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## MISMATCHED PROPERTY RIGHTS

# Thinking about the Commons

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This article explores current developments in theoretical thinking about the commons. It keys off contemporary reconsiderations of Garret Hardin’s “Tragedy of the Commons” and Elinor Ostrom’s response to Hardin in *Governing the Commons* and later work. Hardin’s idea of a “tragedy” has received much criticism, especially from Ostrom herself; but Ostrom’s own work has also raised some questions in more recent commons literature. The key issue that emerges from this reconsideration revolves around the understanding of commons on the one hand as limited common regimes, central to Ostrom’s work, or on the other hand as open access, as espoused by more recent advocates of widespread access to information and communications networks.

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As we move into the third decade of the twenty-first century, the idea of “the commons” has come to enjoy great currency as an organizing concept among social science scholars throughout the world, as witnessed by the numerous and widely-cited contributions to this *International Journal of the Commons*. The enthusiastic uptake of the commons terminology for a great variety of empirical and theoretical studies—ranging in subject matter from community resource management to information technology, with much in between—is only a few decades old, however. The commons usage for the most part dates from the late 1960s, with the publication of Garrett Hardin’s article in *Science* on “The Tragedy of the Commons” (1968), and then powerfully—albeit critically—reinforced by Elinor Ostrom’s response in her *Governing the Commons* (1990).

How do scholars today view these two dominating theoretical framing works? My plan here is to explore at least some of the current answers to this question, primarily—although not exclusively—among American academics, and I will organize my remarks around the reassessment of and follow-on research originating with these two major figures. Hardin’s brief article crystallized the modern interest in the characteristics of commonly-held resources; while Ostrom’s *Governing the Commons* responded that the commons need not be tragic at all, particularly in cases in which a community can manage a commons of limited scope. Ostrom’s work in turn encouraged a flood of research into both past and contemporary common property issues, and indeed, her own work on those topics was far more extensive and systematic than Hardin’s relatively offhand remarks, which she criticized sharply. Much of the reconsideration of Hardin’s “Tragedy” has in fact been rather critical, perhaps taking a cue from Ostrom herself. But Ostrom’s work too has come in for its own share of critical reconsideration, on grounds of both method and content.

In this essay I will first take up the current historical reassessment of Hardin’s “Tragedy,” where a chief criticism is that his ideas were not actually so original. I will then turn to some recent assessments of Ostrom’s work on limited commons management, work that remains widely celebrated but also criticized—if only gently—on grounds of methodological vagueness and of its sometimes contestable economic and political content. I will then follow with a discussion of what seems to me the chief challenge to the Ostrom school of commons scholarship, namely situations in which “commons” refers not to relatively closed limited commons but rather to the open access commons—e.g. internet communications and large-scale environmental problems, where issues of governance are acute. I will conclude with a mention of some of

the many topics that I have left un-discussed, and that suggest some directions for future scholarship in the theory and practice of the now broadly deployed concept of the commons.

## I. History and Garrett Hardin's "Tragedy of the Commons"

The term "commons" is quite old in the English language, but until just after the middle of the last century, it had a fairly limited set of meanings. First, the "commons" referred to the agricultural common fields that constituted part of the medieval rural economy; normally these fields were open to village residents and used for grazing livestock, cutting wood, and other low-level extractive activities. Second, the "commons" referred to meeting places in towns or villages, where the residents could come to discuss political issues, hold local festivals, or engage in other village- or town-wide activities. Third, and by extension, the "commons" referred to common spaces in buildings like university structures, where the students could eat, relax, and meet friends.

The more generalized use of "the commons" as a shortcut term for all kinds of multi-person activities—often with vexing organizational problems—stems from Garrett Hardin's very well-known "Tragedy of the Commons." In this 1968 article, which Hardin wrote chiefly to warn of the dangers of overpopulation, he famously applied the term "commons" to a great variety of scenarios in which some resource is open to all, with few constraints on resource use. In these scenarios, he argued, the tendency of each individual is to use the resource to maximize his own immediate interest while neglecting investment or effort that might conserve the resource for others or for future common use. According to Hardin's thesis, each individual rationally calculates that he can take all the gain from his own use of the common resource while sharing the losses with all the other users. The tragedy emerges because, by following this same logic, all the users together decimate the common resource. In Hardin's view, the only way to allay the tragedy was through governmental coercion (which he later called "Leviathan"), or division of the commons into private property (Hardin 1968; 1978, 314).

Hardin's immediate concern, of course, was what he saw as a crisis of overpopulation. The relationship to the commons came in his analogy of individual "breeders" to the users of an unregulated commons. But his examples of other types of commons ranged broadly. He wrote most prominently of the herders whose numerous livestock overgrazed a common field, but he also cited overfishing and overhunting, autos cruising for parking places, and air pollution and water pollution, among other examples.

Hardin's article thus deployed the term "commons" for collective action problems more generally, and since the article's appearance, vast numbers of other writers have discussed "commons" issues in this more general sense, some embracing Hardin's theory of overuse and underinvestment, and others contesting it. The fiftieth anniversary of Hardin's article arrived in 2018, and this put the article itself back in the spotlight, along with Hardin's general conception of the commons. Legal historian David Schorr, of the University of Tel Aviv's Buchman Faculty of Law and Cegla Center for Interdisciplinary Research in Law, took the occasion to organize a retrospective conference on the article, and a symposium issue in the Cegla Center's *Theoretical Inquiries in Law* followed (Schoor et al. 2018).<sup>1</sup>

The Cegla symposium is a convenient starting point for consideration of recent thinking on the commons concept, and especially on its history. Several of the symposium contributions emphasize that Hardin was not saying much that was new in his observations on the fragility of resources held in common. Indeed, UCLA Law School's Stuart Banner describes Hardin's idea as "banal," and he observes that thinkers since Aristotle have discussed the problem of overuse and underinvestment in commonly-held resources. Although Banner tracks the overuse idea through various medieval and early modern writings, he particularly stresses the contribution of nineteenth-century economist William Forster Lloyd. Lloyd himself was responding to Thomas Malthus' argument that overpopulation would stem from the general dearth of self-control, and Lloyd's commentary not only anticipated Hardin's arguments about overpopulation but used the very example – cattle grazing in an open field – that Hardin so famously deployed in the "Tragedy." Indeed, Hardin himself acknowledged that he had borrowed Lloyd's example, although he was very stingy with his credit to his predecessor. In Banner's view, Hardin's principle achievement was not his analysis of the commonly held resources, which had been observed for centuries, but rather in providing a "catchy name" for their problematic character, a name that has been with us since Hardin's article (Banner 2018).

As Banner and others have pointed out, Hardin neglected or ignored quite a number of other serious prior and contemporary efforts to recognize and deal with the overuse problem. Perhaps most notable was the work of resource economist Scott Gordon, who in 1954 had analyzed the problem of the commons in the context

<sup>1</sup> Professor Schorr recruited me to a nominal position as co-editor, but he did by far the bulk of the work in soliciting, organizing, and editing.

of fisheries, concluding that overuse resulted from a divergence between the average cost and the marginal cost of the use of common resources. This divergence arose because each additional fisherman calculated his costs at the average of all the predecessor fishermen, without taking into account the increasing level of resource pressure that each new fisher would add. And Gordon was not the only contemporary theorist. In 1965, economist Mancur Olsen used collective action theory to analyze political activity and particularly the systematic over-expenditure of public funds in representative government. In 1967, just a year before the publication of Hardin's "Tragedy," economist Harold Demsetz had used the overuse of common pool resources to exemplify the phenomenon of "externality," in which users act without taking into account the effects on others (or even themselves in the longer run, in the case of common pool externalities). Hardin did not appear to be aware of any of these theorists' work.

To be sure, these works were written by economists rather than scholars in Hardin's academic field of biology. But Hardin might have been expected to pay more attention to the material with respect to fisheries that historian Harry Scheiber cites in the Cegla symposium. As Scheiber describes at length, in the decades before the Tragedy appeared, the problem of depleting fish stocks had generated numerous conferences, articles (including Scott Gordon's), and practical measures to combat overfishing—none of which Hardin acknowledged (Scheiber 2018).

Legal historian David Schorr is only slightly less sharply critical of Hardin's "Tragedy," locating it in a kind of meta-historical tradition that he describes as "stadial." In this rather old-fashioned type of analysis, historians describe societies as evolving in stages, from primitive through agricultural, and then on to commerce, manufacturing, and ultimately modern technology. Schorr argues that the analyses of commonly held resources, including Hardin's, follow a pattern in which writers describe a progression of stages. In Hardin's case, the stages are somewhat terse: unregulated commons at the primitive stage, and at the more advanced stage, either private property or government command. According to Schorr, the more general pattern is to describe several stages, typically four: first the commons is ungoverned, then subject to something like tribal exclusion, followed by regulatory measures, and finally divided into private property (Schorr 2018).

Parenthetically, I know this old-fashioned progression well, because Schorr uses as an example an article that I wrote in 1991 on several stages of environmental management. For those who may be interested, I will leave my defense to a footnote.<sup>2</sup> The main point is that recent scholars re-examining Hardin's "Tragedy of the Commons" from an historical perspective have generally been quite critical, and their critiques have been softened chiefly if not entirely by the point that his main concern was to deliver a jeremiad against overpopulation. Given that central concern, Hardin may not have been expected to know a great deal about work in other disciplines on what was to him a relatively off-the-cuff analogy. But another kind of critique is that Hardin was simply wrong in one or another of his central claims—a critique that brings us to Elinor Ostrom and her school.

## II. Social Science: Elinor Ostrom and the Limited Managed Commons

Elinor Ostrom burst on the scene of commons scholarship with her 1990 book, *Governing the Commons*—a book that has been central to commons scholarship ever since. And she was more than ready to combat the idea that the commons is tragic, or more particularly, that the sole cures for commons issues were governmental coercion on the one hand or private property on the other. In *Governing the Commons* as in almost everything else she wrote subsequently, she included an early paragraph or two chiding Garrett Hardin for his assertion that the only ways to manage common resources was through these two routes (Ostrom 1990, 9–10; Ostrom et al. 1999, 278). On the contrary, she argued, experience showed that people

<sup>2</sup> My article was *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 *Duke Law Journal* 1, in which I argued that as common pool losses occur, people are likely to shift strategies from doing nothing, to limiting access to a group, to regulating behavior, to creating more fine-tuned individual property rights (as with pollution emissions permits). This is definitely "stadial," but Schorr's article gives me an opportunity to say more about stadial analysis. First, at the most general level, it is not possible in human language to discuss different trends without dividing them into some kind of categories, whether one calls them stages or not. Second, while some stages may be entirely artificial (17<sup>th</sup> century, 18<sup>th</sup> century), there may be real differences in techniques and consequences in others, as there are in environmental management strategies, such that a shift from one to another is noticeable to those affected. An example is the adoption of tradable emissions permits as a pollution reduction strategy under the 1990 Clean Air Act Amendments, which generated intense argument as a shift from a prior pattern of behavioral regulation (so-called Command and Control). Third and finally, while discussions of environmental responses may suggest stages, these are not necessarily unidirectional, but instead respond to conditions of scarcity or demand, moving in one direction with greater scarcity/demand but in the opposite direction if those conditions lessen. Aside from my 1991 article, another example is Terry Anderson and P.J. Hill's well-known description of the evolution of property rights in the American west (*The Evolution of Property Rights: A Study of the American West*, 18 J. Law & Econ. 163–179 (1975)) which observed regulatory relaxation as demand decreased for certain resources, e.g. horses.

often figured out ways to organize and manage common resources through community-based governance methods rather than governmental “Leviathan” or private property.

Like Hardin’s “Tragedy,” Ostrom’s work followed on that of a number of other scholars; in her case, those were scholars who had criticized Hardin’s thesis during the decade or two prior to her breakthrough book, or who themselves had studied community-based management schemes. In 1985, for example, Susan Buck Cox had published the provocatively-titled “No Tragedy of the Commons,” citing a number of successful commons management schemes through history; and in 1987, James Acheson and Bonnie McCay had published a compilation of studies of community-governed resources entitled *The Question of the Commons*. But unlike Hardin, Ostrom not only acknowledged the works of predecessors but championed them. In her *Governing the Commons*, she came up with her own list of “design principles” that encouraged successful community-based commons management, but she drew repeatedly on examples from —among others— Meg McKeon’s studies of Japanese villages’ common forestry practices, R. Netting’s description of alpine communities and their common stock grazing rules, and A. Maass and R.L. Anderson’s work on Spanish communal irrigation systems that dated back to the Muslim era.

Elinor Ostrom, together with her husband Vincent Ostrom, had already founded the Workshop in Political Theory and Policy Analysis at the University of Indiana, but after *Governing the Commons* appeared, the Workshop became a veritable incubator for commons studies all over the world. Many of her students’ and associates’ studied the kind of traditional community-based resource management that dominated the examples in *Governing the Commons*, but by 2000, Ostrom herself had grown more interested in extending her methods—first her “Design Principles” and later her “Institutional Analysis and Development” (IAD)—to more contemporary topics. She became particularly interested in the social organization of modern technological dissemination of information, and at times she joined forces with what might loosely be called the “Copyleft” critics of intellectual property. These were generally legal scholars and activists who eschewed the propertization of intellectual achievements and often analogized IP to the enclosure of the commons in early modern England (Boyle 2003; Hess & Ostrom 2003).

Given Ostrom’s own generosity in citing and promoting the work of others, it is entirely fitting and perhaps not surprising that along with numerous prizes in her own field of political science, her work has received high praise from scholars in many fields. The capstone honor was Ostrom’s 2009 receipt of the Nobel Prize in Economics (along with Oliver Williamson). But Ostrom’s work has continued to receive high praise since her death in 2012. University of Chicago Law Professor Lee Anne Fennell, for example, wrote a highly laudatory piece called “Ostrom’s Law” in a 2011 retrospective on Ostrom’s work in the *International Journal of the Commons*, and Fennell’s article—describing Ostrom’s Law as “whatever works in practice can work in theory”—has become one of the most-cited contributions to this journal.

But in recent decades, scholars interested in commons issues have also voiced some hesitations and critical concerns about Ostrom’s approach to resource management. One important note was sounded by political scientist Arun Agrawal, whose own work on communal forestry in India is very much a part of the standard Ostrom-school commons literature. In 2002, in a volume edited by Ostrom herself and some of her associates, Agrawal praised the explosion of common-property scholarship for dispelling the notion that “the commons” was simply a relic of a long-gone era, and for showing that community management continues to be a vital aspect of contemporary sustainable practice (Agrawal 2002, 46). These research findings, he asserted, issue a cautionary note about the drive toward privatization as well as toward central state management in modern development economics.

But Agrawal also observed that the numerous case studies of local practices generally paid insufficient attention to social, institutional, and technological contexts; and perhaps more seriously, the studies cited many different and seemingly interacting factors for success, and for that reason they arrived at no consistent theory to explain viable and sustainable commons management (Agrawal 2002, 42–45, 56–58, 64–67, and 71). Indeed, in these common property studies, “success” itself appeared to mean longevity, the avoidance of resource depletion, and what were described as fair outcomes (Agrawal 2002, 44). (Parenthetically, it would be entirely possible to identify success as something else—for example, greater productivity, or a different version of fair outcomes, to which I will return shortly.) One might say that the general thrust of Agrawal’s comments was that Ostrom’s Law—that what works in practice can work in theory too—had not yet been enacted.

It would appear that it has still not been enacted, perhaps leading to at least a temporary economics-centered takeover of Ostrom’s own workshop at the University of Indiana: from 2014 to 2019, the economist Lee Alston served as the director of the workshop; another economist, Dean Lueck, continues as the director of the workshop’s Natural Resource Governance section. Both are interested in real-world development

and environmental questions, but their approach is clearly that of economics, and more specifically microeconomics.<sup>3</sup>

### III. The Critique of the Limited Commons and the Turn to Open Access

While Ostrom and her followers initially focused on community-based commons governance, a number of other scholars observed some ways in which these kinds of regimes might encounter problems. Robert Ellickson's *Order Without Law* (1991) appeared just a year after Ostrom's *Governing the Commons*, and it too studied norm-based community understandings and customs for managing overlapping resource uses. Ellickson used as a primary example the practices of a ranching community in northern California—practices that operated outside the formal legal structure and sometimes even contrary to it. But Ellickson observed a point not much stressed in the Ostrom commons literature: that there were some problems that community norms were simply not equipped to manage. The county ranchers arrived at quite efficient norm-based methods for dealing with cattle straying from ranch to ranch, but in cases where cattle strayed onto highways and collided with automobiles, the formal law governed, particularly where the accidents were more serious (Ellickson 1991, 82–103).

In subsequent years, other scholars have expanded on Ellickson's observations about the potential weakness of community norms in the setting of larger-scale issues. I myself observed several times in the 1990s and 2000s that traditional communities were not good at managing large-scale resource issues like air pollution, and that they are frequently unable to withstand the pressures of a larger commerce, falling apart when their assets attract the attention of larger-scale economic interests (Rose 2002). In a considerably more biting recent version of this critique, Brigham Daniels argues that the standard commons studies are misguided, effectively romanticizing antiquated common property regimes. Daniels views these community-based regimes as rigid and incapable of keeping up with modern technological development, and thus ultimately welfare-reducing (2007).

A related critique is more political than economic. Like some others, I have noted that however much common property norms might appear to be fair as among the community's major players, those major players are not the only persons whose interests are at stake; many traditional communities are shot through with layers of hierarchy, and especially with norms about gender roles (Bosselman 1996; Rose 2002). One major scholarly work along this line is that of Hanoeh Dagan and Michael Heller, who have called for a "liberal commons" in contrast to the "illiberal commons" associated with what Ostrom counted as successful community management regimes. They argue that while community decision-making is still a matter of great importance in modern institutions such as condominiums, the participants require an outlet of what Dagan and Heller call "exit" —the ability simply to *leave*, albeit a somewhat constrained ability (2001). It is not clear, however, that such an exit option is compatible with traditional organization of commons communities, given that so many arrangements in those communities focus on preserving continuity and commitment (Smith 2000). In any event, a democratic deficit continues to haunt the modern human rights efforts to protect traditional groups' lands and other assets. This is because the effort to protect a given community's claims *qua* community entails leaving intact the traditional ways of allocating access—which means also leaving intact potentially abusive and antidemocratic practices within the community (Sunder 2000; Twiss 2004).

All these caveats about traditional community versions of the commons essentially concern a particular type of commons, that is, the limited common property regime, one whose borders and rules of access are bounded and policed. Indeed, limited access is one of Ostrom's early design principles (Ostrom 1990, 91). But there is another much-used version of "commons," perhaps even a rather naïve one: the commons as open access. As Ostrom herself pointed out, the commons as open access appears to be what Hardin had in mind when he described the commons as tragic. But open access is also what traditional international law scholars have had in mind when they have described very large areas of open access, particularly the oceanic commons. International law has never really dropped an interest in this kind of very large commons, as for example in the continuing international interest in issues of navigation and of claims to seabed resources. Just within the last few years, concern over climate change has opened up a new area of academic interest in this version of the commons—that is, the very large commons that is open to all simply by virtue of its vast size and diffuseness. For example, some environmentalist lawyers now argue that there is an "atmospheric trust" that governments are presumably obligated to preserve for the benefit of all (Blumm & Wood 2017).

<sup>3</sup> The current Executive Director of the Ostrom Workshop is Scott Shackelford, a professor of law and ethics and a specialist in cybersecurity.

There is another version of the open access commons that scholars now discuss at length, and I myself played a role in the discussion, although I did not know it at the time. Some years ago, even before Ostrom published *Governing the Commons*, I wrote an article called “The Comedy of the Commons” in which I attempted to account for certain kinds of spaces that seemed to have defied private property designation over long time periods and in many places. Legal institutions going back to the Romans have kept such spaces open to the public, in spite of the fact that unlike the vast oceans or atmosphere, they were and are capable of enclosure. In earlier times, these spaces were usually corridors of transportation, especially roads and waterways, but also to some degree public squares and parks, and more recently, recreational areas. I argued in the “Comedy” that unlike the case with much property, where exclusive boundaries encourage individual investment and effort, our laws have kept these spaces open in large part because their openness is more productive than enclosure. Open access in roads and waterways and public squares encourages more users, and thus promotes what are now called “network effects,” especially commerce and communication (Rose 1986).<sup>4</sup> My expectation was that others would make the same kinds of arguments for public-ness or open access with respect to more modern communications technology (Rose 1998).

The “Comedy of the Commons” made a modest splash when I first published it, but to my amazement, it came to have a much larger second life in the internet age. This was not due to me, but rather to scholars like Larry Lessig, Brett Frischmann, and especially Yochai Benkler. Benkler has argued that learning and innovation is generally better encouraged by “network learning” than by privatization (Benkler 2017). Others take this position as well. Lessig, for example, uses music mashups to illustrate how open access stimulates creativity while privatized intellectual property can stifle it; and Michael Heller and Rebecca Eisenberg argue that overmuch propertization of scientific research can lead to a proliferation of minute claims, creating an “anticommons” that inhibits further research (Heller & Eisenberg 1998; Lessig 2004). The underlying argument is that an open access commons in intellectual endeavors invites participation and can have the same network effects that roads, waterways and public squares have, increasing productivity among artists and scientists instead of discouraging it.

As I mentioned above, Elinor Ostrom herself in her later career became very interested in the ways that the organization of common property regimes might apply to a commons in information, and her work has been much cited in connection with arguments against the extension of legal or technological “propertization” of intellectual achievements (Hess & Ostrom 2003). But as Benkler has stressed, the commons as open access in knowledge and information is much more radical than the types of community-based commons regimes that have been the standard fare of commons scholarship since Ostrom’s *Governing the Commons* (Benkler 2004, 296 note 77; Benkler 2013, 1505–1517).

My sense is that this radical difference between open access and limited commons is not typically observed in the “copyleft” literature. The limited commons is a recognizable version of a bounded and exclusive *property*, even if the boundaries encompass an entire community rather than a single individual. Ostrom’s own design principles stressed the importance of boundedness for the successful governance of a common pool resource; as I have described these community-based common property regimes, they are commons on the inside, but property on the outside (Rose 1998).

Moreover, despite some overlapping characteristics in these two different types of commons regimes, commons-as-open-access can be profoundly disruptive to commons-as-community-based-management. Jamie Boyle, one of the leaders in the copyleft movement, has railed rhetorically against propertization of intellectual achievements as another version of the enclosure of the commons in early modern England (Boyle 2003). But what that analogy misses is that the early modern commons was itself a property arrangement exclusive to the community that used it. On the other hand, the development of an open access commons—an infrastructure of roadways and water transportation—actually doomed the traditional commons. New possibilities for transportation and trade excited the interest of entrepreneurs in enclosing the limited, community-based commons, and in transforming what had been community common spaces into privately-owned grass monocultures, suitable for grazing sheep that would provide wool in international trade. Thus, the advent of an open-access commons—a new transportation infrastructure—was the essential precondition to the destruction of the community-based commons. More specifically, the awful truth is that the open access commons in transportation was also the precondition to the enclosure and privatization of the former community-based commons.

All this leads to questions about what kind of commons the anti-propertization IP scholars have in mind. Is it the limited commons that is commons on the inside, for members of the relevant group, but property

<sup>4</sup> The phrase “network effects” was not yet in widespread use, or at least I did not know it. If I had, I would have used it.

on the outside with respect to non-members? Or is it a genuine free-for-all, with open access common to all comers? Berkeley professor Robert Merges points out that many scientific advances occur among groups of scientists, who share information and methods among themselves while very much resisting the encroachment of outsiders—particularly outsiders who wish to monetize the scientists' work through exclusive intellectual property (Merges 1996). Others have argued that a kind of limited commons of group collaboration is at the heart of intellectual achievements more generally. Shakespeare, after all, needed the collaboration of the whole Globe Theater company (Keller 1986, 908).

There is no doubt much truth to the argument that scientific and artistic innovation is never so individualistic as perhaps we would like to think; this argument even suggests that the ideal intellectual commons really does overlap with the more traditional limited commons that is at the center of much literature on commons. On the other hand, just as the traditional community-based commons institutions have been criticized for stagnation and hierarchy, closed intellectual communities too have raised similar concern, particularly that they may be hostile to sharply innovative ideas. There is a history here; for example, in the eighteenth century, the clubby group of astronomical experts had nothing but contempt for the watchmaker whose clocks actually solved the problem of finding longitude at sea (Sobel 1995). More recently, grant-giving committees for medical research have been accused of prejudicial rejections of unconventional approaches to such difficult diseases as Alzheimer's (Begley 2018). One might speculate that a major task of innovation policy is to encourage both types of intellectual achievement: incremental improvements on the one hand, which may occur in limited commons of researchers and thinkers; and major breakthroughs on the other, which may sometimes require more open access—or possibly, as in the case of the enclosure movement, private property in the results, perhaps in the form of copyright and patent, at least in sharply innovative creations (Rose 2014, 13).<sup>5</sup>

In connection with knowledge and intellectual achievement, both types of commons—limited and open access—present issues of governance. The limited commons of group production is frequently governed by informal internal norms. The critical issue for such norms concerns openness to experience and information from nonconforming sources, whether inside the group or outside. The open access commons, on the other hand, requires some sort of governance simply to get anything done at all. Sometimes norms may suffice here too, as they did on with nineteenth century American travelers in physical space when they had to get around deep mud holes in the roadway: the widely understood norm was that trespass would be allowed, but that trespassers could cause only the most minimal possible damage to the adjacent land (Rose 1986, 744–745). With respect to the modern knowledge commons, as Yochai Benkler has pointed out, even Wikipedia requires rules (Benkler 2013, 1553–1555). The same may be said for citizen science, where in order to be useful, volunteer participants require some kind of uniform central data collection for reporting their counts of stars, measures of rainfall, or dates of the first flower blossoms.

A particularly acute example of the need for governance in open access knowledge platforms has emerged just within the last few years: the policing of malicious participation on the internet. “Fake news” and “trolling” currently roil the systems for political participation in democratic governments. The dream of our giant open access social media platforms has been a kind of Habermasian platform of unconstrained ideal speech. As it turns out, that is the nightmare too, and this open access commons still awaits a catechism for “Governing the Commons.”

## Conclusion: Some Topics for Further Exploration

The study of the commons in the last few decades has taken some unexpected twists and turns that I have not discussed or have only mentioned very briefly. For example, Henry Smith's work on the “semicommons” suggests that the traditional commons—the common fields of England—were not only highly governed by internal norms, but were also subject to private property claims of which the participants were acutely aware (Smith 2000). Elinor Ostrom denied that governing the commons required either Leviathan or private property, as Hardin posited, but in effect Smith's work highlights the point that the traditional commons themselves actually were a combination of Leviathan and private property, albeit on a small scale.

Both Hardin and Ostrom thus recognized that common pool resources could fall into tragedy but that they could also be governed in some way. But how does this happen? Some years ago, James Krier very forcefully pointed out that governance of the commons is what he calls *The Tragedy of the Commons, Part Two*. That is

<sup>5</sup> This is not to say that IP law is perfect—far from it, copyright is too long, and patents may unduly encourage opportunistic “trolls”. (See: Breyer dissenting in *Eldred v. Ashcroft*, 537 U.S. 136, 242, 254; Segal 2013, BU 1)

to say, the creation of a governance system is a secondary commons or secondary collective action problem itself, with all the incentives to shirk from participation and take the benefits without contributing (1992).<sup>6</sup>

One important issue for further inquiry is the question whether it might be easier to solve the secondary collective action problem – in the creation and maintenance of governance of common pool resources– than it is to solve the primary collective action problem in resource use itself. After all, creating rules for the use of the commons could be a less heated matter than attempting to stop overuse directly when there are no rules. Henry Smith's work on the semicommons suggests that this may be the case. He notes that at the outset of the English common field system, medieval agriculturalists actually came to deliberate agreements among themselves to hold their fields in common (Smith 2000). That is, they saw the advantage of creating a commons and created a governance structure in advance of actually using the common resource. On the other hand, Gary Libecap, writing about a much more modern issue—large underground oil and gas reservoirs—has argued that a highly efficient way to exploit this resource would be through “unitization” rules governing the ground-level landowners, to prevent their excessive drilling and overcapitalization of infrastructure as individuals. But his research shows that in practice, landowners can only create these rules behind a kind of veil of ignorance, when the participants do not know how much of the oil and gas reserve underlies their individual properties. Once they know they have accessible oil, they do not want to share it through unitization. But if they are still at a point where they do not know about the reservoir, no one knows enough about the resource to bother to figure out how to manage it (Libecap, 1989, 93–114).

The oil reservoir problem is very closely related to another commons or collective action problem: how do we know when we have a common pool question? This question is especially acute in environmental fields. The depletion or pollution of the resource may occur before we even notice. And if a resource really is a common, open to many others, it does not pay any individual to invest in learning about its degradation or considering potential recovery methods. Learning is just another form of investment, and unlike the case with privately-owned property, investing in learning about common resources tends to be weak, because others are likely to share the results of increased knowledge of the common resource. Hence *learning* about commons problems—especially large-scale commons—replicates the problem of the commons itself. This is one reason why environmental issues so often catch us by surprise; we only discern them after they become acute, because we had insufficient motivation to pay attention to them earlier (Rose 2014). Further investigation of the learning issue, however, may come up with some refinements; for example, some common pool issues may be more easily observed than others—forestry depletion, for example, by comparison with overloading the air with carbon dioxide. Research into this question may assist in concentrating on investing in learning about the most acute and difficult commons issues.

Another area for potential research derives from the observation made several decades ago by Russell Hardin (no relation to Garrett): that the tragedy of the commons is really a prisoners' dilemma (PD) writ large—an “n-person PD,” as he called it (1971). This is now a widely-accepted view. But here one might well ask about whether and in what ways the larger PD (or tragedy) might differ from the conventional two-person PD. Are the issues of distrust between two potential trading partners really similar to those among nations attempting to agree on the mitigation of greenhouse gases? In the latter case, is distrust the major issue at all, rather than disagreements about the distribution of costs? (Rose 2018).

All these questions leave us with grist for the mill of further research. Garrett Hardin gave us the catchy phrase, “tragedy of the commons,” and a warning about the degradations of common resources; and Ostrom gave us the confidence that commons resources can be fruitfully studied and managed. Commons scholarship has moved far beyond both, but perhaps it is no surprise that current scholarship sounds with both near and distant echoes of both these pioneers—even on issues practically unknown at time of their writing.

## Competing Interests

The author has no competing interests to declare.

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<sup>6</sup> Ostrom was aware of the secondary commons problem, and although she did not discuss it as such, her Design Principles are effectively a set of tools to overcome it.

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