm, at Time 2, it might be most efficiently used as private residences, and at Time 3, it might be most efficiently used as an extensive mixed-use development. Various feats of

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<sup>11</sup> Marshall (2008, p. 78) lists discrimination among the problems requiring the involvement of higher levels of governance. Of course, a central government might be unprotective of civil rights, or even hostile to them.

disaggregation and aggregation are required to accomplish these moves. In each case, consent from those who currently own or control the land must be obtained (or the lack thereof overridden) and the surplus from the shift must be divided in some way (see, e.g. Fennell 2008, p. 7). Literature on the tragedy of the anticommons emphasizes one source of trouble: it can be hard to move from Time 2's privately held residences to Time 3's large-scale development without overriding the need for unanimous consent through eminent domain or some institutional alternative to it (e.g. Heller and Hills 2008). But the move from Time 1 to Time 2 may be equally difficult if many people hold stakes in the farm and must agree to the subdivision and sale of the land. As the history of the enclosure movement suggests, holdouts can impede property shifts in the commons-to-private direction, as well as shifts that run in the opposite direction (see, e.g. Dahlman 1980, p. 187).

These questions of efficient scale over time have much in common with concurrent mismatches between efficient scales (see Fennell 2011). Just as landowner consent is overridden to allow air travel (a simultaneous use at a different scale) so too may it be overridden to allow land to be aggregated or disaggregated in particular ways to accommodate uses at different scales over time. But overriding consent outright presents problems of its own, as the controversy surrounding eminent domain illustrates. Designing workable ways to sidestep strategic behavior to accommodate multiple scales, while at the same time minimizing intrusions into the prerogatives of ownership, represents a primary avenue for further research.

## 5. Closing thoughts: the commons of commons research

This essay has focused on the interplay between Ostrom's ideas and those of property scholars. I hope that the discussion here, brief though it has been, has offered some insight into the debt of gratitude that legal scholars working on property rights owe to Ostrom, as well as some of the ways her work and ours can achieve valuable synergies. With those synergies in mind, I will close with a few observations about interdisciplinarity.

In addressing the problems of the commons, we are all participants in an intellectual commons. The resource is non-rival in one sense: we can all draw ideas from it without diminishing those left behind for others to use, so there is no risk of "overgrazing." But this commons nonetheless remains susceptible to collective action problems. Academic incentive structures can help to overcome the problem of underprovision by rewarding publication and other contributions. But those same incentive structures may also cause contributions to be underutilized, and, indeed, may render them less than optimally useful. A congestion effect may result from conflicting uses of terms and concepts in different subfields. Certain forms of conceptual blindness may be almost contagious within fields of inquiry, causing scholars to overuse certain ill-fitting templates to the exclusion of more nuanced models. More generally, disciplinary divisions may create artificial boundaries that impede larger-scale inquiries across areas (see Poteete et al. 2010, pp. 265–266). These problems stand in an interesting tension with

each other. As a profusion of inconsistent terms drive up the noise-to-signal ratio, cross-disciplinary interactions as well as progress on recurring, core problems may become impossible; without a shared language, collaboration grinds to a standstill (see, e.g. Ostrom 2010, p. 12). Using the same terms and concepts in the same way tends to facilitate cross-disciplinary conversations and keeps the field of discussion clutter-free, but it may also create an unhelpful path dependence by drawing scholarship into existing well-worn grooves.

Questions of scale resurface as well. The best conceptual or methodological scale for the production of knowledge may sometimes lie within the intensive bounds of a particular discipline. But at other times, advances depend on communication across disciplines. Ostrom and her coauthors recently reiterated that “the gains from disciplinary and methodological cross-fertilization are greatest when scholars with a solid command of their own disciplines and methods interact with each other” (Poteete et al. 2010, p. 271) and suggested that “[c]ross-fertilization may occur *either* through a series of studies that respond to each other using different methods and drawing on diverse disciplinary perspectives, *or* through integration of multiple disciplines and methods within a research program” (ibid., p. 272). Fine-tuning disciplinary boundaries to accommodate both within-discipline cultivation and across-discipline fertilization represents a challenge not unlike that of simultaneously fostering both good animal husbandry and good pasture maintenance.

These lessons are, of course, applicable to areas of scholarly inquiry that seem far removed from work on the commons. Yet, as I hope the discussion in this essay has suggested, the commons is never really very far away.

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