

# Lockeans against Labor Mixing

Brian Kogelmann

Abstract: The idea that labor mixing confers property in unowned resources is, for many, the very heart of the Lockean system of property. In this essay I shall argue that this common view is mistaken. Lockean theorists should reject labor mixing as the preferred method of first appropriation, and should adopt a different account of first appropriation instead. This is because labor mixing does not serve the central justification for the institution of property embraced by Lockeans. Thus, my argument is internal to the Lockean system; I rely only on premises that (many) Lockean theorists embrace. Though Lockeans should forsake labor mixing, that does not mean they should give up on property rights and the idea of first appropriation. In the paper's final section, I sketch an account of first appropriation that Lockeans should embrace.

Keywords: Locke; first appropriation; original appropriation; property; property rights; labor mixing; rent dissipation; homestead.

## 1. Introduction

John Locke begins chapter five of the *Second Treatise of Government* with a puzzle: God gave to mankind the whole earth in common, yet individuals own things. How is this possible? Locke responds that persons acquire property by mixing their labor with unowned resources lying in common: "Whatsoever then he removes out of the state that nature hath provided... he hath mixed his labour with, and joined to it something that is his own, and thereby makes it his

property” (Locke 1980: 19).<sup>1</sup> The idea that labor mixing confers property in unowned resources is, for many, the very heart of the Lockean system of property.<sup>2</sup> In this essay I shall argue that this common view is mistaken. Lockean theorists should reject labor mixing as the preferred method of first appropriation, and should adopt a different account of first appropriation instead. My argument is internal to the Lockean system. I rely only on premises that many, but not all, Lockean theorists embrace.

Here is the structure of my argument. In the next section I delve into the question of how one determines what sorts of acts should count as instances of original appropriation (§2). Following the work of Bas van der Vossen, I argue that what counts as first appropriation should be determined in light of one’s general rationale in defense of the institution of property. That is, original appropriation should consist of a “natural act” facilitating the goals articulated in one’s overarching theory of property. Locke himself, and many Lockean followers, justify the institution of property by appealing to property’s positive economic impact: property rights encourage persons to use their resources productively, which results in greater wealth and prosperity for all (§3). At first blush, labor mixing seems to be a natural act facilitating the goal of creating greater wealth and prosperity. After all, laboring (according to Locke) is what creates value in the first place.

Laboring does create value, but only in some cases. Sometimes, laboring on objects decreases value; other times, laboring is applied to objects in deeply inefficient ways. In fact, I

---

<sup>1</sup> For Locke, it need not be that Althea does the laboring herself to gain a property right. Someone else can do the laboring for her, so long as Althea owns the rights to this labor. Locke writes: “Thus the grass my horse has bit; the turfs my servant has cut... where I have a right to them in common with others, become my *property*, without the assignation or consent of any body. The *labour* that was mine, removing them out of that common state they were in, hath *fixed my property* in them” (Locke 1980: 19-20).

<sup>2</sup> Of course, labor mixing is not sufficient to generate a property right. Locke and his followers place further provisos on first appropriation that must be satisfied for one to acquire property. I discuss these provisos below, in §5 specifically.

argue that a system that bestows property rights through labor mixing is one that *encourages* persons, in many cases, to mix their labor in unproductive or inefficient ways (§4). If I am right about this, then labor mixing is no longer a good candidate for conferring property, as it does not always serve the ends articulated in the wider Lockean theory of property. To argue for this conclusion, I rely on both theoretical and empirical work from economics showing that a system of labor mixing can lead to land rushes, which can encourage persons to settle land before it has net positive value, and also encourage them to make inefficient investments in the land.<sup>3</sup> Both activities destroy wealth. By implication, Lockeans (by their own premises) should reject the labor mixing account of first appropriation.<sup>4</sup>

After considering how Lockeans might respond to my argument (§5), I end by sketching an account of first appropriation that Lockeans should embrace (§6). The basic idea is that taking seriously the Lockean's justification in defense of the institution of property demands we give up on general appropriation rules that apply universally. Instead, appropriation rules must be decided on a case-by-case basis, always tailored to local conditions and communities. Such an account of first appropriation, I argue, will better serve the Lockean's wider theory of property, at least when compared to labor mixing.

---

<sup>3</sup> In doing so, this paper contributes to a growing literature that analyzes Locke's political theory using the tools of modern economics (e.g., Kogelmann and Ogden 2018; Barrett 2020; Bruner 2020; Chung 2020; Van der Vossen forthcoming).

<sup>4</sup> Technically, the scope of my argument is more expansive than this. There are many who justify private property by appealing to property's positive economic impact, who are not Lockeans (Adam Smith and David Hume, for instance). My argument shows that they must also reject the labor mixing theory of first appropriation. This is less interesting a conclusion, though, because they do not explicitly embrace labor mixing. I focus on Locke and Lockeans in particular, because they *both* justify property by appealing to its positive economic impact *and* embrace the labor mixing account of first appropriation. I show that these two commitments (both embraced by many Lockeans) are inconsistent.

## 2. What Counts as Original Appropriation?

Locke and his followers hold that property in unowned resource  $x$  is acquired when a person mixes her labor with  $x$ . A natural question arises: why is labor mixing what confers property in  $x$ ? Why not some other activity? To answer this question, we need to take a step back and answer a more fundamental question first: how do we determine what sorts of activities count as original appropriation in the first place? Answering this question will allow us to see why the Lockean insists on labor mixing. I answer this question in the current section, following the work of Bas van der Vossen.

Van der Vossen begins by noting that a theory of property consists of two components (Van der Vossen 2009: 360). First, the theory must provide an account of why property rights are morally justified at all. This is the *justification element* of a theory of property. And second, the theory must provide a way of determining the legitimacy of the particular holdings of individuals at any given slice of time. This is the *individuation element* of a theory of property. Let us examine both elements in more detail.

The justification element of a theory of property tells us why property rights are justified at all. Any system of property inherently limits persons' liberty. Because I have property in my laptop, you are not at liberty to use it. Because you have property in your house, I am not at liberty to use it. The restrictions inherent in a system of property cry out in need of justification. Fortunately, many options are available. Some point to property's desirable social benefits, in particular property's role in economic growth (e.g., Nozick 1974: 177). Justifying property need not be consequentialist, however. Others argue that property is essential for individual autonomy. If persons are to formulate and execute complex life plans, then they need ownership of certain resources, and stability in their possession of these resources (e.g., Lomasky 1987). Others have

argued that property allows persons to exercise their two moral powers, understood in Rawls's sense (e.g., Tomasi 2012: 68-84).

A theory of property's justification element provides an overarching defense of the institution of property. It tells us why we can permissibly implement an institution that restricts persons' liberty. It cannot tell us, though, whether the property holdings of any specific individual are legitimate. It cannot tell us, for instance, whether Althea's property in object  $x$  is a legitimate holding or not. This is why every theory of property must also have an individuation element. The individuation element offers criteria for determining whether individual property holdings are legitimate. We should be able to use these criteria, coupled with facts about Althea's property in object  $x$  (what object  $x$  is, how she acquired  $x$ , and so on), to determine whether her holding of  $x$  is legitimate.

Most property is acquired through transfer from one person to another. So, a theory of property's individuation element must offer criteria for determining what counts as a legitimate transfer. Is a transfer based on fraud legitimate? What about when there are extreme bargaining asymmetries between trading partners? There are a range of reasonable answers to these sorts of questions, but the point is that any theory of property must take a stand on them, and will do so through its individuation element. Most property is acquired through transfer, but property must start somewhere. Therefore, a theory of property's individuation element must also offer an account of original appropriation. It must tell us when Althea's appropriation of unowned resource  $x$  is legitimate and when it is not.

Van der Vossen's central point is that, within a theory of property, there is a certain priority among the justification and individuation elements. The justification element is developed first, followed by the individuation element. This is not merely a point about the

temporal sequence one goes through when developing a theory of property. Van der Vossen's more fundamental point is that one must develop the justification element first because the individuation element should be developed *in light of the justification element*. Putting aside the question of legitimate transfers, this means that the property theorist develops an account of first appropriation in light of the overarching justification she has already offered in defense of the institution of property. In other words: determining what counts as first appropriation requires we appeal to why property is important and valuable in the first place.

How does one do this? First, one's theory of appropriation must be consistent with one's overarching theory of property. Writes Van der Vossen: "So what acts can count as original appropriation? In principle, the role could be fulfilled by any type of act consistent with the wider theory of property rights" (Van der Vossen 2009: 362). What would it mean for a theory of first appropriation to be inconsistent with a theory of property's justification element? Van der Vossen does not offer an example, but let me try. Suppose one develops an overarching theory of property whose goal is to ensure an egalitarian distribution of natural resources. An account of first appropriation allowing persons to appropriate an unlimited amount of natural resources seems inconsistent with the more general theory of property. In other words, the individuation element seems inconsistent with the justification element. This is because allowing for unlimited appropriation will almost surely result in unequal ownership of the natural world, yet property is justified precisely to ensure that all persons control an equal share of worldly resources.<sup>5</sup> To be

---

<sup>5</sup> One could imagine a system where individuals can appropriate an unlimited amount, but will then owe taxes on whatever they take beyond their equal share; resources collected through taxation will then be redistributed to those who appropriated less than their equal share. This is similar to the system Steiner (1994: 235-236) proposes. This system of first appropriation is plausibly consistent with the goal of achieving an egalitarian distribution of natural resources (unlike the one proposed above, where unlimited appropriation is allowed, and no taxation is collected).

consistent with the wider theory of property, a different account of first appropriation must be adopted.

If a theory of property's individuation element must merely be consistent with its justification element, then there is considerable latitude for determining what counts as first appropriation. Few theories of original appropriation will literally be inconsistent with an overarching justification in defense of the institution of property (in fact, I am not even convinced that the example I gave above is a true case of inconsistency). Fortunately, Van der Vossen tells us that "the account of original appropriation can be filled out further in light of the general justification offered. The first thing to note is that there clearly will be better and worse candidates for such acts" (Van der Vossen 2009: 363). To place further constraints on how a theory of property's individuation element can be permissibly fleshed out, Van der Vossen appeals to the idea of a "natural act" of appropriation. In Van der Vossen's words: "A 'natural' act of appropriation is an act that is an extension of the rationale of the wider theory of justified property rights. It will be the kind of act by which one begins to satisfy the general conditions for justified ownership" (Van der Vossen 2009: 364).

Let me offer an example to try and explain what Van der Vossen is getting at. Suppose one's overarching justification in defense of the institution of property is that property rights encourage individuals to use resources productively, thereby resulting in economic growth. Now imagine the following account of first appropriation: parcels of unowned land are allocated to persons on the basis of age, where the oldest person gets first pick. This system of first appropriation is not inconsistent per se with the goal of encouraging individuals to use resources productively. Certainly, however, it does not seem like a natural act of appropriation, given our justification element. Unless we knew for a fact that older people will be more productive with

their resources than the young, why think such as system will serve the ends articulated in our more general theory of property?

Our guiding question for this section has been: how do we determine what sorts of activities count as original appropriation? We now have an answer. In developing a theory of property, one first specifies the justification element. The justification element offers an overarching rationale for the institution of property. After one specifies the justification element, one must then specify the individuation element. Here is where an account of original appropriation is developed. The account of original appropriation must first be consistent with the rationale for property articulated in the justification element. Beyond this, original appropriation should consist of a natural act facilitating the goals articulated in the overarching theory of property.

### 3. Why Labor Mixing?

We can now return to the question: why, according to the Lockean, is labor mixing what confers property in unowned objects? From the last section we know the answer must be because labor mixing counts as a natural act of appropriation when measured against the Lockean theorist's justification for the institution of property. Whatever the rationale behind the institution of property, labor mixing must facilitate this goal. So, to answer the question "Why labor mixing?", we need to know more about the Lockean theorist's defense of property. To use Van der Vossen's terminology: to understand the Lockean theorist's individuation element, we must first unpack their justification element.



So why, according to the Lockean theorist, is the institution of property justified in the first place? This is something Lockeans disagree about. In this paper I will focus my attention exclusively on one line of argument (without defending this line of argument) found in Locke and also many of those who follow in his footsteps. Throughout chapter five of the *Second Treatise*, Locke emphasizes the positive economic impact that follows from the institution of property. In particular, property encourages persons to use resources productively, which leads to economic growth and greater prosperity for all. Consider the following passage:

To which let me add, that he who appropriates land to himself by his labour, does not lessen, but increase the common stock of mankind: for the provisions serving to the support of human life, produced by one acre of inclosed and cultivated land, are (to speak much within compass) ten times more than those which are yielded by an acre of land of an equal richness lying waste in common. And therefore he that incloses land, and has a greater plenty of the conveniences of life from ten acres, than he could have from an hundred left to nature, may truly be said to give ninety acres to mankind: for his labour now supplies him with provisions out of ten acres, which were but the product of an hundred lying in common (Locke 1980: 23-24).

The basic idea here is simple. Granting Althea property in resource  $x$  encourages her to use  $x$  productively. This productivity leads to growth, which benefits everyone. Indeed, if Althea has property in ten acres, her productive use of it creates more value than 100 acres lying in common. All this value does not accrue strictly to Althea, because she now uses only 10 acres to acquire the same benefit that she would otherwise get from 100 acres. Hence, property in 10 acres allows her to “give ninety acres” to the rest of humankind.

Locke thus seems to offer the following justification in defense of the institution of property: property encourages persons to use resources productively, which leads to economic growth and greater prosperity for all. It is worth noting that the empirical claim implicit in this justification – that property rights lead to economic growth which makes everyone wealthier – is supported by both theoretical and empirical work in economics (e.g., Acemoglu *et al* 2001; Acemoglu and Johnson 2005; Acemoglu and Robinson 2012).

Of course, an appeal to positive economic impact was not Locke’s only justification for the institution of property. Another Lockean defense of private property is grounded in individual self-ownership, and the way in which ownership transfers from individuals to objects. Here is a brief sketch. Individuals own themselves. From this, Locke claims, it follows that individuals have ownership over their labor: “The *labour* of his body, and the *work* of his hands, we may say, are properly his” (Locke 1980: 19). When an individual “annexes” their labor (which they have ownership over) to an unowned object, they then transfer ownership to this unowned object: “for this *labour* being the unquestionable property of the labourer, no man can have a right to what that is once joined to” (Locke 1980: 19). To be sure, there is much that is mysterious in this argument, and compelling criticisms have been leveled against it (e.g., Moller 2019). The point, however, is that an appeal to positive economic impact was not Locke’s only justification for the institution of property. Nonetheless, a major consideration justifying private property, for Locke, was property’s positive impact on economic growth. It is this particular justification that I will be interested in for the purposes of this paper, though I interpret the results of my argument in §5 below in terms of this more complicated, multi-faceted justification.

Many of Locke's followers read him as justifying property rights by appealing to property's positive economic impact. Van der Vossen is one such person. On his reading, Locke "gave us a number of considerations that can be seen as forming a general justification of the practice of having property rights. These considerations stress the beneficial effects of the possibility of property rights in terms of how much there is for persons to own" (Van der Vossen 2009: 365). A. John Simmons also reads Locke as justifying the institution of property by appeal to property's positive economic impact. Simmons finds in Locke "a rule-consequentialist argument to the conclusion that laborers should have title to the specific products of their labor. For one good way of encouraging (inducing) labor is to reward the laborer with the title to the product, thereby (indirectly) encouraging the laborer to do what is best for all" (Simmons 1992: 248). Richard Epstein notes "a point that Locke clearly recognized" is that property leads to "increased wealth" which creates "additional opportunities for third persons to enter into win/win contracts of their own" (Epstein 1994: 22).<sup>6</sup>

David Schmidtz, a follower of Locke in many respects, writes that "in taking control of resources and thereby removing those particular resources from the stock of goods that can be acquired by original appropriation, people typically generate massive increases in the stock of goods that can be acquired by trade" (Schmidtz 2008: 196).<sup>7</sup> Robert Nozick, who was broadly inspired by the work of Locke, notes that private property "increases the social product by putting means of production in the hands of those who can use them most efficiently (profitably); experimentation is encouraged, because with separate persons controlling resources, there is no

---

<sup>6</sup> See also Epstein (2015: 1756-1757).

<sup>7</sup> See also Schmidtz (1990).

one person or small group whom someone with a new idea must convince to try it out,” and so on (Nozick 1974: 177).

So, Locke and many of his followers flesh out the justification element of their theories of property by appealing to the fact that property rights encourage productivity, which leads to economic growth and prosperity for all. Labor mixing, then, must be a natural act of appropriation when viewed in light of this justification. That is, the act of mixing one’s labor with an unowned resource must facilitate the end of using this resource productively and creating greater wealth and prosperity for all in the process. In fact, Locke explicitly draws a connection between laboring and the creation of value. He writes:

Nor is it so strange, as perhaps before consideration it may appear, that the *property of labour* should be able to over-balance the community of land: for it is *labour* indeed that *puts the difference of value* on every thing; and let any one consider what the difference is between an acre of land planted with tobacco and sugar, sown with wheat and barley, and an acre of the same land lying in common, without any husbandry on it, and he will find, that the improvement of *labour makes* the far greater part of the value. I think it will be but a very modest computation to say, that of the *products* of the earth useful to the life of man nine tenths are the *effects of labour*: nay, if we will right estimate things as they come to our use, and cast up the several expences about them, what in them is purely owing to *nature*, and what to *labour*, we shall find that in most of them ninety-nine hundredths are wholly to be put on the account of *labour* (Locke 1980: 25).

Locke’s point in this passage is that wealth is typically produced through persons laboring on objects. Wealth is produced when someone tills a field to plant a crop, when they dig precious minerals out of the ground, and when they clear a forest and build a town with the timber. These

are all acts of laboring. So, to answer our guiding question: since the central Lockean rationale behind property rights is to produce greater wealth, it seems natural to bestow property rights through the act that produces wealth in the first place. That act is laboring, which is why labor mixing counts as first appropriation, according to the Lockean.

How might one push back against this argument that links the Lockean justification for property and the labor mixing system of first appropriation? The first thing to note here is that not all laboring produces value. To cite an example offered by Nozick, spraying pink enamel paint on a piece of driftwood is an act of laboring, but it does not make the driftwood any more valuable (Nozick 1974: 175). It might even make it less valuable. Beyond this, some laboring produces value but not nearly as much value as could be created when compared to other acts of laboring. Flooding a field to create a lake is an act of laboring that may add some value to the land, but not as much as tilling the field and planting barley.

Of course, the mere possibility that laboring *might* result in the unproductive or suboptimal use of resources does not sever the link between the labor mixing theory of appropriation and the wider Lockean rationale for property. Cutting the link between the justification and individuation elements of the Lockean theory of property requires more than a mere possibility proof. However, what I will now argue is that a system where resources are appropriated according to labor mixing is one that *encourages* persons, in many cases, to mix their labor in unproductive or inefficient ways. If I am right about this, then labor mixing is no longer a good candidate for the Lockean theorist's individuation element, as its relationship to the justification element is far more tenuous. Given the wider rationale for the institution of property, the Lockean theorist should embrace a system of first appropriation that not only

encourages persons to mix their labor with resources, but encourages them to mix their labor *in a productive manner*. That system is not the labor mixing system, however.

#### 4. Labor Mixing and the Destruction of Value

Property in resource  $x$  establishes prime conditions for Althea to create wealth, as the property right allows her to exclude others from using  $x$  and also allows her to reap all the benefits from  $x$ 's use. This encourages her to use  $x$  productively. How property in object  $x$  is established, though, effects the total amount of value that can be extracted from it. Some ways of establishing property in  $x$  will diminish the value Althea can extract from it, at least when compared to the value that could be extracted from it in a world where property in  $x$  were established differently. Sometimes, quite literally all of  $x$ 's future value might be dissipated during its appropriation. Thus, if one's goal is to encourage the production of wealth (which, as we have seen, is the goal of many Lockeans), then it is not only important *that* one establishes rights of private property, but also *how* one establishes these rights.

Relevant here is the work of economists Terry L. Anderson and Peter J. Hill (1990).<sup>8</sup> The authors compare the efficiency properties of three different systems of first appropriation, all used in the United States at different points in time: "sale to the highest bidder, usually at a minimum price but without any requirement of residence on the land; preemption, which gave squatters first right to purchase the land at a minimum price; and homesteading, which provided free land to settlers provided they met certain improvement requirements" (Anderson and Hill

---

<sup>8</sup> See also Dennen (1977: 730); Anderson and Hill (1983); Haddock (1986); Bohanon and Coelho (1998); Anderson and Hill (2004: 168-174); Libecap (2007: 261); Murtazashvili (2013: 193).

1990: 178).<sup>9</sup> Though these different methods of first appropriation all aimed at the same goal – allowing persons to establish property rights in unowned resources – they had vastly different effects on the production of wealth.

The first method of original appropriation used in the early United States was sale to the highest bidder (with a price floor), where rights in land were established through auction. That is, private property in land was initially acquired through purchase from the federal government. Indeed, Alexander Hamilton thought that the sale of public land into private ownership was the best way of generating revenue to pay down the nation’s war debt (Gates 1976: 217). The second method used was preemption.<sup>10</sup> Here, private property was once again acquired through purchase, but not an auction system where all persons could freely enter bids. Instead, squatters were given first opportunity to purchase the land they were currently residing on, at a set price. If the squatter did not purchase the land, then it was auctioned off.

The third and final method of original appropriation used in the early United States (and the one most relevant for our purposes) was homesteading. Initiated by the Homestead Act of 1862, the basics of the law were as follows: contingent on paying a \$10 registration fee, persons could gain property in 160 acres of unowned land by simply residing on it for five years and cultivating it (Allen 1991: 8). Homesteading resembled quite closely the labor mixing system of first appropriation. In particular, the requirement that persons live on and cultivate land for five years in order to gain a property right is quite similar to the idea that property in land is acquired through labor mixing. This is clear if we take a closer look at what the cultivation requirement

---

<sup>9</sup> One might think that purchasing land does not count as a system of first appropriation, because purchasing land implies that the land is already owned. I discuss this in §6 below.

<sup>10</sup> Preemption is similar to what some call “first possession” (e.g., Rose 1985) and what others call “finders-keepers” (e.g., Kirzner 2016).

consisted of: “Cultivation of the land for a period of at least two years is required, and this must generally consist of actual breaking of the soil, followed by planting, sowing of seed, and tillage for a crop other than native grasses” (Department of the Interior 1926: 10). Moreover, “during the second year not less than one-sixteenth of the area entered must be actually cultivated, and during the third year, *and until final proof*, cultivation of not less than one-eighth must be had” (Department of the Interior 1926: 10). Such requirements seem largely in the spirit of the Lockean system of first appropriation.

In the early history of the United States, we thus find three different methods of first appropriation, but these methods were not equal in their ability to produce wealth. In particular, both preemption and homesteading incentivized a race to establish rights, which dissipated the total amount of value that could have been extracted from the land. To see why, note first that the value of occupying land can at times be net negative. It is costly to build a home and fend off invaders. These costs can be greater than the value one extracts from the land itself. Not only this, but there is an opportunity cost involved when it comes to occupying land. For example, even if one manages to extract positive value from the land, one could perhaps earn more doing something else, such as working in a factory. If this is the case, then the efficient thing to do would be to work in the factory, not farm the land.

Of course, just because land may harbor net negative value now, it doesn't follow that things will always be this way. Technological changes can lead to greater productivity, allowing individuals to extract more value from their land. So can shifting population dynamics. Whether it is profitable to grow wheat in Kansas depends on how many people are in Kansas (especially when the costs of transporting one's wheat are high). The point here is that, though settling land may have net negative value now, things may change in the future. There is probably net



negative value in settling parts of Siberia right now, but this might not be the case after 500 years of climate change. In these sorts of cases, the efficient thing to do is settle a piece of land only when you can extract net positive value from it. Until one can extract net positive value from the land, one's time and efforts are better spent elsewhere.

The problem is that both preemption and homesteading as methods of first appropriation encourage persons to settle land *before* they can extract net positive value from it, because land in both systems is allocated on a first-come-first-serve basis. In the case of preemption, those occupying the land get the first opportunity to buy it, so it pays to be first. And in the case of homesteading, those who cultivate (i.e., mix their labor with) the land receive the property right, so once again it pays to be first. Even when the value of settling land is net negative, both systems encourage persons to settle the land anyways. The loss incurred during this initial settlement offsets much of the value that can be extracted from the land later on. In some cases, all future value is dissipated. As Anderson and Hill describe it: "Premature settlement forces production prior to the time when annual rents are positive" (Anderson and Hill 1990: 189). To put it another way: "...land was not free since competition for rents encouraged premature settlement... the resulting premature development of the frontier created a drain on national income" (Anderson and Hill 1990: 191).

When land has net negative value, both preemption and homesteading encourage persons to settle the land anyways, which reduces the value that can be extracted from the land later on. Homesteading, however, can lead to even greater destruction of value than preemption, making it the most inefficient of our three systems of first appropriation. This is because homesteading can not only encourage persons to settle land too early, but it can *also* encourage them to modify the land in inappropriate ways. In particular, if property is acquired through labor mixing, then

persons will mix their labor with the land *even when doing so is not productive*, further destroying wealth. Note Anderson and Hill: "...the [homesteading] acts required unnecessary investments, such as irrigation ditches, that would not otherwise have been built; trees planted where they would not grow; and soil plowed for farming that was better suited for grazing" (Anderson and Hill 1990: 189-190). If the overall goal is to produce wealth, then a system that encourages persons to dig unnecessary irrigation ditches or plant unnecessary trees is probably not the best possible system.<sup>11</sup> Preemption did not have this problem because squatting on land did not require that one cultivate it. And those who purchased land through auction did not have to occupy or cultivate the land at all.

Inefficient investment encouraged by the homesteading (i.e., labor mixing) system had a massive and negative impact on economic development. These negative effects are still with us today. In a recent paper, economists Douglass W. Allen and Bryan Leonard show that land plots homesteaded are poorer and less developed today when compared to similar plots that were acquired through purchase. They write: "We compare lands acquired through cash sales over 1862-1940 to nearby lands with similar characteristics that were simultaneously acquired by fulfilling the occupancy and use requirements of the Homestead Act (1862), and find that homesteads are substantially less developed in 2012" (Allen and Leonard 2020: 2). Stunningly, this applies even when the *same individual* owned both a plot bought through cash sales and one acquired through homesteading. In these cases, the purchased plot is more developed and worth more today when compared to the homesteaded one, even though the same person owned both plots. Another recent empirical paper reports similar findings. Ross Mattheis and Itzhak Tzachi

---

<sup>11</sup> It might be thought that the Homestead Act could have avoided these problems by requiring that persons not only cultivate the land, but do so in a productive manner. Of course, legislating what counts as a productive improvement *ex ante* is an extraordinarily difficult task.

Raz find that “areas with greater historical exposure to homesteading are poorer and more rural today” (Mattheis and Raz 2019). So, the damage encouraged by the United States’ labor mixing system was not minor. Though the system was primarily used in the late 1800’s and early 1900’s, its destructive legacy is still with us today.

To be clear, the work in economics I have just overviewed does not say that a labor mixing system will *always* dissipate future value that can be extracted from the land. In some cases, occupying and working the land right now has net positive value. In these cases, no wealth is destroyed by racing for rights and tilling the soil. However, there is a large set of cases (much of the Western United States in the late 1800’s and early 1900’s, for instance) where labor mixing destroys wealth by dissipating future value that can be extracted from the land. In these cases, persons have an incentive to occupy land before they can extract net positive value from it. They also have incentive to modify the land when it is best to leave the land untouched. When this happens, labor mixing destroys wealth.

This has been a long section, but the point I am trying to make is a simple one. If the goal of a system of property is to encourage the production of wealth (which, we have seen, is the goal of many Lockeans), then labor mixing will not always be a natural act of appropriation. Labor mixing will not always be a natural act of appropriation because in many cases it does not serve the goal of the overarching system of property. In many cases, labor mixing does not encourage the production of wealth, but rather encourages its destruction. Thus, Lockeans who justify property by appeal to its positive economic impact should not embrace labor mixing as a universal system of first appropriation.

## 5. Objections

In the prior section, I argued that Lockeans who justify property rights by appealing to their positive impact on economic growth should not embrace labor mixing as a universal system of first appropriation. This is because labor mixing will, in many cases, encourage persons to use resources in an unproductive manner. As a result, labor mixing is not a natural act of appropriation. There are several ways the Lockean might respond to my argument. I consider three of these objections in the current section.

First, one might argue that Locke's provisos on appropriation prevent the kind of unproductive resource use that I am concerned with. The famous enough-and-as-good proviso does not seem relevant, because this restricts *how much* persons may appropriate, whereas I am concerned with *what people do* with what they appropriate (Locke 1980: 21). Locke's spoilage proviso also seems irrelevant, as this applies to goods that are capable of spoiling – it prevents persons from picking too many apples and then letting them rot, or killing too many deer and then letting the meat go foul (Locke 1980: 20-21).

Locke's third proviso says that persons may only take "*as much land* as a man tills, plants, improves, cultivates, and can use the product of" (Locke 1980: 21). A natural reading of this proviso does not seem to prevent the conduct I am concerned with. Homesteaders *did* till, plant, improve, and cultivate the land they settled. In fact, tilling, planting, improving, and cultivating was necessary to gain a property right. The problem was not that homesteaders did nothing with the land (which seems to be what Locke wishes to prevent with this proviso). The problem was that homesteaders settled the land before they could extract net positive value from it (thus dissipating the future value they could extract from it), and cultivated the land in deeply inefficient ways (further dissipating the future value they could extract from it). From a productivity perspective, it would have been better if persons could acquire property in land, let

it lie untouched and uninhabited, and then settle and cultivate the land at a later date, only when net positive value could be extracted from it. This, though, seems to conflict with the proviso currently under consideration. So, not only does Locke's third proviso not prohibit the behavior I am concerned with, but it might actually *encourage* it.

A second objection points out that Locke and some Lockean do not only justify the institution of property by appealing to its positive economic impact, but rely on other considerations as well (for instance, the self-ownership argument I briefly covered in §3 above). These other justifications of property can vindicate labor mixing as a natural act of appropriation, *even when* labor mixing results in unproductive resource use. This is a compelling objection to my argument, so let's consider it carefully. We can split Lockean theorists into three different groups: those who justify property *exclusively* by appealing to property's positive economic impact (group I), those who justify property *exclusively* through some other argument, such as the self-ownership argument (group II), and those who offer a *mixed* justification for property, by appealing to property's positive economic impact *as well as* other considerations, such as the self-ownership argument (group III).

Lockeans in group II will be unbothered by my argument, but this is no surprise, as I stated up front (in §3 above) that I focus my attention on one (and only one) prominent justification for the institution of property found in the Lockean literature. Lockeans in group I, I have shown, must abandon the labor mixing system of first appropriation. The interesting question is what my argument says for those in group III, which plausibly contains Locke himself. I am not sure whether my argument shows that the group III Lockean must immediately abandon labor mixing as a system of first appropriation. My argument does reveal, however, an incoherence within the group III Lockean's theory of property that must be addressed.

The group III Lockean includes at least two components in her justification element, property's positive economic impact being just one of these. In a happy world, these distinct justifications would all agree that labor mixing is a natural act of appropriation. If labor mixing always resulted in productive resource use, then this happy world would be the actual world (assuming the other components of the justification element also point to labor mixing as a natural act of appropriation). However, I showed in the last section that this is not so. For the group III Lockean, my argument shows that different components of her justification element point to different appropriation rules as natural acts of appropriation. That is, the group III Lockean's complex justification element points to different and conflicting individuation elements. The self-ownership argument might point to labor mixing as a natural act of appropriation, while the appeal to economic growth points in a quite different direction. I do not know how this tension should be resolved, but it is a tension that my argument has at least brought to light, and one the group III Lockean must address.

A third objection runs as follows: though the labor mixing system is not maximally productive, it does still result in *some* productivity. Even though homesteaders dissipated future value that could later be extracted from the land they occupied and cultivated, most of them did extract some net positive value from the land when all was said and done; they just did not extract nearly as much value as they could have extracted were a different appropriation rule used. Perhaps, then, labor mixing is *productive enough* to count as a natural act of appropriation when measured against the Lockean's justification element. This is a compelling objection, so it must be dealt with carefully.

To begin, consider what I take to be a relatively uncontroversial principle: unless there is a compelling reason to insist otherwise, if the reason you embrace property rights is to encourage

the production of wealth, then you should adopt the system of property that is likely to produce the most wealth. Note, this principle does not say that the Lockean *must* embrace the system of property that produces the most wealth. It merely establishes a presumption in favor of this system. Of course, the presumption (like all presumptions) can be overcome. If there is a compelling reason to the contrary, then the Lockean may deviate from the system of property that produces the most wealth. If this principle is accepted (and I think that it should be accepted), then the objection raised in the paragraph above fails *unless* a compelling reason can be given to reject the system of property that is likely to produce the most wealth. Why might the Lockean reject such a system?

Here is one reason: it would be far too demanding on individuals. Individuals would be required to put the resources they have property over to their most productive use. If they did not, then they are liable to lose their property. This would make property rights far too unstable. Moreover, such a system presents deep epistemic challenges. Suppose Althea, with her property, decides to plant a field of barley. Is this the most productive thing she can do with her land? It's hard to say. Perhaps planting corn or soybean would have produced more wealth. So, not only does the most productive system demand far too much of individuals, but it is also fraught with deep epistemic challenges.

These reasons for defeating the presumption in favor of the most productive system of property fail. The reason why is that such reasons misunderstand the distinction between justifying a game and justifying moves within a game (Schmidtz 2008: 198-200). Someone might argue that chess is the best game because it is the most intellectually challenging, but from this it does not follow that all moves within a chess match will challenge the intellect. In fact, this will surely not be so. For a rational player, the first few moves of the game are always the

same. Starting off the game by moving a pawn forward two spaces can hardly be said to challenge the intellect, but the claim was never that *every move* in the game of chess is intellectually challenging, but that the *game overall* is an intellectually challenging one.

Similarly, saying that the Lockean should choose the system of property that best encourages the production of wealth does not imply that every use of property within this system must be maximally productive. It just means that, when confronted with system of property A and system of property B, the Lockean should choose the system that is likely to result in greater productivity. Suppose this is system A, because the system incentivizes persons to use their resources in the most productive manner possible. Of course, some will not respond to these incentives (this will be true in any system of property). There will be persons in system A that do not use their resources in a maximally productive manner. In fact, some will use their resources in an unproductive manner. This, however, does not change the fact that, overall, system A encourages greater productivity than system B.

Hence, it is wrong to say that the most productive system of property demands that persons must always use their property in a maximally productive manner. Embracing a specific game does not commit one to the claim that all moves within the game must take on a certain character. One embraces a specific game because, overall, it encourages a certain kind of play, even if not every move within the game is played in the desired manner. Labor mixing, we have seen, encourages persons (in many cases) to use resources in an unproductive manner. The Lockean should reject this system, and embrace one that better encourages persons to use their resources productively. This does not mean that, in such an alternative system, all uses of property must be maximally productive. It merely means that persons in the alternative system



*tend* to use their resources more productively when compared to how persons use their resources in the labor mixing system.

## 6. Now What?

Labor mixing is a bad way of fleshing out the individuation element of the Lockean system of property, given the Lockean's justification element. For labor mixing, I have shown, is not a natural act of appropriation when measured against the normative goal of producing greater wealth, as it encourages persons, in many cases, to use their resources in an unproductive manner. In response, what account of first appropriation should the Lockean embrace? This final section sketches a tentative answer to this question.

Recall back to §4. Anderson and Hill examine three different methods of first appropriation (auctions, preemption, and homesteading) used in the early United States, but only two (preemption and homesteading) destroyed wealth. Auctioning off land to the highest bidder (if the auction is structured properly) does not dissipate future value that can be extracted from the land. The reason why is that purchasing land does not require persons to occupy the land (as preemption and homesteading do), nor does it require persons to cultivate the land (as homesteading does). Beyond this, economists also note that, when land is allocated through auction, it tends to end up in the hands of those who value it most, which will typically be those who know how to use it most productively (Libecap 2007: 262). Furthermore, prices generated through an auction provide information about the underlying qualities of the land (Libecap 2007: 262). One proposal, then, is that the Lockean should embrace an auctioning system of first appropriation. This would serve the normative goals articulated in the Lockean theorist's justification element, at least when compared to labor mixing.

There is a problem with the auctioning system of first appropriation. An auction presumes that some entity is in possession of  $x$ , who then sells it through an auction to a different entity. On the flipside, if no one is currently in possession of  $x$ , then  $x$  cannot be auctioned off. The problem here is that a system of first appropriation articulates how property in  $x$  is initially acquired. That is, Locke's theory is about how to acquire resources that are not owned by anyone. As such, auctioning cannot be used as a method of first appropriation, for no entity has the authority to auction off the relevant resources.

Since the auction theory is not a permissible candidate, what method of first appropriation should the Lockean embrace? To answer this, I want to take a step back and return to the settlement of the American West. At some points during Westward expansion, there was tremendous legal uncertainty concerning the acquisition of property. The details of various treaties and land purchases were still being worked out, and it was unclear if persons were allowed to acquire property, let alone how they were supposed to go about doing so (Murtazashvili 2013: 62). Not only this, but property rights (when it was clear if and how they could be acquired) were not always well protected by federal and local governments. Attacks from Native Americans and other settlers were a very real and very serious possibility (Murtazashvili 2013: 62). In the face of these challenges, how were property rights established and protected?

In many instances, those on the frontier who had an interest in acquiring property established *claim clubs*. Claim clubs were informal organizations that specified, enforced, and adjudicated the property claims of their members, oftentimes using coercive means to do so, though they were entities that existed outside the formal contours of the state (Murtazashvili 2013: 19). Claim clubs were joined on a voluntary, contractual basis. Indeed, they were actual

social contracts.<sup>12</sup> The basic idea behind claim clubs was to form organizations that could specify and enforce property rights in absence of the state.

According to political economist Ilia Murtazashvili, analysis of claim club constitutions reveals that all such constitutions share certain features in common. In particular, all claim clubs regulated the size of the claim persons could make; they established occupancy requirements that must be fulfilled in order for persons to gain a property right; they provided rules for trading claims; they specified how collective defense was to be provided; they contained political institutions for making collective decisions; they provided judicial institutions for settling disputes; and they contained democratic procedures for changing the constitution of the club (Murtazashvili 2013: 73).

Claim clubs were thus complex and sophisticated organizations that arose out of the need to solve a pressing social problem – the specification and enforcement of property rights in the absence of the state. Of particular interest for us are two features of claim club constitutions just mentioned: regulation of claim size and occupancy requirements. Together, these features of claim clubs constitute a theory of first appropriation, as they specified what individuals could permissibly claim, and what they had to do to claim it.

It is my contention that we can develop an account of first appropriation consistent with the normative goals of the Lockean theory of property by taking a close look at how claim clubs handled original appropriation. In particular, the rules issued by claim clubs are the best hope we have at finding appropriation rules that encourage persons to use their resources productively. Why is this the case? Why should we trust the efficiency properties of claim club appropriation

---

<sup>12</sup> For an overview of the structure of these contracts, see Murtazashvili (2013: 50).

rules? According to Anderson and Hill, we should trust the efficiency properties of claim club appropriation rules because the rules were formed by residual claimants. In other words, those who formed the rules had skin in the game. An appropriation rule that destroyed wealth would destroy *their* wealth, so the incentive was to form rules that discouraged the unproductive use of resources. As the authors write: “because members of land-claims clubs had a direct stake in the outcome, they had an incentive to develop an orderly process that minimized the expenditure of resources in establishing property rights. Defining and enforcing property rights took some effort, but to the extent possible the effort was focused on productivity” (Anderson and Hill 2004: 160).<sup>13</sup> More generally, “the important lesson, similar to that from the homestead acts, is that rules for establishing property rights are more likely to dissipate the value of the property if they are dictated by individuals or groups without a direct stake in the outcome” (Anderson and Hill 2004: 174).

This is not to say that local appropriation rules established by claim clubs were perfect. As Anderson and Hill note: “As long as those bargaining for property rights are free to choose their own definition process, there is an incentive to reduce definition costs since they are residual claimants. This is not to say that they will always resolve the issue and define property rights at the lowest cost” (Anderson and Hill 1983: 441). Claim clubs might establish property rules that are insensitive to distributional concerns (since claim clubs only contained a subset of the relevant population), and they might develop rules that impose externalities on persons outside the club.<sup>14</sup> I do not deny these issues. The claim I am making is a comparative one. Local

---

<sup>13</sup> See also Anderson and Hill (1983).

<sup>14</sup> Of course, the labor mixing system of first appropriation is also subject to the problem of externalities. In fact, there is compelling evidence that the homesteading system (which, I argued, strongly resembles the labor mixing system) was a key cause of the Dust Bowl (e.g., Zeynep and Libecap 2004). There are two important points to note here.

appropriation rules developed by residual claimants will result in less wasted resources when compared to appropriation rules developed by those who lack skin in the game. If the goal is to encourage the productive use of resources, this is a good thing.

Here, it might be thought that persons in a labor mixing system of first appropriation *do* have skin in the game, because any waste of resources will be a waste of their resources. There is a sense in which this is true, but also a sense in which this objection misses the broader point. If one is forced to mix one's labor with resource  $x$  in order to gain a property right, then one will mix one's labor in the most productive manner possible. Yet, if labor mixing *itself* is inefficient, then even the most efficient mixing of labor will be inefficient when compared to alternative systems of first appropriation. The key is not only to have residual claimants decide on how to use their resources within a fixed set of appropriation rules, but to also have residual claimants *decide on the appropriation rules themselves*. The Lockean labor mixing system allows the former, but not the latter. Requiring labor mixing to gain property allows persons to mix their labor in the most productive manner they know how, but it does not allow them to choose different appropriation rules when labor mixing itself is unproductive.

---

First, claim clubs probably did a better (but still imperfect) job at limiting externalities when compared to the labor mixing system. This is because claim clubs formulated appropriation rules on a communal basis. Members of the community would likely not form rules that allowed appropriators to impose externalities on other members *within* the community, but they likely would not care about forming rules that allowed appropriators to impose externalities on members *outside* the community. Since the labor mixing system did not require communal input, it was not sensitive to the problem of imposing externalities on persons both *within* and *outside* communities. So, local appropriation rules outperform labor mixing in terms of limiting *some* externalities.

Still, local appropriation rules do allow for significant externalities. Given the global nature of some externalities (such as climate change), it is unclear there exists an appropriation rule able to deal with this. One could try to expand the scope of the community to account for global externalities, but at some point the transaction costs associated with forming rules would become so great so as to disallow any rules from being formed at all. In all likelihood, externalities on a global scale require some kind of centralized government regulation. It is important to note, though, that this applies to both appropriation rules established by local communities, as well as the Lockean labor mixing system.

So, how did claim clubs handle the first appropriation of natural resources? Here we find an incredible diversity of different standards. Consider first variance in permitted claim size. In Dane County, Wisconsin, members could claim up to 160 acres of farmland along with 40 acres of timberland. But in Canon City, Colorado, members were permitted to claim 640 acres of timberland. As a general rule, claim clubs tended to allow persons to claim plot sizes ranging between 160 and 480 acres, though there were exceptions (as in the case of Canon City, for instance) (Murtazashvili 2013: 73). There was also diversity in terms of occupancy requirements. Focusing strictly on claim clubs in Iowa, three clubs – Poweshiek, Johnson, and Webster – required persons to perform labor in order to gain a property right; the rest did not require labor mixing (Anderson and Hill 1983: 444-445). Among those clubs that did require labor mixing, there is still more diversity. In Webster County, claimants had to expend \$10 worth of labor every month after the initial month, while in Poweshiek county claimants had to perform \$30 worth of labor every six months (Anderson and Hill 1983: 445). In Cherry Creek Valley, Colorado, claimants had to perform \$50 worth of improvements within the first 50 days, and another \$25 worth of improvements during each successive quarter (Murtazashvili 2013: 74).

Why so much diversity in terms of appropriation rules among claim clubs? The answer is that “clubs adapted regulations to local conditions” (Murtazashvili 2013: 73). There is no general answer to the questions: what is the optimal size of a plot of land? What is the optimal amount of labor to perform on it? Answers to these questions are highly dependent on time and place. Profitable ranching might require more land than profitable timber harvesting, which might require more land than profitable corn farming. Moreover, in some areas, the value that can be extracted from the land is net positive. In these cases, it makes sense to require persons to perform labor on the land in order to gain a property right. Labor mixing, in such cases, does not

destroy wealth. In other cases, the value that can be extracted from the land is currently net negative. Here, it does not make sense to require modifications to the land in order to gain a property right. Such a requirement would dissipate future value that could be extracted from the land later on.

The fundamental lesson we learn from claim clubs is that there is no single appropriation rule that best encourages the production of wealth. Which appropriation rule does this will always depend on local conditions. *This* is the central problem with the Lockean labor mixing theory. Sometimes (perhaps in Britain at the time of Locke's writing) encouraging persons to plow fields and dig irrigation ditches *is* what best encourages productivity. But in other times and places (for instance, in much of the American West where populations were sparse and transportation costs high) encouraging persons to mix their labor with the land destroys wealth. Local conditions matter, and general appropriation rules that apply universally (like the labor mixing system) miss this crucial fact. This was the big problem with the Homestead Act of 1862 which, I argued above, offered a rough approximation of Locke's labor mixing theory of first appropriation. As land historian Benjamin Hibbard notes: "The great weakness of the Homestead Act was, and is, its utter inadaptability to the parts of the country for which it was not designed" (Hibbard 1924: 409). The same applies to Locke's theory of labor mixing.

What does this all mean for how we should flesh out the individuation element of the Lockean theory of property? The main lesson is that if the justification element of the Lockean theory of property is that property encourages the production of wealth, then there should be no single appropriation rule that applies in all cases. The appropriation rule that encourages productivity in Britain will be different from the one which encourages productivity in Montana, which will be different from the one that encourages productivity in Uganda. So, the

individuation element of the Lockean theory of property must be determined on a case-by-case basis, always adapting to local conditions.

There are many ways appropriation rules adapted to local conditions might develop. Claim clubs were literal social contracts. Communities got together and decided on appropriation rules that allowed them to use resources productively. This worked out well, because any waste of resources would be a waste of *their* resources, so the result was relatively efficient appropriation rules. One might think that Locke would have a problem with this, as he seems to reject consent theories of appropriation. However, he rejects consent theories of appropriation because if the consent of “all mankind” was “necessary” then persons would have “starved, notwithstanding the plenty God had given him” (Locke 1980: 19). Claim clubs, though, did not involve all mankind, only those who were a part of the local community. In general, the costs associated with reaching agreements shrink as the size of the group decreases (Buchanan and Tullock 1999: 68-70). Though claim clubs governed appropriation by consent, the consent was among a relatively small group. As a result, claim clubs were able to form good appropriation rules, and the members of claim clubs did not starve.

Appropriation rules adapted to local conditions need not arise through social contracts, however. Property rules can arise spontaneously, through iterated interactions between persons (e.g., Demsetz 1967; Alchian and Demsetz 1973; Anderson and Hill 1975; Ellickson 1994; Gintis 2007). In fact, some argue that, when certain conditions hold (for example, if a group is sufficiently close-knit), property rules will spontaneously evolve “whose content serves to maximize the aggregate welfare that members obtain in their workday affairs with one another” (Ellickson 1994: 167). The point here is that there are many ways appropriation rules adapted to local conditions might develop. They can arise through social contracts, or they can evolve



spontaneously. I do not want to claim that one method is better than the other. My central thesis is that Lockeans, to live up to their justification element, must adopt appropriation rules adapted to local conditions. There are many ways such rules can arise, and I do not take a stand on whether one method for arriving at these rules is superior to another.

Here, then, is a summary of the proposal. The justification element of the Lockean system of property says that the institution of property is justified because property creates wealth by encouraging persons to use resources productively. No general appropriation rule can achieve this end. To achieve this end, appropriation rules must be tailored to local conditions. This can be accomplished by allowing persons in local communities to form their own appropriation rules by social contract. These persons have an incentive to form good rules, as any unproductive use of resources will be an unproductive use of *their* resources. Or, it can be accomplished by allowing property rules to slowly evolve in a manner that is sensitive to local conditions. The main point is that Lockeans, in order to live up to their justification for the institution of property, should embrace a diversity of appropriation rules that are always tailored to local conditions, rather than the universal labor mixing standard.

Acknowledgements: The author would like to thank Andrew Williams of *Politics, Philosophy & Economics* as well as two anonymous reviewers for their tremendous feedback. The paper was greatly improved as a result. The author would also like to thank Bryan Leonard for helpful discussion of the economics surrounding the Homestead Act.

Biography: Brian Kogelmann is an Assistant Professor of Philosophy at the University of Maryland, College Park. He works at the intersection of philosophy, political science, and economics.

#### Works Cited

- Acemoglu, Daron and Simon Johnson. 2005. "Unbundling Institutions." *Journal of Political Economy* 113: 949-995.
- Acemoglu, Daron, Simon Johnson, and James Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91: 1369-1401.
- Acemoglu, Daron and James Robinson. 2012. *Why Nations Fail*. New York: Crown Publishing.
- Alchian, Armen A. and Harold Demsetz. 1973. "The Property Right Paradigm." *Journal of Economic History* 33: 16-27.
- Allen, Douglas W. 1991. "Homesteading and Property Rights; Or, 'How the West Was Really Won.'" *Journal of Law & Economics* 34: 1-23.
- Allen, Douglass W. and Bryan Leonard. 2020. "Property Right Acquisition and Path Dependence: Nineteenth Century Land Policy and Modern Economic Outcomes." Working paper, available at: <https://drive.google.com/file/d/1hpZz6hPES6F0RmkQ3Q5KNYZvLnZvqYGc/view>.
- Anderson, Terry L. and Peter J. Hill. 1975. "The Evolution of Property Rights: A Study of the American West." *Journal of Law & Economics* 18: 163-179.
- Anderson, Terry L. and Peter J. Hill. 1983. "Privatizing the Commons: An Improvement?" *Southern Economic Journal* 50: 438-450.
- Anderson, Terry L. and Peter J. Hill. 1990. "The Race for Property Rights." *Journal of Law & Economics* 33: 177-197.
- Anderson, Terry L. and Peter J. Hill. 2004. *The Not So Wild, Wild West*. Palo Alto: Stanford University Press.
- Barrett, Jacob. 2020. "Punishment and Disagreement in the State of Nature." *Economics and Philosophy* 36: 334-354.
- Bohanon, Cecil E. and Philip R.P. Coelho. 1998. "The Costs of Free Land: The Oklahoma Land Rushes." *Journal of Real Estate Finance and Economics* 16: 205-221.
- Bruner, Justin. 2020. "Locke, Nozick, and the State of Nature." *Philosophical Studies* 177: 705-726.
- Buchanan, James M. and Gordon Tullock. 1999. *The Calculus of Consent*. Indianapolis: Liberty Fund.

- Chung, Hun. 2020. "Locke's State of Nature and its Epistemic Deficit: A Game-Theoretic Analysis." Available at: [https://drive.google.com/file/d/1BX1RV\\_rjMgWzOz0EwsRWR8JscRTvgD6m/view](https://drive.google.com/file/d/1BX1RV_rjMgWzOz0EwsRWR8JscRTvgD6m/view).
- Demsetz, Harold. 1967. "Toward a Theory of Property Rights." *American Economic Review* 57: 347-359.
- Dennen, R. Taylor. 1977. "Some Efficiency Effects of Nineteenth-Century Federal Land Policy: A Dynamic Analysis." *Agricultural History* 51: 718-736.
- Department of the Interior. 1926. "Suggestions to Homesteaders and Persons Desiring to Make Homestead Entries." Digitized by HathiTrust Digital Library. Available at: <https://babel.hathitrust.org/cgi/pt?id=mdp.39015036692385&view=1up&seq=1>.
- Ellickson, Robert C. 1994. *Order without Law*. Cambridge: Harvard University Press.
- Epstein, Richard A. 1994. "On the Optimal Mix of Private and Common Property." *Social Philosophy & Policy* 11: 17-41.
- Epstein, Richard A. 2015. "From Natural Law to Social Welfare: Theoretical Principles and Practical Applications." *Iowa Law Review* 100: 1743-1772.
- Gates, Paul W. 1976. "An Overview of American Land Policy." *Agricultural History* 50: 213-229.
- Gintis, Herbert. 2007. "The Evolution of Private Property." *Journal of Economic Behavior & Organization* 64: 1-16.
- Haddock, David D. 1986. "First Possession Versus Optimal Timing: Limiting the Dissipation of Economic Value." *Washington University Law Review* 64: 775-792.
- Hibbard, Benjamin. 1924. *A History of the Public Land Policies*. New York: Macmillan.
- Kirzner, Israel. 2016. *Discovery, Capitalism, and Distributive Justice*. Indianapolis: Liberty Fund.
- Koglemann, Brian and Benjamin Ogden. 2018. "Enough and as Good: A Formal Model of Lockean First Appropriation." *American Journal of Political Science* 62: 682-694.
- Libecap, Gary D. 2007. "The Assignment of Property Rights on the Western Frontier: Lessons for Contemporary Environmental and Resource Policy." *Journal of Economic History* 67: 257-291.
- Locke, John. 1980. *Second Treatise of Government*. Indianapolis: Hackett Publishing.
- Lomasky, Loren E. 1987. *Persons, Rights, and the Moral Community*. Oxford: Oxford University Press.
- Mattheis, Ross and Itzchak Tzachi Raz. 2019. "There's No Such Thing As Free Land: The Homestead Act and Economic Development." Working paper, available at: [https://scholar.harvard.edu/files/iraz/files/Raz\\_JMP\\_2019.pdf](https://scholar.harvard.edu/files/iraz/files/Raz_JMP_2019.pdf).
- Moller, Dan. 2019. "Redistribution and Self-Ownership." *Social Philosophy & Policy* 36: 196-211.

- Murtazashvili, Iia. 2013. *The Political Economy of the American Frontier*. Cambridge: Cambridge University Press.
- Nozick, Robert. 1974. *Anarchy, State, and Utopia*. New York: Basic Books.
- Rose, Carol. 1985. "Possession as the Origin of Property." *University of Chicago Law Review* 52: 73-88.
- Schmidtz, David. 1990. "When is Original Appropriation Required?" *The Monist* 73: 504-518.
- Schmidtz, David. 2008. *Person, Polis, Planet*. Oxford: Oxford University Press.
- Simmons, A. John. 1992. *The Lockean Theory of Rights*. Princeton: Princeton University Press.
- Steiner, Hillel. 1994. *An Essay on Rights*. Oxford: Blackwell.
- Tomasi, John. 2012. *Free Market Fairness*. Princeton: Princeton University Press.
- Van der Vossen, Bas. 2009. "What Counts as Original Appropriation?" *Politics, Philosophy & Economics* 8: 355-373.
- Van der Vossen, Bas. Forthcoming. "Property, the Environment, and the Lockean Proviso." In *Economics & Philosophy*.
- Zeynep, Hansen K. and Gary D. Libecap. 2004. "Small Farms, Externalities, and the Dust Bowl of the 1930s." *Journal of Political Economy* 112: 665-694.