
The Creation of Knowledge in Society

Waste Defined by Property and Exchange

ART CARDEN AND ROSOLINO A. CANDELA

The right to private property is capitalism’s institutional cornerstone. Anonymous, impersonal exchange—which generates the market prices that guide people’s choices—is easier and more extensive when private property rights are secure. Prices also guide entrepreneurial discovery and make it possible to calculate the profits and losses that tell people when they have corrected (or exacerbated) errors in the structure of production. Private property rights form the institutional context in which people *learn*, via the resulting market prices, profits, and losses, when resources have been allocated efficiently or wastefully (Kirzner 1973). The ultimate judges of whether an allocation is “efficient” or “wasteful” are the sovereign consumers, who express their beliefs and values through their decisions to buy or abstain (Hutt 1936 [1990], 257–72). Private property rights serve an important allocative function, and they also generate the knowledge we would need to know whether goods have been “wasted” or “spoiled.”

Art Carden is Margaret Gage Bush Distinguished Professor of Business, Samford University, senior fellow with the American Institute for Economic Research, and research fellow with the Independent Institute. **Rosolino A. Candela** is senior fellow of the F. A. Hayek Program for Advanced Study in Philosophy, Politics, and Economics, program director of Academic and Student Programs, Mercatus Center, George Mason University, and a research fellow with the Independent Institute. This is a revised version of Independent Institute Working Page 82.

The Independent Review, v. 27, n. 4, Spring 2023, ISSN 1086–1653, Copyright © 2023, pp. 553–568.

In his *Second Treatise of Government* ([1690] 1980), John Locke provided one of the most important and well-known justifications for the original acquisition of private property. According to the “Lockean Proviso,” two conditions justify the original acquisition of a previously unowned resource. First, there is the “enough, and as good” condition. As Locke writes:

Whatsoever then he removes out of the state that nature hath provided, and left it in, he hath mixed his *labour* with, and joined to it something that is his own, and thereby makes it his *property*. It being by him removed from the common state nature hath placed it in, it hath by this *labour* something annexed to it, that excludes the common right of other men: for this *labour* being the unquestionable property of the laborer, no man but he can have a right to what that is once joined to, at least where there is enough, and as good, left in common for others. (19; emphasis original)

The second condition, which Thomas Mautner refers to as the “non-spoilage condition” (1982, 260), is regarded as “less significant” (Mack 2009, 61) of the two and is satisfied if the originally acquired resource is not wasted or left to spoil. Locke explains:

It will perhaps be objected to this, that if gathering the acorns, or other fruits of the earth, makes a right to them, then any one may *ingross* as much as he will. To which I answer, Not so. The same law of nature, that does by this means give us property, does also *bound* that *property* too...As much as anyone can make use of to any advantage of life before it spoils, so much he may by his labour fix a property in: whatever is beyond this, is more than his share, and belongs to others. Nothing was made by God for man to spoil or destroy. ([1690] 1980, 20–21; emphasis original)

Robert Nozick’s *Anarchy, State, and Utopia* (1974) inspired a large and growing body of research by economists, philosophers, and political scientists defending the Lockean Proviso and using economists’ tools to identify when it holds (Vaughn 1980; Schmidtz 1990; 1994; Rasmussen and Den Uyl 1991; 2005; Ekman 2017; Carden 2018; Kogelmann and Ogden 2018).

Given the importance of this Proviso to private property’s defenders and its implications for social order, what is the relationship between private property and the Lockean Proviso? We pay particular attention to the “non-spoilage” requirement.¹ We argue that, if the Lockean Proviso is a normative condition of private property, then this can be *realized* only in a context of private property itself. Therefore, the knowledge required for the Lockean Proviso’s satisfaction emerges as a *by-product* of private property because private property establishes the institutional

1. See Carden 2018 for a discussion of the “enough and as good” condition.

precondition for exchange, which creates meaningful market prices. Market prices, in turn, encourage people to economize on resources, and therefore generate the context-specific knowledge that makes it much easier to detect waste and “spoilage.” This is especially important when exchange is anonymous and when no one person knows precisely why, say, the marginal tree is more valuable as furniture than paper. “The most significant fact about this system,” Hayek writes, “is the economy of knowledge with which it operates, or how little the individual participants need to know in order to be able to take the right action” (1945, 526–27). Moreover, just as profits and losses are not independent aspects of market pricing in a capitalist, private-property economy, the Lockean Proviso’s conditions are also not independent of one another. Whether there is “enough, and as good” of a resource cannot be understood independently of whether a resource is left to spoil or be wasted. Therefore, identifying “spoilage” or “enough, and as good” requires context-specific knowledge. Private property and voluntary exchange generate market prices that communicate context-specific knowledge, particularly when exchange extends beyond repeated face-to-face interaction. Furthermore, an object’s “value” is contingent upon the bundle of rights attached to it (Pejovich 2012, 11). There is no “value” independent of the bundle of rights. Changing the bundle changes the value.

Our argument builds on literature integrating Austrian and transaction-cost economics (Williamson 1979; 1991; Langlois 1992; Klein 1999; Pejovich 2003; Anderson and Hill 2004; Candela and Geloso 2019; Burns and Fuller 2020; Piano and Rouanet 2020; Candela, Boettke, and Jacobsen 2023). From the standpoint of these two traditions, the question is not whether waste and spoilage can be understood, detected, or identified. Transaction costs are ubiquitous, and so are waste and spoilage. We ask how people can evaluate waste and spoilage in a complex economy with an extensive division of labor and anonymous exchange.

An Austrian approach emphasizes how market pricing provides “a system of telecommunications which enables producers” (Hayek 1945, 527) to value resources’ alternative uses, particularly when exchange is anonymous. A transaction-cost approach explains how private property emerges because it reduces measurement and information costs (Barzel 1982; North 1990; Munger 2018). Ronald Coase explains how Austrian economics and transaction-cost economics complement one another: “a large part of what we think of as economic activity is designed to accomplish what high transaction costs would otherwise prevent *or to reduce transaction costs so that individuals can freely negotiate and we can take advantage of that diffused knowledge of which Hayek has told us*” (1992, 716; emphasis added).

By interpreting the Lockean Proviso in light of Austrian and transaction-cost economics, we highlight private property’s *epistemic* importance (see Boettke 2018). Specifically, private property guides people toward resource distributions, satisfying the Lockean Proviso with reference to market prices. Economic analyses of the Lockean Proviso have emphasized the “enough, and as good” condition. Even if a resource was acquired justly, whether the “enough and as good” condition has been

satisfied requires market prices to communicate the opportunity costs of this acquisition, which makes it possible to determine whether or not the acquisition satisfies the “non-spoilage” condition. Market prices provide the context-specific knowledge necessary to determine whether the conditions of the Lockean Proviso are satisfied, particularly when we are coordinating millions of people’s diverse, and often conflicting, wants. With anonymous exchange and an extensive division of labor, the normative satisfaction of the “non-spoilage” and “enough, and as good” conditions are opposite sides of the same *economic* problem.

The next section examines the positive rather than normative attributes of the Lockean Proviso. Then we explore entrepreneurial discovery and the market process (Kirzner 1973; [1989] 2016). Entrepreneurial discovery is not only compatible with Locke’s labor-mixing theory of private property. The Lockean Proviso’s satisfaction depends on it. People must discover and learn if a resource has been wasted to learn if “enough, and as good” has been left for others. The final section concludes with implications for future research.

Resources and Waste Defined in the Process of Their Emergence

“Arguably the most controversial component in the Lockean tradition of liberalism,” according to Douglas Rasmussen and Douglas Den Uyl, “is the natural right to private property” (2005, 97). For Locke, the “great and *chief end*, therefore, of men’s uniting into common-wealths, and putting themselves under government, *is the preservation of their property*” ([1690] 1980, 66; emphasis original). This helps us understand how the Lockean Proviso’s normative implications flow from a positive understanding of property rights.

According to Eirik Furubotn and Svetozar Pejovich, property rights refer “*to the sanctioned behavioral relations among men that arise from the existence of things and pertain to their use*” (1972, 1139; emphasis original). They define people’s ability to exercise choice over a resource, and therefore they define the rights to an action rather than an object per se. Excluding others from a resource is one choice, and property rights create residual claimancy that concentrates the benefits and costs of choice on the owner. Property rights also confer the ability to use a resource for present consumption, future consumption (i.e., savings), or indirect consumption via specialization and exchange. The ability to exchange distinguishes *private* property from other forms of property (Mises [1920] 1975; Alchian 1965, 822; see also Ostrom 2010) because it establishes the institutional preconditions for the emergence of exchange ratios, or market prices.

Three positive implications follow from Furubotn and Pejovich’s definition. First, ubiquitous scarcity, not property rights, implies disagreement. Private property resolves it: it gives people incentives to conserve and produce, and exchange

generates the knowledge embodied in market prices necessary for peaceful and productive conciliation. Second, private property rights are indispensable because prices, profits, and losses help people update their imperfect knowledge about resources' best uses. Third, private property rights are a social liability insofar as they also embody an owner's responsibility for the consequences of using a resource (Mises [1949] 2007, 311).

Where there is private property, the Lockean Proviso is satisfied as a by-product of *entrepreneurial discovery*. With anonymous exchange and an extensive division of labor, neither transformation of a physical object into a "resource" or a "good" nor detection of "spoilage" or "waste" through entrepreneurial discovery has any relevant *economic* meaning independent of private property itself.² This is because without private property, market prices cannot communicate resource values and, therefore, do not direct resources toward their most efficient uses. For example, suppose that an entrepreneur discovers a plot of land suitable for raising cattle. Cattle can produce milk, which can be used to produce yogurt.³ Cattle can also be slaughtered for leather that can be used to produce baseball gloves. Producing yogurt means forsaking baseball gloves. If market prices are not available to communicate when the price of baseball gloves has increased relative to yogurt, then entrepreneurs will continue to produce the same amount of milk as before and waste resources because they will not get the message that they are making a mistake, or they will bear the consequences (losses). Such a situation violates the "enough, and as good" condition, because the land used to raise cattle that would have been slaughtered for leather is misallocated. In turn, the "non-spoilage" condition is also violated because milk and yogurt are overproduced, which wastes resources.

Transaction costs reveal how the relevant knowledge embodied in market prices is context specific. Israel Kirzner defines transaction costs as the costs "of obtaining the information necessary to enter into and complete bargaining negotiations" (Kirzner 1973, 227).⁴ Michael Munger best summarizes three distinct aspects of transaction costs as "triangulation, transfer, and trust" (2018, 79). Using Uber as an example, Munger explains how Uber's software reduces the transaction costs of (1) drivers and passengers finding each other (triangulation); (2) communicating what are the attributes to exchange, including the type of automobiles available for demand, location of departure and arrival, and form of payment (transfer); and (3) sharing information about prospective drivers and passengers through a rating system (trust). Reducing transaction costs makes anonymous exchange easier and releases resources otherwise tied up in triangulation, transfer, and trust. Fundamentally, then, transaction costs reflect the cost of obtaining the information necessary

2. We use the terms interchangeably here, but later we discuss the distinction between *spoilage* and *waste* in Locke's *Second Treatise of Government*.

3. This example is adapted from Sowell 1980, 51.

4. See also Dalhman 1979, 148.

to define and exchange property rights (see Alchian and Allen 1972, 240; Wallis and North 1986, 102; Allen 1991).

From a static standpoint, transaction costs would seem to obstruct assignments of rights that leave “enough, and as good” and minimize spoilage. From a dynamic standpoint, private property rights, exchange, and entrepreneurial losses make it easier to identify waste and spoilage. This is because, as Ronald Coase argues, transaction costs are fundamentally the cost of “*discovering what the relevant prices are*” (1937, 390; emphasis added). To the extent that scholars have emphasized “enough, and as good” more than “non-spoilage,” they have neglected not only how private property emerges to reduce the transaction costs of market pricing, but also that market pricing implies that satisfying the “enough, and as good” condition and the “non-spoilage” condition are opposite sides of the same *economic* problem (Carden 2018).

Scholars have focused on the “enough, and as good” condition for two reasons. First, goods differ in their physical attributes as treated under each condition (Kogelmann and Ogden 2018). This dichotomy is unnecessary. Concerning “enough, and as good,” Locke seemed to have in mind a non-perishable resource like land. For “non-spoilage,” Locke referred to perishable items, like apples.

Second, waste seems unimportant to the argument for first-user appropriation if the physical characteristics determine how goods are categorized. As Ekman argues, “the problem of initial acquisition in moral philosophy is essentially limited to things that are not created, or at least not created in significant part,” like land (2017, 52). Spoilage seems less important because “unappropriated non-durables will soon perish, which ensures that acquisitions do not deprive non-acquirers” (52). Even if someone appropriates more apples than he can consume, to borrow an example from Locke ([1690] 1980, 19, 28), this does not necessarily imply spoilage. First, there is an insurance motive for appropriating “too many” apples. Second, apples can be exchanged, for example, and Locke argues that “thus *came in the use of money*, some lasting thing that men might keep without spoiling, and that by mutual consent men would take in exchange for the truly useful, but perishable supports of life” (28; emphasis original). Hence there is also a speculative motive. Private property rights encourage conservation because “surplus” apples can be exchanged for other goods before they spoil.⁵

For apparently fixed and permanent resources like land, it would seem like the costs of spoilage do not constrain an appropriator. Even then, there are several reasons why appropriation satisfies the “enough, and as good” criterion. First, according to Ekman (2017), the “enough, and as good” condition is satisfied when the conditions of the Coase Conjecture (1972) hold. Coase conjectures that “the price becomes independent of the number of suppliers and is thus always equal to the

5. On this point, see also Waldron 1979, 322.

competitive price” when a good has “complete durability” (144). This is presumably true about land. A price-making monopoly appropriator of land, for example, will compete against her future self and, therefore, drive down the price as she sells more plots. In anticipation of the lower prices, consumers will withhold their purchases until the price of land is driven down to its opportunity cost, thereby leaving “enough, and as good” for everyone else.⁶

The Coase Conjecture outcome satisfies the Lockean Proviso’s “enough, and as good” condition, but Ekman is silent on how people discover it. The “spoilage condition” is irrelevant, because the Coase Conjecture automatically satisfies the Lockean Proviso (Ekman 2017, 45). But as we discuss in greater detail in the next section, a just distribution of private property satisfying both conditions of the Lockean Proviso requires market pricing.

If theories of original appropriation have “minor importance within modern societies” (Mautner 1982, 267), and if the “original situation is not fair, and appropriating land does not thereby make it fair” (Schmidtz 1990, 511), then we should explore the conditions satisfying the Lockean Proviso incompletely. That is, rather than regarding the distribution of private property as “imperfect” in the sense of being “flawed” or “sub-optimal” compared to an ideal that satisfies the Lockean Proviso, distributive justice should be judged in terms of being “imperfect” in the sense of activity that is “incomplete” or “not thoroughly done” and therefore *in a continuing state of completion* (Candela 2020; Boettke and Candela 2021).

Building on this point, our argument overlaps with that of David Schmidtz (1990), who argues that satisfying the “enough, and as good” condition is a by-product of original appropriation, not a precondition to it. “To satisfy the Proviso with respect to apples,” Schmidtz argues, “one must appropriate land rather than apples. Hence, land appropriation is not a violation of the Proviso (given that the Proviso applies first and foremost to food) under those circumstances, but *must instead be required by it*” (509; emphasis added). Appropriation satisfies the “enough, and as good” condition because it allows later generations to live richer, fuller lives. Schmidtz points out how the objection that the first appropriators are the “lucky ones” fails: it is the latecomers, not the first users, who are lucky, because they start out endowed with a much greater stock of resources and wealth. He argues specifically that ignoring the Proviso and simply refusing to restrict ownership is a sure-fire way to ensure that there is most definitely *not* “enough, and as good” left for others as the well-known tragedy of the commons emerges (Hardin 1968). The problem facing later generations is not that they need resources to *appropriate*; instead, they need resources to *use*.

6. Whereas Coase (1972) argues that the price of a completely durable good will be driven down to a perfectly competitive price, which may be positive, Ekman (2017) makes the stronger claim that the case of land will result in a zero money price.

Schmidtz alludes to the issue we address, specifically that the “enough, and as good” and “non-spoilage” conditions are linked when, as a result of private property rights, the extent of market exchange broadens across millions of individuals participating in anonymous exchanges with each other, requiring market pricing to communicate knowledge about scarcity. Although Schmidtz focuses primarily on the role property rights play in creating incentives, he alludes to the epistemic importance of the “non-spoilage” condition. As Schmidtz states, “Locke is also basically on target in specifying the nature of the required justification; that is, one should not appropriate goods from the commons *without stopping to consider what one is leaving for others*” (Schmidtz 1990, 508; emphasis added). Whereas Schmidtz argues “only that the establishment of exclusive control ... can be justified,” we extend this point one step further, arguing that exclusivity of property is a necessary, though not a sufficient, condition for satisfying the Lockean Proviso. To the extent that the Lockean Proviso is realized, it is because *private* property entails the ability to exchange, without which market pricing would not exist. This implies that *private property* is required before objects can be defined in terms of their value as *resources* and *goods*. We know what “enough, and as good” means only because market prices communicate the profitability or unprofitability of entrepreneurial decisions.

Still, there is more to the relationship between appropriation, exchange, and the definition of goods. Locke’s “no spoilage” condition seems to be another limit to private property. *Waste*, however, presupposes standards by which we can compare uses to the best alternatives. However, private property rights emerge to reduce transaction costs and, therefore, generate market prices that communicate what can be regarded as “goods” and “waste” in the first place. Just as property and exchange determine what is and what is not a *resource*, they also frame the social learning process that tells us whether something has been “wasted” or not.

The Lockean Proviso, Distributive Justice, and Entrepreneurial Discovery

According to Israel Kirzner (1988), the argument against the possibility of economic calculation under socialism by Ludwig von Mises ([1920] 1975; [1922] 1951) and F. A. Hayek (1948) has a fundamental implication for distributive justice and the market process, particularly as it pertains to the *entrepreneurial discovery* of private property rights. This normative implication bears on the extent to which the “enough, and as good” condition has been emphasized relative to the “non-spoilage” condition for several reasons. First, from a market process perspective, the labor-mixing criterion may be a necessary condition for the justifiable appropriation of private property, but contrary to Mautner (1982, 260), it is not sufficient. For land to meet the “enough, and as good” condition, people must also discover whether or not the use of the land does not violate the “non-spoilage” condition. Second, building on Kirzner, filtering the Lockean Proviso through an Austrian discovery paradigm reveals a

false dichotomy between the “enough, and as good” condition and “non-spoilage” condition based on goods’ physical attributes. Therefore, the two conditions of the Lockean Proviso are inherently intertwined and must be discovered through *creating* resources, detecting errors (i.e., waste), and correcting these errors via market prices that guide resources into progressively higher-valued consumer uses. We will elaborate on each of these points in the subsections below.

Is the “Enough, and As Good” Condition Good Enough? A Market-Process Perspective

Private property rights in the means of production are necessary because they allow entrepreneurs to appraise factors of production and guide them toward their highest-valued uses as derived from consumer demands. Appropriation is one way to establish these rights, and it lets us define goods with reference to the wants they can satisfy. Market prices, profits, and losses are necessary to determine whether something has been “wasted” or not.

Kirzner explains that entrepreneurial discovery in markets entails entrepreneurial discovery of resources that are created *ex nihilo* (1988, 181; [1989] 2016, 43). Land and other resources existed *physically* before their discovery, but they did not exist *economically* and were irrelevant until people discovered, first, that they were there and, second, how they could be used to satisfy wants (Kirzner [1989] 2016, 20).⁷ Therefore, property rights are meaningless without choice, alertness, and discovery. Particularly in the case of land, this implies that the problem of leaving “enough, and as good” is not an allocation problem of sharing a preexisting resource endowment. Schmidtz is right that appropriation from the commons based on Locke’s labor-mixing criterion is necessary to leave “enough, and as good” for future generations. From the standpoint of entrepreneurial discovery, there is not even a “commons” to speak of before people know it is there physically. Thus, as Kirzner states, “[I]f your acquisitive act consists in originating something that had not been in prior existence—and the specific possibility of which had not been anticipated—it is hard to see how your act can be described as being harmful to everyone else” ([1989] 2016, 151; emphasis original). Rasmussen and Den Uyl highlight this Kirznerian point: “since property is created or produced through an act of transformation, the Lockean proviso that there must be ‘enough and as good’ left for others in cases of original acquisition is moot. For there can never be ‘enough and as good’ left for others if every action issues in a unique transformation” (2005, 101).⁸

7. Building on this point, it is for this reason that Julian Simon (1981) regards the ultimate resource to be the human mind, which is unbound in its ability to discover indefinite amounts of resources, including land after it has become scarce, implying that even the quantity of land is not fixed. The opportunity to create new land, for example, has been discovered either by draining swamps or raising dykes (see Candela and Geloso 2021).

8. Related to this point, see also Mack 1995.

None of this is meant to suggest that Locke’s labor-mixing criterion, upon which original appropriation is based, is inconsistent with an entrepreneurial discovery approach. Indeed, the two approaches complement each other. Although mixing one’s labor may be necessary to confer physical assignment to a resource, it does not automatically grant a private property right, because this must also entail *the assignment of consequences of one’s choices exercised over that good* (Candela 2021).

Delineated property rights make it easier to define and assess scarcity. Abstract objects come to be defined by their valuable uses (Menger [1871] 1981, 74–76; Carden 2018). The labor-mixing act alone will not be sufficient to tell someone whether an object is an economic good, let alone its economic value. He must discover how it can be used to satisfy his wants, and this discovery process must be guided by market pricing. That knowledge develops as he experiments, and the object comes to be infused with the first user’s knowledge and experience. It comes to be defined as a good (or bad) depending on whether it satisfies consumer wants or not. To adapt the title of Buchanan ([1982] 1999), resources and waste are defined in the process of their emergence.

Though *individuals* discover entrepreneurially, the fact that we are members of *societies* gives us the wherewithal to satisfy extended wants (Hume [1739] 1896). We can divide labor and thereby raise our productivity. Importantly, we also divide knowledge, and therefore “there is here a problem of the *Division of Knowledge* which is quite analogous to, and at least as important as, the problem of the division of labour” (Hayek 1937, 49; emphasis original).⁹ In the social division of knowledge, we can harness and deploy others’ knowledge for our purposes—purposes others needn’t know, understand, or sanction. Market prices increase the range of potential experiments by allowing individuals to economize on the information necessary to know when “enough, and as good” of a resource exists, as well as minimizing waste. The greater the extent of anonymous exchange, the more important market prices become as measures of opportunity cost and transmitters of information. All of this implies that satisfaction of both conditions of the Lockean Proviso cannot be framed in terms of a state of affairs, but as a by-product of entrepreneurial discovery guided by market pricing.

Discovery, Spoilage, and Waste

We have argued that the dichotomy between the “enough, and as good” condition and the “non-spoilage” condition based on the physical attributes of resources is misleading given that property rights emerge from their creation *ex nihilo* by an act

9. Related to our point here, Tebble (2020) argues that what is left out of the traditional Humean account of the circumstances of justice is that in addition to scarcity and limited benevolence, there is also uncertainty, which need rules of justice (property), primarily for the purpose of generating knowledge to overcome uncertainty.

of discovery. However, there is another basis from which we can reframe the relationship between the two conditions of the Lockean Proviso: the distinction between “waste” and “spoilage” in Locke’s account. With reference to land, there seem to be two ways Locke defines the term “waste.” The first refers to uncultivated land, and the second seems to refer to the failure to realize another readily available opportunity. As Locke explains:

[W]hatsoever he tilled and reaped, laid up and made use of, before it spoiled, that was his peculiar right; whatsoever he enclosed, and could feed, and make use of, the cattle and product was also his. But if either the grass of his inclosure rotted on the ground, or the fruit of his planting perished without gathering, and laying up, this part of the earth, notwithstanding his inclosure, was still to be looked on as waste, and might be the possession of any other. ([1690] 1980, 24)

The distinction between spoilage and waste in this passage is blurred compared to saying waste happens simply because land is left uncultivated. The only way uncultivated land can be regarded as “wasted” is if someone, before taking possession of it, is already aware of its existence and fails to realize its most valued consumer use, implying that market prices are already available to communicate the opportunity cost of land according to its alternative consumer uses.

Returning to our earlier example, the entrepreneur who originally acquires a piece of land by discovering that it is productive, and taking possession of it for raising cattle, could have produced leather or milk. The farmer’s economically relevant choice will depend on knowledge about the demands of consumers he does not know nor is likely ever to meet face to face, all of which is communicated by relative prices. The only reason the Lockean Proviso is satisfied is because “enough, and as good” land is left for producing leather because the relative price of baseball gloves rises, incentivizing the entrepreneur to slaughter a portion of his stock of cattle, thereby freeing up some land and other resources that otherwise could be used for raising dairy cows. This, in turn, satisfies the “non-spoilage” condition, because waste will be minimized in the overuse of land for the production of cattle in less-valued alternative uses, such as the production of milk for yogurt. Such waste is minimized by the fact that the relative price of baseball gloves is driving up the opportunity cost of raising cattle for milk that ultimately becomes yogurt.

From an economic perspective, it makes no difference, in a physical sense, whether we failed to use previously uncultivated land, or if we cultivated land in a manner that resulted in a lost opportunity to create value. In a sense, the distinction between “spoilage” and “waste” is *economically* irrelevant and can be illustrated in a context without market pricing. If an entrepreneur continues to raise cattle on the expectation that the price of baseball gloves has not increased, then he or she will leave land “uncultivated” in the sense of allocating land toward a lower-valued use,

namely in raising dairy cows, than in a relatively higher-valued consumer use, namely the raising of cattle for producing leather. Both the “enough, and as good” condition and the “non-spoilage” condition have been violated, showing that these conditions do not exist without one another.¹⁰ Land that otherwise had more high-valued consumer use in raising cattle for producing leather is left “uncultivated” by allocating such land for raising dairy cows. People only realize the “wasteful” use of this land because market pricing communicates to entrepreneurs, in the form of foregone profits, that “enough, and as good” of this land has not been left to satisfy more highly valued consumer uses.

The fundamental point here is not that private property rights are unjustified whenever “waste” or “spoilage” occurs, even if this distinction is considered irrelevant from an economic standpoint. Economically speaking, some waste is “efficient” given that eliminating it completely is costly. Rather, private property, market pricing, and profit-loss signals translate people’s appraisals of an object’s alternative uses into publicly available information that allows us to measure “waste.” In this respect, private property is the institutional prerequisite for the actual realization of the Lockean Proviso *ex post*, at a particular time and place. This is because private property rights generate the institutional precondition for market pricing and provide an inexpensive, impersonal, and lightning-quick communication system that encourages entrepreneurs to (re)allocate toward their most highly valued consumer uses.

Our example and the definition of waste provided here, in terms of opportunity cost, is not meant to suggest that a resource is wasted unless it is used for its most efficient purpose as would prevail under the conditions of equilibrium. As Brennan and Buchanan make this point: “In the absence of information about how the final outcome had been reached, there would be no reason at all to presume efficiency” ([1985] 2000, 22). This point is also relevant for how we understand the Lockean Proviso. In the absence of information, *ex ante*, about what “enough, and as good” and “non-spoilage” mean in an ideal, end-state of affairs, there is no reason to presume that the Lockean Proviso ever holds *ex post*. What matters for distributive justice is that individuals are free to discover new resources and free to correct prior errors by discovering entrepreneurial solutions when relative prices change. Thus, the relevant issue is not whether private property is justified in terms of the Lockean Proviso, but whether private property rights exist in the first place to establish the conditions for market pricing, which is necessary for *discovering* the conditions that satisfy the Lockean Proviso.

10. This point parallels another important, though neglected economic insight, raised by Ronald Coase (1938 [1981], 108): “To cover costs and to maximize profits are essentially two ways of expressing the same phenomenon.”

Conclusion

First-user appropriation of private property is defensible on many grounds. It leads to “more and better” by developing the system of exchange whereby people have incentives to buy, sell, trade, and produce (Carden 2018). The latecomer, not the original appropriator, is the lucky one (Schmidtz 1994). Beyond this, however, establishing private property rights allows us to define what a resource *is* as it brings it into a context where it can be used to satisfy definite wants, and profits and losses provide the information people need to correct errors. More important than the mixture of labor with an object is the *creation* of the object itself through entrepreneurial *discovery* and the relative valuation of the object with reference to people’s wants communicated through market pricing. Appropriation satisfies Locke’s “enough, and as good” proviso by initiating a discovery process that simultaneously satisfies the “non-spoilage” condition through market pricing.

Appropriation satisfies the “no waste” provision for the same reasons. “Waste” requires a standard of non-waste that shows the relationship between an object and its best use. Private property and exchange establish the reference points through market prices, with which appropriators have the wherewithal to detect and correct for “waste” with reference to preferences, beliefs, and expectations communicated through market pricing. In short, the criticism of appropriation as something leading to *waste* is invalid because it presupposes “waste” can be identified without reference to opportunity costs. Opportunity costs are revealed in action, and the indices—prices—that allow us to assess costs in a complex society with reference to others’ preferences and knowledge are formed through experimentation and exchange. Appropriation and exchange solve the problem of rivalry—and it is not always clear when an object is used the “right” way or what constitutes *waste*. Economic systems are defensible to the extent they allow people to compare alternatives with reference to others’ (often tacit or incomplete) knowledge. Systems based on private property pass the test.

References

- Alchian, Armen A. 1965. Some Economics of Property Rights. *Il Politico* 30, no. 4 (December): 816–29.
- Alchian, Armen A., and William R. Allen. 1972. *University Economics: Elements of Inquiry*, 3rd ed. Belmont, Calif.: Wadsworth Publishing.
- Allen, Douglas W. 1991. What Are Transaction Costs? *Research in Law and Economics*, 14:1–18.
- Anderson, Terry L., and Peter J. Hill. 2004. *The Not So Wild, Wild West: Property Rights on the Frontier*. Stanford: Stanford University Press.
- Barzel, Yoram. 1982. Measurement Cost and the Organization of Markets. *Journal of Law and Economics* 25, no. 1 (April): 27–48.

- Boettke, Peter J. 2018. *F. A. Hayek: Economics, Political Economy and Social Philosophy*. New York: Palgrave Macmillan.
- Boettke, Peter J., and Rosolino A. Candela. 2021. The Common Sense of Economics and Divergent Approaches in Economic Thought: A View from *Risk, Uncertainty, and Profit*. *Journal of Institutional Economics* 17, no. 6 (December): 1033–47.
- Brennan, Geoffrey, and James M. Buchanan. [1985] 2000. *The Collected Works of James M. Buchanan*, Vol. 10: *The Reason of Rules: Constitutional Political Economy*. Indianapolis: Liberty Fund.
- Buchanan, James M. [1982] 1999. Order Defined in the Process of Its Emergence. *The Collected Works of James M. Buchanan*, Vol. 1: *The Logical Foundations of Constitutional Liberty*, 244–45. Indianapolis: Liberty Fund.
- Burns, Scott, and Caleb S. Fuller. 2020. Institutions and Entrepreneurship: Pushing the Boundaries. *Quarterly Journal of Austrian Economics* 23, no. 3–4 (Fall/Winter): 568–612.
- Candela, Rosolino A. 2020. Are Markets Imperfect? Of Course, but That’s the Point! *The Library of Economics and Liberty*. May 18. At <https://www.econlib.org/are-markets-imperfect-of-course-but-thats-the-point/>.
- . 2021. Steve Pejovich’s Insights into Property Rights, Capitalism, Socialism and Freedom. *The Independent Review* 26, no. 2 (Fall): 307–13.
- Candela, Rosolino A., Peter J. Boettke, and Peter J. Jacobsen. 2023. Economic Calculation and Transaction Costs: The Case of the Airline Oversales Auction System. *Southern Economic Journal* 89, no. 3 (January): 708–31.
- Candela, Rosolino A., and Vincent J. Geloso. 2019. Coase and Transaction Costs Reconsidered: The Case of the English Lighthouse System. *European Journal of Law and Economics* 48, no. 3 (December): 331–49.
- . 2021. Trade or Raid: Acadian Settlers and Native Americans Before 1755. *Public Choice* 188, no. 3–4 (September): 549–75.
- Carden, Art. 2018. More and Better: Resources Defined through Property and Exchange. In *The Cambridge Handbook of Classical Liberal Thought*, edited by M. Todd Henderson, 37–46. Cambridge: Cambridge University Press.
- Coase, Ronald H. 1937. The Nature of the Firm. *Economica* 4, no. 16 (November), 386–405.
- . [1938] 1981. Business Organization and the Accountant. In *L.S.E. Essays on Cost*, edited by James M. Buchanan and G. F. Thirlby, 97–132. New York: New York University Press.
- . 1972. Durability and Monopoly. *Journal of Law & Economics* 15, no. 1 (April): 143–49.
- . 1992. The Institutional Structure of Production. *American Economic Review* 82, no. 4 (September): 713–19.
- Dahlman, Carl J. 1979. The Problem of Externality. *Journal of Law and Economics* 22, no. 1 (April): 141–62.
- Ekman, Mats. 2017. A Coasian Solution to Problems of Initial Acquisitions. *Erasmus Journal for Philosophy and Economics* 10, no. 2 (Autumn): 45–60.

- Furubotn, Eirik G., and Svetozar Pejovich. 1972. Property Rights and Economic Theory: A Survey of Recent Literature. *Journal of Economic Literature* 10, no. 4 (December): 1137–62.
- Hardin, Garrett. 1968. The Tragedy of the Commons. *Science* 162, no. 3859 (December): 1243–48.
- Hayek, F. A. 1937. Economics and Knowledge. *Economica* 4, no. 13 (February): 33–54.
- . 1945. The Use of Knowledge in Society. *American Economic Review* 35, no. 4 (September): 519–30.
- . 1948. *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hume, David. [1739] 1896. *A Treatise of Human Nature*. Oxford: Clarendon Press.
- Hutt, William Harold. [1936] 1990. *Economists and the Public: A Study of Competition and Opinion*. New Brunswick, N.J.: Transaction Publishers.
- Kirzner, Israel M. 1973. *Competition and Entrepreneurship*. Chicago: University of Chicago Press.
- Kirzner, Israel M. 1988. Some Ethical Implications for Capitalism of the Socialist Calculation Debate. *Social Philosophy & Policy* 6, no. 1 (Autumn): 165–82.
- . [1989] 2016. *The Collected Works of Israel M. Kirzner: Discovery, Capitalism, and Distributive Justice*, edited by Peter J. Boettke and Frédéric Sautet. Indianapolis: Liberty Fund.
- Klein, Peter G. 1999. Entrepreneurship and Corporate Governance. *Quarterly Journal of Austrian Economics* 2, no. 2 (June): 19–42.
- Kogelmann, Brian, and Benjamin G. Ogden. 2018. Enough and as Good: A Formal Model of Lockean First Appropriation. *American Journal of Political Science* 62, no. 3 (July): 682–94.
- Langlois, Richard N. 1992. Transaction-Cost Economics in Real Time. *Industrial and Corporate Change* 1, no. 1 (January): 99–127.
- Locke, John. [1690] 1980. *Second Treatise of Government*, edited by C. B. Macpherson. Indianapolis: Hackett Publishing.
- Mack, Erick. 1995. The Self-Ownership Proviso: A New and Improved Lockean Proviso. *Social Philosophy and Policy* 12, no. 1 (Winter): 186–218.
- . 2009. *John Locke*. New York: Continuum.
- Mautner, Thomas. 1982. Locke on Original Appropriation. *American Philosophy Quarterly* 19, no. 3 (July): 259–70.
- Menger, Carl. [1871] 1981. *Principles of Economics*. New York: New York University Press.
- Mises, Ludwig von. [1920] 1975. Economic Calculation in the Socialist Commonwealth. In *Collectivist Economic Planning*, edited by F. A. Hayek, 87–130. Clifton, N.J.: Augustus M. Kelley.
- . [1922] 1951. *Socialism: An Economic and Sociological Analysis*. New Haven: Yale University Press.
- . [1949] 2007. *Human Action: A Treatise on Economics*, 4th ed. Indianapolis: Liberty Fund.

- Munger, Michael C. 2018. *Tomorrow 3.0: Transaction Cost and the Sharing Economy*. New York: Cambridge University Press.
- North, Douglass C. 1990. *Institutions, Institutional Change, and Economic Performance*. New York: Cambridge University Press.
- Nozick, Robert. 1974. *Anarchy, State, and Utopia*. New York: Basic Books.
- Ostrom, Elinor. 2010. Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *American Economic Review* 100, no. 3: 641–72.
- Pejovich, Svetozar. 2003. Understanding the Transaction Costs of Transition: It's the Culture, Stupid. *Review of Austrian Economics* 16, no. 4 (December): 347–61.
- . 2012. Socialism Is Dead, Long Live Socialism. *Journal of Public Finance and Public Choice* 30, no. 1–3: 3–16.
- Piano, Ennio E., and Louis Rouanet. 2020. Economic Calculation and the Organization of Markets. *Review of Austrian Economics* 33, no. 3 (September): 331–48.
- Rasmussen, Douglas B., and Douglas J. Den Uyl. 1991. *Liberty and Nature: An Aristotelian Defense of Liberal Order*. La Salle, Ill.: Open Court.
- . 2005. *Norms of Liberty: A Perfectionist Basis for Non-Perfectionist Politics*. University Park: Penn State University Press.
- Schmidtz, David. 1990. When Is Original Appropriation Required? *Monist* 73, no. 4: 504–18.
- . 1994. The Institution of Property. *Social Philosophy & Policy* 11, no. 2: 42–62.
- Simon, Julian. 1981. *The Ultimate Resource*. Princeton: Princeton University Press.
- Sowell, Thomas. 1980. *Knowledge and Decisions*. New York: Basic Books.
- Tebble, Adam J. 2020. On the Circumstances of Justice. *European Journal of Political Theory* 19, no. 1 (January): 3–25.
- Vaughn, Karen Iversen. 1980. *John Locke: Economist and Social Scientist*. Chicago: University of Chicago Press.
- Waldron, Jeremy. 1979. Enough and as Good Left for Others. *Philosophy Quarterly* 19, no. 117 (October): 319–28.
- Wallis, John J., and Douglass C. North. 1986. Measuring the Transaction Sector in the American Economy, 1870–1970. In *Long-Term Factors in American Economic Growth*, edited by Stanley L. Engerman and Robert E. Gallman, 95–162. Chicago: University of Chicago Press.
- Williamson, Oliver E. 1979. Transaction-Cost Economics: The Governance of Contractual Relations. *Journal of Law & Economics* 22, no. 2 (October): 233–61.
- . 1991. Economic Institutions: Spontaneous and Intentional Governance. *Journal of Law, Economics, & Organization* 7 (January): 159–87.

Acknowledgments: We wish to thank Robert Whaples and two anonymous referees for excellent feedback and comments that greatly improved earlier drafts of this paper. We are also grateful for comments and feedback from Peter Boettke. Any remaining errors are entirely our own. An earlier version of the paper appeared as Independent Institute Working Paper 82.

SUBSCRIBE NOW AND RECEIVE A FREE BOOK!



“*The Independent Review* does not accept pronouncements of government officials nor the conventional wisdom at face value.”

—**JOHN R. MACARTHUR**, Publisher, *Harper’s*

“*The Independent Review* is excellent.”

—**GARY BECKER**, Nobel Laureate in Economic Sciences

Subscribe to [The Independent Review](#) and receive a free book of your choice such as *Liberty in Peril: Democracy and Power in American History*, by Randall G. Holcombe.

Thought-provoking and educational, [The Independent Review](#) is blazing the way toward informed debate. This quarterly journal offers leading-edge insights on today’s most critical issues in economics, healthcare, education, the environment, energy, defense, law, history, political science, philosophy, and sociology.

Student? Educator? Journalist? Business or civic leader? Engaged citizen? This journal is for YOU!



Order today for more **FREE** book options

SUBSCRIBE

The Independent Review is now available digitally on mobile devices and tablets via the Apple/Android App Stores and Magzter. Subscriptions and single issues start at \$2.99. [Learn More.](#)

