

**PROPERTY RIGHTS AND
GOVERNANCE STRATEGIES:
HOW BEST TO DEAL WITH LAND,
WATER, INTELLECTUAL PROPERTY,
AND SPECTRUM**

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INTRODUCTION

One of the distinctive features of the Silicon Flatirons Conference, both this year¹ and last,² is that it rightly focuses on how legal rules of property should be adapted to deal with different forms of resources, which have in common some, but not all attributes. With Silicon Flatirons, the discussion often turns to water, minerals, and intellectual

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1. *Exploring Governance Strategies for the Public Domain/Commons in Intellectual Property, Wireless Spectrum, and Water Rights*, SILICON FLATIRONS CTR. (Mar. 12, 2015), <http://www.silicon-flatirons.org/events.php?id=1496>.

2. *Property Rights in Spectrum, Water, and Minerals*, SILICON FLATIRONS CTR. (Apr. 3, 2014), <http://www.silicon-flatirons.org/events.php?id=1429>. For the article based on the remarks I gave at the 2014 conference, which is in a sense a companion to this essay, see Richard A. Epstein, *Property Rights in Water, Spectrum, and Minerals*, 86 COLO. L. REV. 389 (2015).

property. Yet ironically, property rights in land—perhaps the oldest area of property rights—frequently are not at the center of this discussion, even though everyone knows that the land paradigm is typically the reference point from which comparisons to other forms of property are made. So to start this essay, I will bring land back into the picture because it allows a clearer examination of one central challenge to all property systems: how we think about the distribution between private and common rights with respect to various forms of property. Some people will say this is a very modern question, but of course, it is not. If you go back and you read Justinian, it begins the discussion of property with the discussion of *res communis*, which is property that is open to all in the state of nature, and the *res nullius*, which is property that is owned by no one, but that can be acquired by a single individual through occupation or possession of some sort.³ Justinian offers the water, the beach, and the air as illustrations of *res communis*, just as he gives land, chattels, and animals as instances of a *res nullius*.⁴

There is a lesson here. The two terms, *res communis* and *res nullius*, should never be conflated. A *res communis* refers to a communal resource, or more precisely, a resource open to all persons in the state of nature, where no person is entitled unilaterally to reduce it to private ownership by individual occupation. A *res nullius* refers to a thing owned by no one, which is, however, in fact capable of being reduced to private ownership through occupation of land, seizure of chattels, or capturing animals.

The real challenge is to decide which assets have been and should be placed into one box instead of the other and to develop an explanation as to why. In the typical ancient legal systems, the lack of a precise answer led jurists to say that their conclusions were a function of at least two things. One of these is natural reason, by which they meant the powers of deduction. The other turns out to be custom—or the accumulated practices over time—either within or across communities, reflected in learned treatises and applied in individual cases. On this view, one must first ask what system of property has been ingrained in law and practice from the beginning of time. Thereafter, one must ask this very difficult question: What tradeoffs lead to putting resources on either side of the private/commons line? The problem is still more complicated because in some instances, most notably involving water and some forms of intellectual property, the proper integration of *both* private and common rights is part of any stable property rights solution.

3. See JUSTINIAN I, JUSTINIAN'S INSTITUTES 55 (Peter Birks & Grant McLeod trans., 1987) (533) (discussing the classification of things).

4. See *id.*

It turns out there is a fairly interesting way to describe the problem, one that essentially retraces the eternal battle between the externality problem on the one side and the holdout problem on the other. Whenever anyone either creates or finds something, his actions necessarily have spillover effects on the activities, both individual and collective, of other individuals. Sometimes these externalities are positive, at which point there is little concern with rectification. But often in a world of scarcity, these externalities are negative, so the question arises whether the losses of that outsider from exclusion should be regarded as “actionable” or “cognizable” externalities. Those odd terms are an essential part of the legal and social mix, and it would be clearly an impossible universe if anyone could sue anyone else for actions that leave him worse off in economic terms. Indeed, one of the great advantages of private property is that it gives its owner the incentives to preserve and develop that property, a benefit that would be clearly lost if others could harvest where he has sown. There is a need to preserve these productive activities, so the trick, therefore, is to narrow down the definition of externality for legal purposes so that it covers only a smallish subset of the full range of harmful human behaviors. This exercise requires serious limitations be imposed on John Stuart Mill’s harm principle, “the only purpose for which power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others.”⁵

In general, the correct way to narrow the harm principle is to concentrate not on harm generally, but first on force and fraud, so as to exclude from the legal catalog of actions any that purport to supply redress to competitive losses in a market economy. The explanation is that any private dispute between two parties should be resolved in ways that reflect the gains to overall social welfare. Force and fraud correlate well with social losses. In contrast, competitive losses are usually inversely related to social welfare, given the general efficiency gains from the operation of competitive markets.

The situation is somewhat different with respect to the commons because, in the simplest open-access regimes referred to by Justinian, all may enter but none may exclude others. At this point, the harm comes not from being excluded but from the risk of overuse and congestion when there is no way to keep individuals out—the very problem that systems of private property tend to avoid. Whenever the intensity of use is low, normally there is little reason to develop institutions and practices that attend to these problems. But as the intensity of use becomes larger,

5. JOHN STUART MILL, ON LIBERTY 9 (London, John W. Parker & Son, West Strand 1859). For my critique, see Richard A. Epstein, *The Harm Principle—And How it Grew*, 45 U. TORONTO L.J. 369 (1995).

some other solution is often needed. In some cases, the use of commons is limited to the designated individuals who can enter it, and they in turn can, by agreement or custom, devise some practices to deal with congestion and overuse. In some cases, privatization may supply an answer, but in other situations where transportation or communications are essential, the appropriate solution may involve some regulation of the commons that continues to allow access while denying unlimited use. To put it another way, the simple Roman definition of the *res communis* takes place in an institutional void, which sooner or later has to be filled by some public governance structure.

Why? Because using public governance becomes the lesser of two evils. Allowing privatization in the domains of communication and transportation may create an alternative difficulty—namely the blockade problem. If we want to configure a river so that it is owned privately by a group of individuals, the value of the river as a means for transportation from top to bottom plummets. If one person can block it here, another can block it there, and a third can block it somewhere else, it is virtually impossible to organize a set of bargains that will restore open access over the length of the river. What is needed, therefore, is a mixed regime that provides both open access on the one hand, and public management on the other. That can only happen if we deviate from the original *res communis*, which guaranteed open access but nothing more. At this point the question is how to best deviate from the polar case—like the good tailor who has a tuck here and a hem there—to move from the natural law to some more complex hybrid system. If so, we have to talk about something that nobody seems to want to talk about today: whether payment of just compensation is a sensible mechanism when there is a social need to redefine rights when, as with travel by water, and later by air, earlier legal regimes become obsolescent or inefficient.

If you want to understand the interdependence of the distribution between the commons and private spaces, it is often helpful to think about how the human body (indeed those of all advanced animals) serves as a template for larger social structures. We basically have two kinds of systems in our bodies: the long and skinny, and the short and squat. The long and skinny are the neural systems and the blood systems: information and nutrition, as it were. The short and squat are the organs that have various kinds of specialization: bodily factories like livers, hearts and lungs. If you do not have the long and skinny, there is no way in which you can coordinate activities between solid organs; there is also no way in which you can keep supplying them with the fuel that they need to run. But if you only have a bunch of roadways going back and forth, there will be no productive sites that will allow for digestion, mentation, and all vital bodily functions. So the body basically organizes

itself by evolutionary forces into a commons, which is designed to deal with the communications and transportation, and the solid organs, which essentially allow for specialized development of the activities for survival.

With these preliminaries in place, I am going to take the three topics we discussed and treat them in order of their historical evolution, with the greatest emphasis upon the emergence of governance systems for water through the public trust doctrine. There was no Roman law of patents and copyrights; one paid people to copy things, and invention was not an organized science. So those are historically not the first fields to address. That first field is water law, in which there is a very strong ancient body of rules. Patents and other forms of intellectual property come next, and spectrum comes third, each with its distinctive problems.

I. THE EVOLUTION OF WATER LAW

A. *The Rise of The Public Trust*

The discussion of the distribution of functions in the body helps organize the discussion of the role of public and private property. Thus, when you start looking at a society under *ius naturale*—that is, the law and practices before sovereign power is established—that basic pattern still holds. It turns out that rivers and beaches and trails are long and skinny—these are the ways in which societies connect different individuals. If you allow for their privatization, there is very little that can be done to secure trade between individuals, each pinned to their own little island. Getting gains from trade depends on more than joint consent. It also depends on having a solid common infrastructure, which allows for transactions of goods and services supplied by specialized actors.

It follows, of course, that there is an enormous amount of harm that one can do by way of blockade. The initial position in virtually all of these cases is that long and skinny things are open to all. Well, what do we mean by “all” in the original situation? Remember the term “*ius naturale*,” which means that all political societies must accept these basic norms to flourish.⁶ In ancient times, this was not easy to do. In that setting, the options to create property rights tend to be sharply limited, chiefly to rules that either give absolute priority, as with the acquisition of land chattels, or complete parity, as with water and air.⁷ So open to

6. For a modern discussion that goes back to Roman roots, see Samuel Gregg, *Natural Law and the Law of Nations*, NAT. L., NAT. RTS., & AM. CONSTITUTIONALISM (2011), <http://www.nlnrac.org/earlymodern/law-of-nations>.

7. For a development of this theme, see Richard A. Epstein, *How Spontaneous? How*

“all” under these circumstances means anybody in the entire world. What happened early on was, with densities being relatively low, people would go back and forth, up and down a river, one way or another. As mentioned earlier, there was very little organization of the commons, for as a general rule there is no need to organize the commons when its intensity of use is low. So, nobody really tried to figure out how to manage the commons under these early systems because the issue never came up. With private property, on the other hand, you develop, divide, and trade it, and so forth. The early legal rules on private property talk about exclusive use and the ability to develop, sell and mortgage, and the like.

Now these are first approximations; later comes the question of making changes. And certainly with respect to rivers, everybody wanted change because there was a sense that if one could simply use the waters for transportation, but could not drink from them, and could not fish and so forth, then in effect the inability to make these constructive, separate, consumptive uses of a common asset would sharply reduce its aggregate social value.

People developed very intuitive systems, beginning with the riparian systems. The first question is how much water can be taken out of a river without destroying its essential nature.⁸ Then you prorate those particular uses among the riparians by way of a customary law, because when you have large numbers of people along a river, it is simply impossible for them to agree contractually on a particular form of allocation. Historically what develops is a focal-point equilibrium, in which proration turns out to be the dominant theme. But that task is always challenging because rivers flow in one direction, such that serious asymmetries separate people at the top from those at the bottom. There is the possibility that the riparians at the top can remove all the water, if left unhindered. But just as that solution is undesirable, so too is any solution that lets the people on the bottom insist that it all come to them unimpeded. How best then to maintain proration in the face of this asymmetry? Although the general rules of “open access” with their stress on fair participation do not answer the question decisively, they at least alert everyone to the basic trade-offs that have to be made.⁹

With respect to land, it turns out there are also approximations. At

Regulated? The Evolution of Property Rights Systems, 100 IOWA L. REV. 2341 (2015).

8. For a longer discussion, see Epstein, *supra* note 2, at 399–404.

9. *Dumont v. Kellogg*, 29 Mich. 420, 423 (1874) (“It is a fair participation and a reasonable use by each that the law seeks to protect.” The asymmetries create difficulties for imposing, noting sharp limitations on any use by the upper riparian “would give to the lower proprietor superior advantages over the upper, and in many cases give him in effect a monopoly of the stream.”).

the borderline, many times we have reciprocal obligations of support so that I can build on my land and you can build on yours, but we cannot excavate our land in such a way that our neighbor's land falls in.¹⁰ So, again, what we do is start with the isolated boundary line, and then we soften it.¹¹ The theory is that each and every one of these alterations that we create—largely by customary law as if in a state of nature—leaves both parties better off than they would have been in the land case, and leaves everybody using the river better off than they would have been if blockades and complete diversions were permitted.¹²

It is often said that the origins of the public trust doctrine lie in Roman law. The applicable passage, contained in *Institutes: Book Two, Section 1* (“The Classification of Things”) reads:

The things which are naturally everybody's are: air, flowing water, the sea, and the sea-shore. So nobody can be stopped from going on to the sea-shore. But he must keep away from houses, monuments, and buildings. Unlike the sea, right to those things are not determined by the law of all peoples.¹³

In *National Audubon Society v. Superior Court of Alpine County*,¹⁴ the court quotes the first of these two sentences, but not the other two: “From this origin in Roman law, the English common law evolved the concept of the public trust, under which the sovereign owns all of its navigable waterways and the lands lying beneath them as trustee of a public trust for the benefit of the people.”¹⁵ It is important to note that the evolution in question requires a major transformation from the earlier law. In the Latin passage, the initial words “things which are naturally everybody's” (*naturali iure communia sunt omnium haec*) show the gulf between the original notion of open access that puts certain elements into the public domain and a public trust document that requires a sovereign with exclusive powers (of which there is none in the state of nature) to manage and maintain those assets for its trust beneficiary—the public at large. The first point to note here is that in the full original passage some assets are kept consciously out of the commons. Why? Because houses,

10. For these rules, see, e.g., *Birmingham v. Allen*, L.R. 6 Ch.D. 284 (1877).

11. For a more detailed discussion, see RICHARD A. EPSTEIN, *PRINCIPLES FOR A FREE SOCIETY: RECONCILING INDIVIDUAL LIBERTY WITH THE COMMON GOOD* 186–213, (1998) (pages 186–87 are particularly relevant).

12. For a more extended discussion, see Richard A. Epstein, *Nuisance Law: Corrective Justice and Its Utilitarian Constraints*, 8 J. LEGAL STUD. 49 (1979).

13. JUSTINIAN I, *supra* note 3, at 55.

14. *Nat'l Audubon Soc'y v. Super. Ct. of Alpine Cty.*, 658 P.2d 709 (Cal. 1983) (en banc).

15. *Id.* at 718 (internal quotation marks omitted).

monuments, and buildings gain their value precisely because they increase in value when in the hands of a single owner. All of the elements that are put into the common domain—the air, running water, the sea, and consequentially the shores of the sea—are in general more valuable as conduits for connection among people. Of these the beach is instructive because, in general, it affords an easy means to go from one place to another. But here the intersection with private uses remains. It is said that under the law of nations “[a]nyone is free to put up a hut there to shelter himself. He can dry his nets, or beach his boat.”¹⁶ The use of the word “hut” (*casam*) indicates some short-term shelter that is never allowed to block free movement across the beach. In effect, this simple passage illustrates the point. Private uses of the beach are tolerated because they do not interfere with movement along the beach. But the creation of any permanent structure is not tolerated because it would interfere with free movement, which is why it is said, “ownership of these shores is vested in no one at all.”¹⁷ The system will not work if unilateral privatization of the commons is allowed.

The Roman rules on open access therefore illustrate the limits that operate on its edges. But what remains to be explained is the critical conversion from that open access regime in the state of nature to the public trust doctrine, which necessarily requires a sovereign to run the operation. So why put any sovereign in charge, and what is that sovereign supposed to do? The explanation turns out to be roughly as follows.

When you start with a river in a state of nature, two key points are established. First, everyone can use it, and no one can divert the entire corpus for his or her private use. Second, by implication no one can treat the river as a dumping ground for private waste—a point which is not clear from the earliest texts but becomes clear when private suits for nuisances are allowed for discharges into rivers, but only by lower riparians in defense of their property rights.¹⁸ Stated otherwise, the rule of ownership through initial occupancy, which is the rule for *res nullius* that is explicitly rejected for *res communis*, means that no unilateral acts by an individual are allowed to divert or drain the river for private advantage. These two rules go a long way toward maximizing the social value of the resource at hand. But by the same token, there is a powerful upper bound as to what these two general prescriptions can do. For example, in a state of nature, no one is under an obligation to maintain the resource. And it follows that intense use creates the risk of collision,

16. JUSTINIAN I, *supra* note 3, at 55.

17. *Id.*

18. *See, e.g.,* *Strobel v. Kerr Salt Co.*, 58 N.E. 142 (N.Y. App. 1900).

congestion, confusion, or worse.¹⁹ So eventually somebody says, and everyone recognizes, the need to control the commons—not to exclude people, but to organize their activities so as to maximize the value of their combined use.

Yet who can discharge that duty? A quick review of a list of private parties shows that none of them is ideally suited for managing the river in its entirety. Any river will have a large number of riparian claimants, none of which has control over more than a small fraction of the total river resource.²⁰ With no clear answer to which one should take over and why, the default position is to turn to the sovereign that the political system has already endowed with monopoly force within the jurisdiction. Ideally, the actions of that sovereign are subject to some powerful limitations, so that it cannot behave as though it owns the entire world, and all its people. The use of the term “public trust” hearkens back to the standard law of fiduciary duties, which means that the person in power has to look after and protect the interests of his beneficiaries.²¹ As this stylized history suggests, here is one occasion in which it pays to be *literal* in thinking about how these trust operations work. That notion of a trust is key in the private law, where it connotes a situation where the trustees (often plural) are required to manage trust assets for the benefit of others. The trust relationship is used in partnership and corporate arrangements, and of course in private trust arrangements. Trillions of dollars of assets in all forms are managed through the trust, so the standard terms and incidents associated with its operation have been well specified in these areas.²² These relationships in turn serve as the template by which to lay out the fiduciary duties incumbent on the sovereign as the public trustee. In private law, the trustee is entitled to receive a fee for service. But it is important that the accounts be kept separate so that the fee constitutes the sole payment, without additional undisclosed benefits. The trustee is not entitled to help himself to the fruits of the trust property. Although public trustees are entitled to payment at market rates for services rendered, the king (originally), or

19. Amy Sinden, *The Tragedy of the Commons and the Myth of a Private Property Solution*, 78 U. COLO. L. REV. 533, 534–35 (2007).

20. Epstein, *supra* note 2, at 401.

21. The leading statement of fiduciary duty is still *Meinhard v. Salmon*, 164 N.E. 545, 546 (1928) (“Joint adventurers, like copartners, owe to one another, while the enterprise continues, the duty of the finest loyalty. Many forms of conduct permissible in a workaday world for those acting at arm’s length, are forbidden to those bound by fiduciary ties. A trustee is held to something stricter than the morals of the market place. Not honesty alone, but the punctilio of an honor the most sensitive, is then the standard of behavior.”).

22. The precision in the field is well captured by the standard glossaries of key terms. See *Glossary of Estate Planning Terms*, AM. BAR ASS’N, http://www.americanbar.org/groups/real_property_trust_estate/resources/estate_planning/glossary.html (last visited Apr. 21, 2016).

the state (more recently), is not entitled to treat those public trust assets as though they were private property.²³

The phrase “public trust” is therefore well chosen to handle the new set of practices. The trust suggests the nature of the fiduciary operations and the word “public” makes it clear that there is a large and shifting population of beneficiaries, which includes everyone in the public. But who is everyone? At this point there is yet another complication. In the state of nature, the want of a state implies that there are no subjects or citizens of either a monarchy or a democracy. When something is open to the public, therefore, it is open to everyone in the world, without regard to who they are or where they live. The notion of nationality plays no role at all in the original state-of-nature analysis. But once there is a sovereign, there is necessarily a territory that the sovereign controls, and that territory necessarily has its subjects or citizens, so the question that then arises asks the extent to which the state can, in its control of public resources, give preferences to its own citizens.

The attitude on this question is sharply divided. In principle, the subjects and citizens have a leg up. In practice, if the only question is access, then anyone, whether citizen or alien, who is lawfully in the territory has access. But the legal rules have often taken a different turn, giving citizens preferences that could not exist in the law of nature. Thus, in *McCready v. Virginia*, the Supreme Court held that the state could prohibit outsiders from planting oysters in Virginia tidewaters.²⁴ That decision followed in a sense from the earlier decision in *Corfield v. Coryell*, in which Justice Washington, while riding circuit, held that the Privileges and Immunities Clause of Article IV did not include the right to plant oysters in the common waters of the state as a privilege or immunity that was open on equal terms to outsiders.²⁵ The positive law thus places a powerful constraint on the natural law. In general, it is not likely to bind with respect to recreational uses. But it is likely to bite in cases like the oysters, where the question is who gets to collect the fish and other animal life in public trust lands and waters. In my view, the correct position is that when the stakes get high, these property rights—including rights to collect fish and oysters—should be sold off at auction to maximize the value of the take for the state, which requires that the outsiders normally be allowed to bid, even if they do not share in the gains from sale. The point here is that no one would be happy if a sale of corporate assets were restricted to bids from existing shareholders, as

23. For an explanation of the origins of the Public Trust Doctrine and criticism of its modern development, see Lloyd R. Cohen, *The Public Trust Doctrine: An Economic Perspective*, 29 CAL. W. L. REV. 239 (1992).

24. *McCready v. Virginia*, 94 U.S. 391, 395 (1876).

25. *Corfield v. Coryell*, 6 F. Cas. 546, 551–52 (No. 3,230) (C.C.E.D. Pa. 1823).

opposed to everyone else. The price of the asset should increase as the range of bidders increases, which could work to the advantage of all citizens who divide the proceeds from the sale or lease. Once again, the parallels to private trusts illuminate the public trust doctrine.

In dealing with more complex systems, the analysis is still harder, because the articulation of the public trust doctrine is supposed to give new possibilities to everyone who uses the common resources. But it also requires the collection of revenues, whether raised by taxes or user fees, to maintain those collective activities. In principle, the ideal transformation from an open access regime to a public trust regime should take the form of a Pareto improvement, which means that everyone who had access to the initial common resource in the state of nature is left at least as well off after the change to a public trust regime is accomplished.²⁶ That result in turn requires that the improvements of overall operations, less the fractional share of the collective expenses, leave everyone better off than before.

To step back a moment, this tradeoff is similar to that made more generally under social contract theory in moving from a state of nature into a civilized nation: the gains from political society exceed their costs for each person, and thus necessarily for the whole. Indeed, ideally, it is preferable that the gains in question be proportionate for all persons, so as to avoid the jockeying that comes from giving some individuals a larger fraction of a larger pie than others.²⁷ It is no little exaggeration to say that the execution of the public trust raises major problems on all fronts. Who pays the taxes or fees? How are they to be spent? And who gets access to what part of the system? If it turns out that the balance is altered in some substantial way, then, as the night follows the day, the question will arise whether a specific government action, pursuant to its public trust powers, constitutes a taking of the private rights that ordinary people enjoyed previously in the state of nature. It is at this point that there is an instructive lesson from the intersection between American common and constitutional law, to which I now turn, in dealing with the creation of the public trust and its relationship to the navigation servitude.

The most important case dealing with the public trust doctrine under

26. A Pareto improvement is defined in neoclassical economics as “an action done in an economy that harms no one and helps at least one person. The theory suggests that Pareto improvements will keep adding to the economy until it achieves a Pareto equilibrium, where no more Pareto improvements can be made.” *Pareto Improvement*, INVESTOPEDIA, <http://www.investopedia.com/terms/p/paretoimprovement.asp> (last visited Apr. 24, 2016).

27. For a long exposition of this point in connection with the doctrine of unconstitutional conditions, see RICHARD A. EPSTEIN, *BARGAINING WITH THE STATE* (1993).

American law is *Illinois Central Railroad Co. v. Illinois*,²⁸ the complex history of which has been chronicled with great insight by Joseph Kearney and Thomas Merrill.²⁹ They explain in detail the institutional complications and political challenges that gave rise to this controversial deal, which in 1869 deeded large portions of the waterfront on Lake Michigan, south of the entry point of the Chicago River into the lake. The best way to understand what has gone wrong with the American version is to note two features. The first is the extent to which the public trust doctrine follows the private law, and the second is where it deviates from it.

One of the first management duties associated with a trust is to protect trust assets against looting and theft by others, and the same rule applies to water cases. In dealing with water, the ultimate wrong is diverting or damming up a river or lake so that all downstream parties are shut out. One of the functions of the public trustee is to prevent just those dissipations. The point is well illustrated in *National Audubon*, where the challenge that faced California was keeping up the water levels in Mono Lake in the face of diversions of large amounts of water to serve the various metropolitan areas from a saltwater lake that supported substantial populations of brine shrimp, which are in turn the food for the large number of migratory birds that flew over the area.³⁰ The protection of those birds in turn required the maintenance of islands, which could not be reached by coyotes, their natural predators.³¹ When the water levels started to fall, the entire cycle started to implode, so the public trust doctrine was properly invoked, even if its transformation from Roman law was not fully understood.³²

The question is how best to deal with these diversions. One Roman maxim of immense importance is *aqua currit et debet currere ut currere solebat* (“water runs and ought to run as it is accustomed to run”).³³ In effect, that maxim bridges the gap between “is” and “ought” by using the natural baseline against which to measure diversions. One clear advantage of this system is that it reduces the stress on the legal system to find, or manufacture, some independent baseline, which is both costly to define in the best of circumstances and in practice is subject to political intrigue. A second is that the historical baseline is not likely to

28. Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387 (1892).

29. Joseph D. Kearney & Thomas W. Merrill, *The Origins of the American Public Trust Doctrine: What Really Happened in Illinois Central*, 71 U. CHI. L. REV. 799 (2004).

30. Nat'l Audubon Soc'y v. Super. Ct. of Alpine Cty., 658 P.2d 709, 713–18 (Cal. 1983).

31. *Id.*

32. *Id.* at 732.

33. For its use in modern American law, see *Keys v. Romley*, 412 P.2d 529, 532–33 (Cal. 1966).

be arbitrary relative to its environment, because the flora and fauna have long adapted to it, so that there is good reason to think it is a good first approximation to a sensible long-term equilibrium, which it is with Mono Lake.

When the stakes are low it usually pays to just follow this maxim, without any effort to further fine-tune. But that need not be the case with high-stakes ventures like Mono Lake, and the ultimate settlement reached in that case reflected the basic need to tolerate incremental adjustments.³⁴ At this point, it was too costly to get immediately back to the pre-diversion levels, so the parties devised a schedule by which the water levels were allowed to rise until they reached a point where the diversions could then be allowed to increase. There was no cash compensation in this situation, doubtless because of the clouded nature of the doctrinal experiment. But in principle, some compensation for the diverted water seems appropriate under the standard public choice argument. The easiest way to achieve that result is to put the water up to bid, so there is both compensation to the system for its losses and an effort to direct the water to its highest-value uses, which need not take place under the existing settlement.

The duties of the standard trustee go beyond the protection of trust assets from expropriation, for they also cover the sound management of the assets subject to the trust, which usually includes the power to buy, sell, and trade trust assets. The argument against any such exchanges is that the trustee could abuse the power and leave the trust beneficiaries worse off than before. But that capacity to mismanage assets is every bit as great with the management and preservation of existing assets as it is with their sale or exchange. After all, in any version, the trustee has to be allowed to grant licenses for various individuals and groups to enter, to set the fees that are charged, and, where appropriate, to create leases of various bits of trust property so as to allow for fishing, sailing, boating, and the like. At this point, the costs of forcing a trustee to keep an unbalanced or under-diversified portfolio of assets are very high. Private trusts, of course, have different assets. Some only contain financial assets, while others contain operating assets that can include everything from factories, mines, hotels, apartments, and much more. With both management and operations, there is ample room for gains from trade, just as there is with assets that people own outright in their own name.

What is striking about the position in *Illinois Central* is that it takes

34. As reported in ROBERT W. ADLER, ROBIN K. CRAIG & NOAH D. HALL, MODERN WATER LAW: PRIVATE PROPERTY, PUBLIC RIGHTS, AND ENVIRONMENTAL PROTECTION 333–375 (2013). For detailed information, see *Today at Mono Lake*, MONO LAKE COMMITTEE, <http://www.monolake.org/today/water> (last visited Apr. 26, 2016).

the view that it is illegal for the state to sell any public trust asset to private parties.³⁵ In the context of that case, this conclusion, according to Justice Field, allowed the state to revoke the grant to the Illinois Railroad years after it was made, notwithstanding any changes in position that the Railroad took in reliance on the deal. The Field position received a huge boost of support from the late Joseph Sax, who looked with great suspicion on any transaction entered into by government and private parties.³⁶ This presumption should, however, never be made absolute, for it turns out to create dangerously restrictive rules for government actors. Sometimes, keeping assets under public management is more efficient than placing them in private hands, and what you need to do is to have the same tests for fair value that are used in corporate transactions where there is any hint of self-dealing. This is a rule that says “nor shall public property be transferred to private use without just compensation.”³⁷

The theory behind this rule is that it is unwise to let the state just give away natural resources. Nonetheless, if in fact the balance, when all things are looked at, leaves the public better off making the transfer than without it, with or without compensation, then the deal should go forward because it creates a general Pareto improvement. To be sure, even the dangers of self-dealing do not justify the total prohibition on alienation, any more than in corporate contexts. The correct rule is the “fair value” rule, whereby an independent assessment is made to ensure that the state gets an equivalent for the goods that it swaps out to the private party. If so, then the mutual-gain condition for exchange is satisfied, and again it makes sense for the deal to go forward.

I have no doubt that it is often more difficult to apply these tests to public assets than to private ones. But those differences are at best matters of degree. The serious fear here is that the very rigid governance structure for public trust assets leaves too much on the table. One recent illustration of the problem is *Lake Michigan Federation v. United States Army Corps of Engineers*, where the question was whether it was permissible for the Army Corps to allow the development of an 18.5-acre tract of land by a lakefront property holder, Loyola University of Chicago.³⁸ Allowing the development would have vastly improved the

35. Ill. Cent. R.R. Co. v. Illinois, 146 U.S 387, 453 (1892) (“The trust devolving upon the State for the public, and which can only be discharged by the management and control of property in which the public has an interest, cannot be relinquished by a transfer of the property. The control of the State for the purposes of the trust can never be lost, except as to such parcels as are used in promoting the interests of the public therein, or can be disposed of without any substantial impairment of the public interest in the lands and waters remaining.”).

36. See generally Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970).

37. Richard A. Epstein, *The Public Trust Doctrine*, 7 CATO J. 411, 417 (1987).

38. *Lake Mich. Fed’n v. U.S. Army Corps of Eng’rs*, 742 F. Supp. 441, 442 (N.D. Ill.

operations of the University, itself a charitable institution, and would have created over two acres of public improvements along a stone revetment with a walking and bike path. Anything that passes muster with the Corps is likely to have a huge positive gain. Under current administrative law, the usual decisions are evaluated under an “arbitrary and capricious” standard, which in this case tracks the business judgment rule, which is applicable in a corporate case where there is no trace of self-dealing.³⁹

Regrettably, the issue never got that far, as Judge Aspen held that the *per se* prohibition of the public trust doctrine stopped the deal in its tracks.⁴⁰ But one can scour the entire decision without ever asking whether this deal made sense. In this instance, the Lake Michigan Federation was allowed to play the spoiler. It was as if a single beneficiary under a private trust could stop a deal with an expected positive sum. Judge Aspen claimed that the overall transaction had some public benefit, but that it was prohibited because it was entered into largely for a private interest, namely Loyola.⁴¹ But that conclusion reflects near-sighted accounting. Private benefits count as part of the overall social gain and loss, and that is especially true for charitable organizations that themselves have fiduciary duties. It seems quite clear that today’s governance structure for the public trust is in this regard sadly deficient.

A second problem with the public trust doctrine is that in some instances it allows the public to trample ordinary private interests. Historically the most vivid illustration of this problem lies with the expansion of the navigation servitude under federal law, for which there is a state law analogue of navigability that operates along the same principles.⁴² One of the great achievements in the historical evolution of land law was the separation of the notion of ownership from that of sovereignty. The two had been fused together at the time of William the Conqueror in 1066, and that merger only came to its end with the

1990).

39. Cornell Univ. Law Sch., *Business Judgment Rule*, LEGAL INFO. INST., https://www.law.cornell.edu/wex/business_judgment_rule (last visited Apr. 26, 2016) (“In suits alleging a corporation’s director violated his duty of care to the company, courts will evaluate the case based on the business judgment rule. Under this standard, a court will not second guess the decisions of a director as long as they are made (1) in good faith, (2) with the care that a reasonably prudent person would use, and (3) with the reasonable belief that they are acting in the best interests of the corporation.”); see also *Sinclair Oil Corp. v. Levien*, 280 A.2d 717 (Del. 1971) (discussing the inappropriateness of applying the business judgment rule where there is evident self-dealing).

40. *Lake Mich. Fed’n*, 742 F. Supp. at 449.

41. *Id.* at 445.

42. For example, see *State v. McIlroy*, 595 S.W.2d 659 (Ark. 1980), which notes the parallel federal use of the term.

Tenures Abolition Act of 1660.⁴³ Unfortunately, the rise of the navigation servitude in federal constitutional law shows how the public trust doctrine can be both used and abused. As to the former, it is clearly within the province of the government to make sure that private parties, whether riparians or others, do not damage the common waters of the United States. It was for that reason that the Rivers and Harbors Appropriation Act of 1899, still on the books, requires a permit for dumping and dredging in public waters.⁴⁴ It is the kind of management that one can respect. Indeed, there are many cases from the nineteenth century that ask the question of whether riparians are permitted to protest against changes that take place within the river, where the rough answer is that so long as the river remains within its banks, all is well, but if it starts to flood uplands then the action can be enjoined, unless compensation is provided.⁴⁵ The basic test to determine the abuse of the public trust doctrine in all these cases is this: Does the action of the government amount to conduct that, if done by a private party, would amount to a compensable wrong? If so, then it should be enjoined unless the state is prepared to pay just compensation for its loss. If not, then the private party may suffer economic dislocation but from no cognizable harm, as per the distinction introduced at the beginning of this paper.

The modern cases on the navigation servitude pay scant attention to this distinction. The basic approach is that the federal government has

43. Tenures Abolition Act 1660 12 Car. 2 c. 24 (Eng.). It should be noted that the statute was passed in the twelfth year of the reign of Charles II, shortly after his restoration to the Throne. The reckoning was from the execution of Charles I. It was as if the Commonwealth under Oliver Cromwell had never existed.

44. 33 U.S.C. § 403 (2012).

The creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is prohibited; and it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States, outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of the Army; and it shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor or refuge, or inclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army prior to beginning the same.

Id.

45. See, e.g., *Canal Appraisers of N.Y. v. People ex rel. Tibbits*, 17 Wend. 571 (N.Y. 1836) (raising water within natural banks, no taking of riparian rights, by a thirteen to eleven vote, with Chancellor Kent writing the dissent); *Pumpelly v. Green Bay Co.*, 80 U.S. 166 (1871) (permanent flooding, a taking). I address some of these cases in Richard A. Epstein, *Rediscovering the Classical Liberal Constitution: A Reply to Professor Hovenkamp*, 101 IOWA L. REV. 55, 83–90 (2015).

jurisdiction over navigation on interstate rivers under the Commerce Clause, a proposition that was settled as early as 1824 in *Gibbons v. Ogden*.⁴⁶ But the jurisdiction to regulate is not the same thing as ownership of all that is regulated. The proper arrangement, which was notably urged by Justice Mahlon Pitney, one of the true stalwarts of limited government on the Supreme Court, was that the action could go forward only if compensation was paid.⁴⁷ But the forces of the Progressive Era took the opposite position, so that once the government decided it wanted to control the operations on the river, it could do so without regard to the private losses that it created, all of which were treated as non-cognizable.⁴⁸ The net effect is that the entire system of correlative rights that dominated water law was displaced by an absolutist navigation easement that ignored all the relevant trade-offs. It is as though a system of limited and divided governance was replaced by an autocratic monarch, based on the fundamental confusion between federal power, which gives the government the right to make the laws, and outright confiscation, which allows them to do so in disregard of private rights.

The second problem asks just what property is subject to the public trust doctrine. A classic illustration of how not to understand it is in *Matthews v. Bay Head Improvement Association of New Jersey*.⁴⁹ The court started by noting that in New Jersey, the public trust doctrine extends not only to the channel, but up to the “dry sand beach immediately landward of the high water mark,”⁵⁰ which is perhaps more than is necessary to allow access up and down the beach. Nonetheless, in *Matthews* the court extended the scope of the public trust one step further by applying it to seven extensions of streets perpendicular to the beach. It seems clear that if access can be denied to the beach, much of the benefit of free movement along the beach is necessarily lost, so there is good reason to allow for the creation of passageways of this sort.

Now, what is the difference, and why is that decision wrong? Keeping the river open essentially is a situation where you are trying to overcome the serial blockade by adjacent landowners, for the same

46. *Gibbons v. Ogden*, 22 U.S. 1 (1824).

47. *United States v. Cress*, 243 U.S. 316 (1917).

48. For key cases, see *Scranton v. Wheeler*, 179 U.S. 141 (1900); *United States v. Chandler-Dunbar Water Power Co.*, 229 U.S. 53 (1913); *United States v. Willow River Power Co.*, 324 U.S. 499 (1945); *United States v. Twin City Power Co.*, 350 U.S. 222 (1956); *United States v. R. B. Rands*, 389 U.S. 121 (1967). For a more exhaustive treatment of these issues, see Richard A. Epstein, *Playing by Different Rules? Property Rights in Land and Water*, in *PROPERTY IN LAND AND OTHER RESOURCES* 317 (Daniel H. Cole & Elinor Ostrom eds., 2012).

49. *Matthews v. Bay Head Improvement Ass'n*, 471 A.2d 355 (N.J. 1984).

50. *Id.* at 358.

reason that the water is kept in the commons in the original position. But there is no parallel blockade risk with respect to perpendicular access, which could take place at a large number of locations. At this point, the real question you have to ask is this: How many access points to a seashore do you really need? If the state can claim them all at zero price, it will claim every last one of them. But there is a way to ration its activities, which is to require it to condemn or purchase, and compensate for, the access rights to the beach, without declaring it public trust property by a judicial *ipse dixit*. The imposition of the compensation thus puts pressure on the state to reduce the number of access points to the efficient level, so it will no longer engage in excessive condemnation. There is also, given the takings power in this setting, no real holdout issue. Since we do not know in fact which of these adjunct places is the one that belongs to the river and which one does not, we cannot invoke the public trust doctrine, even though it is perfectly sensible for keeping the flow of rivers and lakes open. At that point the only question left is whether the township can charge outsiders for access more than they charge the insiders, who have of course funded the condemnation with their tax dollars.

B. *Conversions of Legal Regimes*

I have said enough to explain how complicated it is to set out a set of correlative rights and duties in waters. But the issue becomes even more vexing when the initial set of rights created leads to inferior social results. Owing to the many interests involved, it is not possible to envision voluntary transactions that will solve this basic problem. The need for government coercion is evident, and the question is how it should be exercised. That issue came to a head in Colorado, where the riparian system, which favors in-stream uses over consumptive uses, basically speaking, is a loser. The explanation that I like to give for that mismatch is: “Oh, riparian landowner, bring your cows to the edge of the Grand Canyon to drink the river’s water.” It is not going to work.

The issue arose in vivid form in the famous 1882 case of *Coffin v. Left Hand Ditch Co.*,⁵¹ in which the Supreme Court of Colorado shattered the old riparian system in order to legitimate the prior appropriation system.⁵² Its move is tricky because both federal and state constitutions protect private property, which surely means that these rights cannot be wiped out with the stroke of a pen. But not if, as the Court claimed in *Coffin*, there was an “imperative necessity” to switch

51. *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443 (1882). See also Epstein, *supra* note 2, at 403.

52. *Coffin*, 6 Colo. at 447.

from one system to another, and to do so without the payment of just compensation.⁵³ The reason for the imperative necessity was that the original common-law riparian system prevented water from being diverted to land that was not adjacent to the river, where it would be used far more productively.⁵⁴ Freezing the riparian system into place would only have guaranteed the massive waste of water, and thus it had to be replaced. The reason for denying just compensation was that there were too many moving parts to allow anyone at a reasonable cost to determine how much compensation should go to thousands of individuals. Given these formidable difficulties, the court made the decision to obtain the allocative gains without worrying about the distributional consequences, trusting in part that the losers under the system would get at least some compensation from the overall increases in productivity. *Coffin* was handed down at a time when the consumptive uses dominated the prior appropriation system, as it did for a long time.⁵⁵ Today, there is much pressure to move to a system that recognizes and protects in-stream uses even in a prior appropriation state.⁵⁶ That switch may well lead to a modification of the prior appropriation doctrine, but it could never justify a return to English riparianism, so ill-suited for Colorado rivers.

Indeed, there are vast difficulties with the appropriation system as it is now configured, so much remains to be done. To put the point in a somewhat different way, the only point that *Coffin* established was that the prior appropriation system was superior to the riparian system that it replaced along the Colorado River. What the case did *not* establish was that the prior appropriation system then devised was the best of all possible systems that could be created. The question is what improvements can be made from the new baseline that *Coffin* established. To see why there is ample room for growth, assume that an ideal system of water allocation rates at 100. The shift from riparianism to prior appropriation may move the needle from 5 to 20, which is a four-fold improvement, but one which leaves a large amount of room for further improvement.

In general, the important paths will be two: improved measurement techniques and a response to changed technologies. With regard to the first, it should be clear that a system that determines entitlements solely based on the amount of water drawn out at a particular point from the river must of necessity pay little or no attention to the way in which that

53. *Id.* at 446, 449.

54. *Id.* at 447.

55. For that defense, see Frank J. Trelease, *Government Ownership and Trusteeship of Water*, 45 CAL. L. REV. 638 (1957).

56. See generally Eric T. Freyfogle, *Water Rights and the Common Wealth*, 26 ENVTL. L. 27 (1996).

water is used once it is removed. At this point wastage within ditches for example does not register as a social loss. By the same token, any effort on the part of a particular rights holder to fix the ditch could have uncertain external consequences. The improved technology could in some cases increase the levels of return flow, but the prior appropriator has insufficient incentives to make the change, given that some fraction of the benefit will be obtained by others.

In a similar fashion, the switch from furrow to drip irrigation increases the rate of absorption and reduces the return flow, which prejudices downstream users. Yet by the same token, the appropriators are reluctant to lower the amounts taken out, lest they be forfeited back to the system.⁵⁷ On balance, it seems that the high levels of cultivation of existing areas will have smaller yields than allowing the water to move to areas that are less intensely cultivated, but there is no way in which this transfer can be made within the current system of rights. What makes these changes so difficult to deal with is that current measurement techniques make it difficult to determine whether these changes (which can never be a Pareto improvement) count as a Kaldor-Hicks improvement.⁵⁸ Finding ways to measure the entitlement by net consumption at a given point might go a long way to ease some of these questions.

As is often the case with water law, the principles that apply to disputes between individuals often apply to those between sovereigns: After all, the movement of water over long distances will necessarily give rise to disputes between two sovereigns, whether one works under the riparian or prior appropriation system. Thus in *Nebraska v. Iowa*,⁵⁹ the Supreme Court invoked the standard Roman law principles of alluvion and avulsion to determine the boundary between Iowa and Nebraska: the small shifts along the muddy Missouri after both states joined the union were part of the ebb and flow, but the single avulsion along the river did not change the overall boundary.

The same issues arise within a prior appropriation system. One recent illustration of the problem is the long-going lawsuit *Montana v.*

57. Vanessa Casado Pérez, *Crying Over Spilled Water: Rethinking Prior Appropriation Rights and the Meaning of Agricultural Efficiency* 22 (Oct. 12, 2015) (unpublished manuscript), <http://ssrn.com/abstract=2633146>.

58. *Pareto Improvements and Kaldor-Hicks Efficiency Criterion*, RECKON LLP, http://www.reckon.co.uk/open/Pareto_improvements_and_Kaldor-Hicks_efficiency_criterion (last updated Dec. 14, 2010) (“[A] Kaldor-Hicks improvement is defined as a change that is either a Pareto improvement or such that: the ‘winners’ from the change would be able to compensate the ‘losers’ and still be better off (Kaldor criterion); and the ‘losers’ could not afford to bribe the ‘winners’ to prevent the change (Hicks criterion).”).

59. *Nebraska v. Iowa*, 143 U.S. 359 (1892).

Wyoming,⁶⁰ which presents the issue in stark form. As is often the case, Wyoming and Montana entered into a treaty which allocated the amount of water to be used by the two states by the laws of prior appropriation.⁶¹ The dispute arose when Wyoming landowners adopted a more efficient system of irrigation on the same lands as before, which reduced the amount of the return flow to Montana. The Supreme Court held that so long as the water was used on the same acreage specified in the original treaty, Montana could not complain that the amount of water that it had received had been reduced.⁶²

The opinion by Justice Clarence Thomas followed the model of prior appropriation law to a T, which is a source of systematic uneasiness. The danger here is that unilateral technical changes by one party that work for its own benefit cannot be prevented by the other side, which is rendered worse off. Where these changes are small, they are probably not worth worrying about, but once they become larger, it is questionable whether larger changes should be met with the same level of indifference. It is of course possible to renegotiate any treaty, but the obstacles to that task are indeed formidable, especially since any renegotiation requires that the individual rights holders in each state be brought into the process. There is a further question of whether something like a federal eminent domain procedure can be put into place, but here again, figuring out which rights holders receive which levels of compensation is no easy task. At this point, it could be asked whether the judicial boldness of *Coffin* could be brought to bear, for which I think that the answer is a decided no. The overall gains to the system from shifting rights is unclear, and the size of the individual losses is really high, unlike any uncertain riparian rights along Colorado rivers. The strength of the *Coffin* decision lies in the fact that we know that the aggregate gains are huge and the private losses are negligible.⁶³ Clearly much remains to be done in this area.

It does not follow, however, that there are no reforms that can be made without tackling the matter of vested rights. One possible modification of the system is to relax the view that all appropriation

60. *Montana v. Wyoming*, 563 U.S. 368 (2011).

61. The key provision of the Yellowstone River Compact is Article V(A), which provides: "Appropriative rights to the beneficial uses of the water of the Yellowstone River System existing in each signatory State as of January 1, 1950, shall continue to be enjoyed in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation." Yellowstone River Compact Act of October 30, 1951, Ch. 629, 65 Stat. 663 (1951), <https://www.gpo.gov/fdsys/granule/STATUTE-65/STATUTE-65-Pg663/content-detail.html>.

62. *Montana v. Wyoming*, 563 U.S. at 379–82.

63. For further discussion, see Richard A. Epstein, *From Natural Law to Social Welfare: Theoretical Principles and Practical Applications*, 100 IOWA L. REV. 1743, 1767–72 (2015).

rights must be consumptive. It should be perfectly possible for people to purchase rights to water that they then for various ecological or environmental reasons leave inside the river in order to support various aquatic forms of life or recreational activity.⁶⁴ If anything, leaving some water in the river will have the effect of promoting the consumption rights of some persons downstream from the decision to leave water in the river. Once that approach is taken, people like Craig Mackey⁶⁵ can work their agenda to maintain the Colorado River's volume without having to secure major legal reforms in the prior appropriation system. The approach here is exactly what nature conservancies do when they acquire land, and there is no reason why that same strategy cannot be adopted with respect to water. Nor is this an enterprise that only private parties can undertake, although it is one that they should engage in. The state can also make budget commitments to water rights acquisition, with the idea of buying, preferably in the voluntary market, water rights that are worth more to the state than they are to the seller.

The key advantage of this program is that it avoids the destructive public choice dynamic in which the only way one side wins is for the other side to lose. Those conflict games benefit no one in the long run, which is one reason why just compensation should be usually required when property rights of value are taken. It takes the sting out of the resistance. If you throw in the correct level of compensation for the rights bearer, resistance should melt away because now you increase the possibility of achieving a Pareto improvement where both sides are left better off than they were before. So it is absolutely critical in these particular cases to think about the definition of a property right not only in terms of the historical origins, but in ways that start to facilitate exchanges.

One last cautionary point here is that coerced exchanges are not the only source of risk. Subsidies for various groups are always risky, even for small players. Water law should not fall prey to the infant industry fallacy whereby marginal firms are given an extra lease on life, one which can go on for far too long. There is in this regard nothing special about water rights. The purchases that are allowed for farmers in Central California Valley are no better than the special subsidies that are given to ethanol or wind or solar energy. All subsidies distort in the short run, and for the most part those losses are only compounded in the long run. The argument here is just another application of the fundamental rule of the public trust doctrine: The state does as much harm when it gives away

64. See, e.g. COLO. REV. STAT. § 37-92-102(3) (2008).

65. Craig Mackey was a panelist at this conference, *supra* note 1, and is Co-Director of Protect the Flows, a coalition of businesses that protect and support the Colorado River.

resources for below market value as it does when it takes them for below market value. Sales are fine, but only with just compensation.⁶⁶ And once that full price is demanded, we will see the same behavior in water markets as everywhere else. People will economize so that the demand for scarce resources declines, which is the socially desirable result.

II. THE COMMONS IN INTELLECTUAL PROPERTY LAW

It is quite clear that the lion's share of this paper has been devoted to the operation of the water system, where the interaction between private rights and the commons gives rise to many complexities. But of course the intellectual commons is also a central part of any system of intellectual property. The creation of patents, copyrights, trademarks, and trade secrets differs in many particulars, but all of them start with the assumption that there is a core set of notions that lie outside any and all systems of private intellectual property rights. These core elements are ones that all individuals are entitled by right to use as much as they want. The use of the English language is, of course, part of the general commons, even if certain trade names are not. The "Monopoly" trade name does not block economists from talking about monopoly power.

Let me therefore begin with a story from thirty years ago that helped me to understand the power of the intellectual commons. The incident was an exchange with my daughter, then aged five. We were riding home from the University of Chicago Laboratory School, and we started to spell names. As we crossed 55th Street, my wife and I came to my daughter's name: Melissa. We said "M-E," and when the "E" came out, Melissa burst into tears. We said, "Melissa, why are you so upset about the E?" She looked through the tears and cried out, "I need to save the E to spell Rachel's name!" Rachel was at that time her best friend. Now what was my daughter thinking? This is actually a very serious point. She had these magnetic letters, which you put on the refrigerator. Those letters, it turns out, are a scarce quantity. If you take the "E" and you put it in "Melissa," it is no longer available to put in Rachel's name. That single E can be used only once. So armed with this powerful visual image, Melissa was fully justified to protest that the "E" was now being allocated to the wrong person. But what is nice about language, as I tried to explain to her, was this: "My dear daughter, you know that when it comes to ordinary language, letters are platonic forms of which you have an infinite supply at zero price. There is no scarcity constraint operative in this domain." And she looked at me, somewhat puzzled. The tears did

66. Cf. Epstein, *supra* note 2, at 417 ("[T]he price mechanism forces an honest revelation of preferences.").

not stop. But the insight still stands. Scarcity is *not* a universal constraint. For some forms of intellectual property there is indeed an inexhaustible supply, necessarily at a zero price. Unless we criminalize the use of the letter E, there is now a powerful verbal commons that no one creates and from which everyone benefits.

From this one example, it follows that this commons has to be protected against encroachment by private ownership. And it is easy to see why what holds with letters also holds with numbers, and what holds with English sentences holds for mathematical sentences, so that no one could ever gain a right to exclude others from the use of the formula that the area of a rectangle is length times width. It is instructive, too, that no one has ever tried to extend intellectual property to ordinary language and basic mathematics. It takes little imagination that no one should get a patent on the method of spelling Melissa with an “E” or Newton’s laws of motion. The arguments about the intellectual commons track that for watercourses. The blockade costs are very high, but the privatization will do little to promote discovery in this area. If you want to encourage proof of Fermat’s last theorem, by all means let some private party award a prize for the proof, which of course could never be achieved if everyone had to pay a royalty for applying the Pythagorean Theorem.

The question then arises: What falls into this intellectual property commons? The customary answer is: scientific laws, mathematical theorems, and natural compounds of elements. You cannot patent polonium, gold, or silver. They are out there in some natural form and you have not added the inventive step.⁶⁷ So the great challenge in this particular system is how to build the private system of property rights that works with natural elements. One form of property rights that was not mentioned at all in the Silicon Flatirons conference was trade secrets. The question is: Why not? Well, let us suppose that there is something that is already held in common and you decide to treat it as a trade secret. Since everybody knows it anyhow before you do it, your supposed trade secret has zero value. So trade secrets essentially develop a kind of natural rhythm of their own. The only information that can be subjected to a trade secret is information whose value to you depends in part on

67. European Patent Convention art. 56, Oct. 5, 1973, 13 I.L.M. 286 (stating the U.S. equivalent of *nonobvious*: “An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art.”).

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.

35 U.S.C. § 103 (2012).

keeping it secret from others. So the law develops fairly comprehensive definitions of trade secrets,⁶⁸ and it then allows these things to be traded under promises of confidentiality, understanding always that if somebody else develops that same trade secret independently, no one can stop that person from using it. Indeed, in many cases more than one person has the same trade secret, perhaps unbeknownst to others, and all are entitled to keep them that way.

In dealing with trade secrets, the law allows first privatization and then free entry. It turns out the full operation of the system can become quite complicated because somebody who steals a trade secret, or obtains it by inadvertence, will typically not disclose the trade secret to the public. After all, that disclosure creates a public good of what would otherwise be a duopoly. Since many trade secrets cover industrial processes, parallel invention works quite well, as notions of theft can be carried over into this area. To be sure, there are major difficulties in connection with whether to allow the reverse engineering of trade secrets. The complications that arose eventually led to the adoption of the Digital Millennium Copyright Act.⁶⁹

My view is: That is a hard question. I am not here to talk about hard questions. I am here to talk about easy questions. Now why do I want to talk about easy questions? Because, if these questions receive the wrong answer, it is fatal. On the other hand, if there are close, difficult questions that are not answered quite right, the difference between the first and second best alternatives is likely to be far smaller, so that the overall system can survive those mistakes. So here are some very general comments about the different forms of intellectual property that surround the basic commons.⁷⁰

The first area is the trademark. The first salient point is that a

68. See UNIF. TRADE SECRETS ACT § 1(4) (NAT'L CONFERENCE OF COMM'RS ON UNIF. STATE LAWS 1985), which covers:

[I]nformation, including a formula, pattern, compilation, program, device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to or readily ascertainable through appropriate means by other persons who might obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

The earlier common law definition is found in RESTATEMENT (FIRST) OF TORTS § 757 (AM. LAW INST. 1939). The Uniform Trade Secrets Act has been enacted by forty states and the District of Columbia.

69. Digital Millennium Copyright Act, Pub. L. No. 105-304, 112 Stat. 960 (1998) (codified as amended in scattered sections of 17 U.S.C.) (guarding against reverse engineering to unlock copyrighted works).

70. See Richard A. Epstein, *Intellectual Property: Old Boundaries and New Frontiers*, 76 IND. L.J. 803 (2001) (expounding these issues).

trademark always has an infinite duration.⁷¹ The basic point here is that if you put a trademark into the commons against the will of its owner, it becomes worthless because the trademark is designed to offer an implicit warranty of the quality of the goods produced under the brand, which is self-executing in the sense that no one need sue to inflict sanctions on a firm whose branded product turns out to be dangerous or ineffective. The reputational loss attributable to widespread customer defection is magnified by the brand. Yet if any seller can use anyone else's brand, the bonding device breaks down, for it does not make sense for customers to abandon a reputable firm for the derelictions of another that has used the same brand. So the major question about the trademark is whether or not its "secondary" meaning has become part of the English language so that words like "Xerox" are always running the risk of falling into the public domain, until the generic term "copier" makes it easier to protect the mark. It also turns out that "Cola" goes into the public domain but "Coca-" does not. So you get "Coca-Cola" and "Pepsi-Cola," but you do not get "Coca-Cola 2."

The question is: Do we eventually cover the world too much with privatization? My answer is: I am less pessimistic than some people here because I think language is always generating new terminology. If you look at the Internet age and so forth, we have a whole set of terms that I never quite understand in dealing with social media, so that the language is in general refreshed by new terms just as old terms go out of style.

Copyright, of course, presents problems of its own. There is no way that one can copyright terms in ordinary use in the English language, and in general, the originality requirement is one effort to mark off the private from the public space. That requirement does enormous good in many cases, but it turns out not to work so well with databases. Thus the important Supreme Court decision in *Feist Publications, Inc. v. Rural Telephone Service Co.*⁷² holds that there is nothing original in the "selection, coordination, and arrangements" of the white pages that Feist copied from Rural, and hence denies it copyright protection.⁷³ The decision is right in its result but wrong in its argumentation. There are two problems here that require some notice. The first is that Feist did not have to compensate Rural for the great deal of labor it took to put together the data set. Second, Feist's appropriation will thus unravel all the other licenses that other compilers had arranged with Rural, given that Rural got that information because it was the sole provider of

71. See 15 U.S.C. §§ 1058–1059 (2012); see also *Trademark FAQs*, U.S. PATENT & TRADEMARK OFFICE (Aug. 5, 2014, 9:17 AM), <http://www.uspto.gov/learning-and-resources/trademark-faqs>.

72. *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340 (1991).

73. *Id.* at 359.

telephone service within the region.

The combination of these two facts is suggestive of the proper solution. The first point is that it is always dangerous to allow one person to profit off the labor of another, and the second point is that the monopoly position that Rural had with respect to its information requires some institutional response against supracompetitive profits. Regarding the first, the most suggestive precedent is *International News Service v. Associated Press*,⁷⁴ which Justice O'Connor cites in *Feist* for the proposition that copyright protection under the 1909 Act only attaches to original works.⁷⁵ Otherwise, Justice O'Connor thought that the earlier decision was irrelevant, but in fact its logic dictates the opposite conclusion from that she reached in *Feist*. At issue in *INS* was whether the INS reporters who copied information off the bulletin boards that its competitor AP had prepared exclusively for its own members' use had committed a tort when they reworked that material (so that it did not involve copying the original bulletin verbatim) and which they then sent by telegraph to the West Coast for use by INS members. In dealing with this case, the dissents of Justices Holmes and Brandeis each noted that the best that AP could hope for was some notification to the effect that the information in question had been collected from the AP boards so that all persons would know who the source was.⁷⁶ This argument followed the standard libertarian premise that the limit of protection between traders involves the use of force and fraud.

It is quickly apparent that the disclosure remedy is of no help to AP. The subscribers of INS may well be even *more* willing to use that information for their stories knowing that it comes from AP and not some fly-by-night source. Justice Pitney (himself a master of equity) understood that point and invented as a common law matter a tort of misappropriation that allowed AP to enjoin the use of that information by its direct competitor, INS, for the period of a single news cycle—here, one day.⁷⁷ But that formulation meant first that the information contained in the bulletins could be used immediately by anyone who read it from their papers. It also meant that anyone else, AP included, was free to use information about the underlying events that they collected themselves. The point here was to prevent the theft of labor without creating an undue monopoly power.

Justice O'Connor explicitly stated that *INS* had no application to

74. *Int'l News Serv. v. Associated Press (INS v. AP)*, 248 U.S. 215 (1918).

75. *Feist*, 499 U.S. at 354.

76. *INS v. AP*, 248 U.S. at 246–48.

77. *Id.* at 232 (stating the actual injunction prevented copying “until its commercial value as news had passed away,” which in practice is one day).

Feist.⁷⁸ But that was a mistake. The correct response was to recognize that the misappropriation of labor was as much an issue in *Feist* as it was in *INS*, so that it was pointless to wait for regulations to introduce protection into this area. At this point, the want of originality only means that the protection will not be found under the Copyright Act, but under the common law. But the entire picture also requires that some weight be given to the monopoly position of Rural. The simplest way to do that is to note that, as a monopolist, it is under the general duty to issue licenses to this material to all comers at a fair, reasonable, and non-discriminatory rate.⁷⁹ At this point, the combination of two related areas of law create a coherent approach. But once *Feist* became law, lower courts were forced into the pointless exercise of asking whether sufficient originality inhered in various data sets met the *Feist* test.⁸⁰ If not, then they could use it for free.

Within the domain of copyright, there are of course exceptions of which the most notable is for fair use,⁸¹ which has no patent parallel. There is a very good reason for that. The first point is that under the copyright law, fair criticism is always protected by fair use. One could not criticize a doctrine, or an article, or a literary work without quoting short passages from it. So if the publication is not an effort to scoop the original publication, as *The Nation* did when it published large portions

78. *Feist*, 499 U.S. at 353–354.

79. See, e.g., *Maislin Indus. v. Primary Steel*, 497 U.S. 116 (1990) (discussing rates); *Interstate Commerce Act*, 49 U.S.C. § 10741 (2012) (non-discriminatory) and § 10701 (2012) (reasonable).

80. See, e.g., *BellSouth Advert. & Publ'g Corp. v. Donnelley Info. Publ'g*, 999 F.2d 1436 (11th Cir. 1993) (holding yellow pages unprotectable); *Key Publ'ns v. Chinatown Today Publ'g Enters.*, 945 F.2d 509, 516 (2d Cir. 1991) (concluding the database is of interest to Chinese-Americans).

81. 17 U.S.C. § 107 (2012)

Notwithstanding the provisions of sections 106 and 106A, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include—

- (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- (2) the nature of the copyrighted work;
- (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
- (4) the effect of the use upon the potential market for or value of the copyrighted work.

The fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all the above factors.

Id.

of Gerald Ford's autobiography,⁸² it is fine to quote some passages of deathless prose to show how good or bad the author is. The work is fair game even if the author cannot thereby be subject to gratuitous abuse.⁸³

There is a good reason why in the core cases of review the critic should never seek out the person whose work he wants to review, be it author or chef. The risk here is that the only critics who will gain access to the protected work are those who expressly or impliedly promise to shade their account in favor of their subject. That result will degrade the information generally, creating a real public loss. And it will also make it difficult for excellent authors or chefs to credibly obtain the strong reviews that they deserve. Bypassing contractual arrangements thus improves the collection and transmission of information for all concerned.

There is yet another reason to favor fair use in a number of contexts. It is a way to overcome blockades by individual copyright holders. Thus a simple picture may contain a Coke can in the background. Does Coke have to give consent for the picture to be woven into a documentary? My own view is clearly not. I think that the best analogy to this case comes from the law of privacy, where it is widely understood that individuals who appear in news pictures at public events have no claim for invasion of privacy.⁸⁴ The point could prove important. Thus suppose that someone would like to make a documentary which shows the history of the telephone, which could only be done by using short clips from a multitude of films, each of which contains multiple copyright materials. The sums in question are small, but the number of consents needed is large, so that it is on balance better to displace the requirement of consent with a "live-and-let-live rule" similar to that which is used for low-level, reciprocal nuisances.⁸⁵ The level of reciprocity is far from perfect, but the overall gains are large. Unlike the situation in *INS*, it is perfectly clear that this class of uses is not competitive with any use of the copyrighted material that could be made by its owner. And, generally speaking, if somebody mentions your work in a documentary, by-and-large it is going to be favorable, so you receive some just compensation in exchange anyhow.

So the best solution is essentially a series of bright-line rules, which places a clear limit on the amount of time for any given exposure. Normally, time is scarce, so that it is unlikely that documentary filmmakers will want to dwell unduly on some given image. There are of

82. See *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539 (1985).

83. *Triggs v. Sun Printing & Publ'g Ass'n*, 71 N.E. 739 (N.Y. 1904).

84. See, e.g., *Tropeano v. Atl. Monthly Co.*, 400 N.E.2d 847 (Mass. 1980) (stating the inclusion of a picture in a story is not appropriation for advertising purposes).

85. See *Bamford v. Turnley*, [1860] 122 Eng. Rep. 25, 32–33.

course exceptions to every rule, of which the most conspicuous is found in *Zacchini v. Scripps-Howard Broadcasting Co.*,⁸⁶ where someone recorded, for only fifteen seconds, a performer jumping out of a cannon.⁸⁷ If the performance is shown once, its value in commerce is gone, which is a far cry from the usual clip that serves as a teaser for the entire picture. The general case, rather than the exceptional case like *Zacchini*, should dominate the rule. Therefore, short-term permission is needed to overcome potentially serious holdout problems. This also avoids the impossible task of organizing a compensation system in which the amount needed to run the transfers could exceed the amount transferred, especially since there is no obvious uniform market value for all the relevant clips and excerpts in question. The aggregate gains justify in this instance any deviation from ideal measurement, especially since the rule does not target selectively any particular copyrighted work. The case here is a far cry from the ASCAP/BMI situation where entire songs are played multiple times.⁸⁸ In that setting, getting the compensation right through some centralized agency that can monitor performances in various venues is now warranted, as the cost of its administration is a relatively small fraction of the total payments that must be made. Yet in these instances, finding the correct compensation levels is critical for the long-term stability of the arrangement.

At this point, I turn quickly to patents, where the question of what belongs in the common pool has long been a subject of contention. One of the worst cases in this area is *Funk Brothers Seed Co. v. Kalo Inoculant Co.*,⁸⁹ decided in 1948, written by Justice William O. Douglas, who was strongly anti-patent. There, a scientist named Bond found a way to place certain root-nodule bacteria in a single inoculant that could be used to work on several different kinds of bacteria simultaneously. Prior to his discovery, a separate inoculant had to be prepared for the dealing with the separate bacteria in clover, alfalfa and soy beans, which was a long and laborious process. Justice Douglas held that this advance was not subject to patent protection at all because it only involved the assembly of natural products and thus should be treated as a non-patentable law of nature.⁹⁰ Why this ad hoc information should rise to the dignity of a “law of nature,” when it bears no resemblance to Newton’s law of universal gravitation, is left unexplained. The solution that Bond hit upon could not be logically deduced. It could only be verified by

86. *Zacchini v. Scripps-Howard Broad. Co.*, 433 U.S. 562 (1977).

87. *Id.* at 563.

88. *Broad. Music, Inc. v. Columbia Broad. Sys., Inc.*, 441 U.S. 1, 1 (1979) (noting the antitrust issues, which in this instance are mitigated by the strong opt-out positions).

89. *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948).

90. *Id.* at 130–32.

extensive trial and error work, for which patent protection is fully warranted. The creation of patent protection should not be limited to matters of inspiration. Those of perspiration apply as well, whether your name is Bond or Edison.

The decision in *Funk Brothers* helped spur the adoption of the 1952 Patent Act,⁹¹ the remarkable document by Pasquale Joseph Federico and Giles Rich that contained a broader definition of patent eligible works. They hit on the basic structure by taking broad classes of patentable subject matter, subject to an individualized test, which asked whether or not the advance in question would have been evident to a person having ordinary skill in the art. One of the real fruits of this decision was the expansion in patent eligibility in *Diamond v. Chakrabarty*,⁹² which made genetically engineered microorganisms patent eligible, leading to the DNA revolution, or at least the protection of the processes and products.

In recent years, the Supreme Court has tended to take a narrower view of patent coverage, which rehabilitates cases like *Funk Brothers*. In general, I think it is a mistake to deny protection anytime it costs an inventor a small fortune to put some new project together, when it costs someone else virtually nothing to imitate it. Unfortunately, the recent decision *Alice v. CLS Bank* held that the detailed specifications for how a program interacted with machinery was patent ineligible, which leads to the question of whether any such instructional software device can ever fall within a patent eligible class.⁹³ So long as the program and equipment inputs real data and churns out some instruction, it looks as though the device should be patent eligible, even if it must then survive a non-obviousness test, which was the position of Giles Rich in his decision *in re Alappat*.⁹⁴ Typically, these patents do not act as blockades, given the success of standards organizations in coordinating separate patents into workable portfolios, both for use by their members and others.⁹⁵ Indeed, there is a serious danger that inventions that are left in

91. Patent Act, ch. 950, 66 Stat. 792 (1952) (codified as amended at 35 U.S.C. §§ 1–390 (2012)).

92. *Diamond v. Chakrabarty*, 447 U.S. 303, 303–04 (1980).

93. See *Alice Corp. Pty. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2357 (2014).

94. *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (upholding an oscilloscope patent, noting: "Although many, or arguably even all, of the means elements recited in claim 15 represent circuitry elements that perform mathematical calculations, which is essentially true of all digital electrical circuits, the claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine for converting discrete waveform data samples into anti-aliased pixel illumination intensity data to be displayed on a display means. This is not a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result." (footnotes omitted)), *abrogated by in re Bilski*, 545 F.3d 943, 959 (2008).

95. Richard A. Epstein, F. Scott Kieff & Daniel F. Spulber, *The FTC, IP and SSOS: Government Hold-Up Replacing Private Coordination*, 8 J. COMPETITION L. & ECON. 1, 17–

the public domain will be commercialized by no one, which is why the Bayh-Dole Act of 1980 encouraged first universities and then individual inventors to patent inventions developed with the support of federal funds, lest they languish unused in the public domain.⁹⁶ The judgment behind Bayh-Dole has to be that the greater security of knowing that some device is patent protected can result in more development than for a device that anyone else could in secret work to commercialize. The public domain has an important role to play in patents. But it hardly follows that its relentless expansion is required for overall social innovation. It is dangerous to be dogmatic about its primacy.

III. THE SPECTRUM WITHOUT A COMMONS

The spectrum presents an interesting historical challenge because the resource cannot exist until the technology is created.⁹⁷ In dealing with the allocation of spectrum, the first question is whether it ought in some sense to be in a commons. But in this instance, the value of the spectrum depends largely on its use as a mode of communication. The key requirement is to make sure that all the usable spectrum is allocated in such a way that all persons who desire access can obtain it. That is best achieved in two ways. First, with broadcast, the problem takes care of itself, given that the publication of the information is open to all who have a receiver. Second, with respect to telecommunications between discrete persons, the correct response is to regulate those in charge of transmission as common carriers to assure that all have access, at least in those cases where there is a single provider. Once these two measures are taken, it is doubtful that there is a need for any commons, subject perhaps to the common exception for low frequency, short-distance operations like TV remotes, garage openers, and wireless car keys which can operate side-by-side with more powerful signals with broader range.

In principle this simple pattern should be easy to obtain, but historically that did not prove to be the case. The original allocation of the spectrum in the United States took place shortly after the Titanic sunk in April 1912. The Communications Act of August 1912⁹⁸ contained a general licensing scheme that allocated huge chunks of the spectrum to the most insistent short-term user,⁹⁹ the United States Navy, for ship-to-

18 (2012).

96. Bayh-Dole Act, Pub. L. No. 96-517, 94 Stat. 3015 (1980) (codified as amended at 35 U.S.C. §§ 200–12 (2012)).

97. See generally Ronald H. Coase, *The Federal Communications Commission*, 2 J.L. & ECON. 1 (1959); see also Thomas W. Hazlett, *The Rationality of U.S. Regulation of the Broadcast Spectrum*, 33 J.L. & ECON. 133, 135 (1990).

98. Communications Act of 1912, Pub. L. No. 264, 37 Stat. 302 (1912) (repealed 1927).

99. *Id.* §§ 1–3.

shore technology.¹⁰⁰ One of the unfortunate decisions of the 1912 Act is that it not only designated exclusive rights, but also that it designated the purposes for which those particular rights should be used. That system was more comprehensively developed under the Radio Act of 1927.¹⁰¹ It is as though the government created a system of land titles that had the effect of dividing up New York City, where the government allowed someone to own a plot of land on 5th Avenue and 42nd Street, subject to the constraint that he could only use it for a single family home, unless some zoning board approved some particular change. Indeed, this comparison is more apt than might appear at first blush. Herbert Hoover as Secretary of Commerce was most active in securing the passage of the 1927 Act. The year before, he convened a well-known meeting of state authorities from which emerged A Standard State Zoning Enabling Act (“SZE A”),¹⁰² which set the template for state zoning laws. That same year the Supreme Court gave zoning its constitutional blessing in *Euclid v. Ambler Realty Co.*¹⁰³ By 1930, the SZE A had served as the template for thirty-five state zoning statutes.¹⁰⁴

The effort to create different zones of spectrum turned out to create dangerous rigidities that have lasted until this very day. In 2005, Thomas Hazlett offered a simple graph that showed huge variations in the intensity of use of different portions of the spectrum, depending upon the uses to which they were assigned.¹⁰⁵ Looking at the spectrum reserved for public uses, the intensity of use is low. Looking at the spectrum that is used by cell phone companies, the intensity of use goes through the roof. Yet there is no set of private transactions that can correct this initial regulatory imbalance, because the spectrum uses are locked in by Federal Communications Commission (“FCC”) allocation rules that are in practice virtually impossible to change, except through contested political action.¹⁰⁶ The greatest single obstacle to technical innovation remains the licensing system of the FCC. With regard to common carriers, the old system remained in place until 1982, when it was undone

100. See Coase, *supra* note 97, at 1–4.

101. Radio Act of 1927, Pub. L. No. 69-632, 44 Stat. 1162 (1927) (amended 1934).

102. DEPT. OF COMMERCE., ADVISORY COMM. ON ZONING, A STANDARD STATE ZONING ENABLING ACT: UNDER WHICH MUNICIPALITIES MAY ADOPT ZONING REGULATIONS (1926), https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/growingsmart/pdf/SZEnablingAct1926.pdf.

103. *Euclid v. Ambler Realty Co.*, 272 U.S. 365, 397 (1926).

104. See ROBERT C. ELLICKSON & VICKI L. BEEN, *LAND USE CONTROLS: CASES AND MATERIALS* 75–76 (3d ed. 2005).

105. Thomas W. Hazlett, *Spectrum Tragedies*, 22 *YALE J. REG.* 242, 248 (2005).

106. Robert C. Barber & Michael P. Goggin, *Spectrum Policy and Its Impact on the Nation's Broadband Future*, *N.J. LAW.*, Oct. 2012, at 11, 12–14.

judicially by Judge Harold Greene in *United States v. AT&T*,¹⁰⁷ which is only the first in a complex set of regulatory maneuvers that lasted for over a generation.¹⁰⁸

A parallel development took place on the broadcast side of the industry, where government regulation blocked the emergence of a “bottom up” system, under which the owner of the frequency, so long as it does not create interference to other users, may shift its uses without first obtaining government approval. One prototype of this system existed in nascent form between 1920 and 1926. Indeed the famous decision in *Chicago Tribune Co. v. Oak Leaves Broadcasting Station, Inc.*¹⁰⁹ sought to adapt the rules of initial occupation applicable to land and chattels to the spectrum. But that initial effort was overwhelmed by two other judicial decisions. First, in 1923, one district court restricted the ability of Herbert Hoover as Secretary of Commerce to withhold licenses from potential new entrants.¹¹⁰ Thereafter, in 1926, a second district court held that the United States lacked the power to impose use restrictions on the individual licensees.¹¹¹ These interferences from multiple frequencies created “chaos” in the broadcast industry that led to the passage of the Radio Act, which was extended seven years later by the 1934 Communications Act,¹¹² where the name change foreshadowed the technology for television. This legislation did, of course, far more than sort out boundary disputes between neighboring licenses. It also established the standard by which these licenses should be granted, renewed, or revoked, which stressed the “public interest, convenience, and necessity.”¹¹³ That standard was duly upheld against constitutional challenge by Justice Felix Frankfurter in *National Broadcasting Co., Inc. v. United States*¹¹⁴ based on his confident judgment that the FCC, like other modern agencies, should not be charged just with setting the rules of the road for the spectrum but also should be put in charge of determining the “composition of that traffic.”¹¹⁵ Frankfurter pointed to

107. *United States v. Am. Tel. & Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1982).

108. For my extended commentary on the case, see RICHARD A. EPSTEIN, ANTITRUST CONSENT DECREES IN THEORY AND PRACTICE: WHY LESS IS MORE 54–73 (AEI 2007).

109. *Chicago Tribune Co. v. Oak Leaves Broad. Station, Inc.* (Ill. Cir. Ct. Nov. 17, 1926) (reprinted in 68 Cong. Rec. 215, 215–219, 69th Cong (2d Sess. 1926)).

110. *See Hoover v. Intercity Radio Corp.*, 286 F. 1003, 1007 (D.C. 1923).

111. *United States v. Zenith Radio Corp.*, 12 F.2d 614, 618 (N.D. Ill. 1926).

112. Communications Act of 1934, Pub. L. No. 73-416, 48 Stat. 1064 (codified as amended at 47 U.S.C. §§ 151–622 (2012)).

113. 47 U.S.C. § 307 (“The Commission, if public convenience, interest or necessity will be served thereby, subject to the limitations of this Act, shall grant to any applicant therefor, a station license provided for by this Act.”).

114. *Nat’l Broad. Co. v. United States*, 319 U.S. 190, 215–16 (1943).

115. *Id.*

The Act itself establishes that the Commission’s powers are not limited to the

the inevitable scarcity of spectrum, which necessarily could not be left open to all. But scarcity is endemic to all resources, and hardly requires that government licenses determine who has what use of a particular resource. Unfortunately, the very idea of putting the spectrum up to bid formed no part of Frankfurter's progressive world view. Seventy years later, no one on the bench, in the agencies, or in the universities has been able to come up with a consistent account of how these frequencies should be allocated.¹¹⁶ The result is major technical rigidity and institutional uncertainty in the property rights regime from which no one benefits in the long run.

There was an alternative path, which was to proceed cautiously by way of analogy to other forms of trespass, making those adjustments necessary to define the permissible levels of interference across frequencies under some version of live-and-let-live, without giving the government power to revoke licenses at will. The correct approach would have been to sell off different portions of the spectrum, subject to these boundary conditions. That proposal was made most notably by Ronald H. Coase in his 1959 article on the Federal Communications Commission.¹¹⁷ But even then, Coase did not think of endowing the spectrum with a full set of property rights that could be sold, leased and mortgaged to one and all. Instead, he conceived of the system as one in which "if there were a market, what would be sold, is the *right to use a piece of equipment to transmit signals in a particular way*. Once the question is looked at in this way, it is unnecessary to think in terms of ownership of frequencies or the ether."¹¹⁸ But in fact the more radical approach of frequency allocation offers the more accurate solution to the underlying problem. Equipment becomes obsolete. There is no reason to tie the use of any given frequency to any given technology. When new equipment allows for better or different uses, just allow those transitions to be made without government intervention. If it turns out that better equipment allows for more content to be transferred over the same band,

engineering and technical aspects of regulation of radio communication. Yet we are asked to regard the Commission as a kind of traffic officer, policing the wave lengths to prevent stations from interfering with each other. But the Act does not restrict the Commission merely to supervision of the traffic. It puts upon the Commission the burden of determining the composition of that traffic. The facilities of radio are not large enough to accommodate all who wish to use them. Methods must be devised for choosing from among the many who apply. And since Congress itself could not do this, it committed the task to the Commission.

Id.

116. *See* Coase, *supra* note 97, at 13; *see also* Hazlett, *supra* note 97 (for the most trenchant criticisms).

117. *See generally* Coase, *supra* note 97.

118. *Id.* at 33 (emphasis added).

it is appropriate to allow the owner of the frequency to subdivide it, taking care to establish parameters to govern potential interference between different users. If it turns out that it makes sense to lease some bits of the spectrum to someone else, it is appropriate that the lease sets both the broadcast content and the choice of equipment. There is, in effect, no reason whatsoever why any government agency should overlook these issues so long as the owner (i.e., no longer a licensee) stays within the appropriate interference levels.

The folly of the opposite position is revealed by *Cosmopolitan Broadcast Corporation v. FCC*.¹¹⁹ The Cosmopolitan Broadcast Corporation designed its program to meet a very important need: to get minority voices on the radio when the major broadcasters like ABC, CBS, and NBC all catered to the median viewer. To achieve that end, the company leased its spectrum to various users for limited periods of time, with heavy concentrations in Spanish- and Italian-speaking users. All in all, broadcasts were made in eighteen different languages at their appointed times, each of which got them an audience to which they could tailor advertising. Apart from regulation, the system is perfectly viable. The contracting device allows for specialized agents to take advantage of their knowledge, generating gains from trade shared across the board.

So what does the FCC think about this innovation? Not much, which is why they shut it down. Why? Because they said it is the duty of a broadcaster to determine content, and you cannot delegate that duty to a set of time brokers who in turn lease it to a set of end users. The position in question runs afoul of basic FCC policy under which “licensees have an affirmative, non-delegable duty to choose independently all programming for broadcast, in light of the tastes and ascertained needs and problems of the community.”¹²⁰ The decision is quite remarkable because it somehow suggests that the delegation by a licensee leads to a deterioration in quality when in fact the opposite is true. But there is no analysis of the soundness of the FCC policy. There is only a rote application of that rule to the particular case.

This instability is not confined to licenses on the broadcast side. It also carries over to the common carrier side, where the fragility of licenses allows for cancellation by the government without, it appears, serious financial repercussions. One illustration of the problem is the ongoing litigation saga over the FCC’s decision to revoke the LightSquared

119. *Cosmopolitan Broad. Corp. v. Fed. Commc’ns Comm’n*, 581 F.2d 917 (D.C. Cir. 1978). I have commented at length on this decision in Richard A. Epstein, *What Broadcast Licenses Tell Us About Net Neutrality: Cosmopolitan Broadcast Co. v FCC*, in *NEW DIRECTIONS IN COMMUNICATIONS POLICY* 86 (R. May ed., 2009).

120. *Cosmopolitan*, 581 F.2d at 921.

license to build out a third telecommunications network.¹²¹ It has provoked just the form of social dislocation, political maneuvering, and senseless litigation that a secure system of property rights would avoid.¹²² This would not have happened if LightSquared had been allowed to purchase the spectrum band from previous owners, at which point the government could have taken it only by paying just compensation for the band. That requirement in turn would have forced it to make a candid and accurate estimate of whether its proposed new use was worth the cost that it takes to put it in play. That bedrock principle of takings law applies as much in the context of spectrum as it does everywhere else, which is why the principles of property law have greater tenacity and wider application than is commonly accepted. In this instance, the claim was made by the firms in the GPS industry that they needed to “listen in” on the LightSquared band in order to do their own work. That willingness to make that claim depends on the ability to acquire it for zero price. Once it becomes clear that they have to pay for what they take, their willingness to make technical innovations that would reduce or eliminate those demands would vastly increase, which makes it highly unlikely that the actual transfer of spectrum would have taken place on the same terms. The social costs of the FCC decision are not small, for they include \$2 billion worth of front-end investments and a business venture that could have transformed the industry, producing a net profit of over \$10 billion for LightSquared, with greater options for its customer base.¹²³

CONCLUSION

It is important to understand the enormous stakes that attach to the proper selection of property rights for various types of resources. The reason why the problem is so difficult is that it is not possible to state in a priori terms what legal regime, either public or private, applies to any given resource. And it is surely a great mistake to assume that in equilibrium all property should be placed in private hands under a regime that gives its owner exclusive rights to control the resource. That

121. See *LightSquared Saga Shows Problems with U.S. Spectrum Policy: View*, BLOOMBERG VIEW (Feb. 6, 2012, 7:01 PM), <http://www.bloombergtv.com/articles/2012-02-07/lightsquared-saga-illuminates-problems-with-federal-spectrum-policy-view> (reviewing the background of the LightSquared and FCC issues).

122. For discussion, see Thomas W. Hazlett & Brent Skorup, *Tragedy of the Regulatory Commons: LightSquared and the Missing Spectrum Rights*, 13 DUKE L. & TECH. REV. 1 (2014). See also Richard A. Epstein, *Possession and Licenses: The FCC, Weak Spectrum Rights and the LightSquared Debacle*, in *LAW AND ECONOMICS OF POSSESSION* 237–265 (Yun-chien Chang ed., 2015).

123. For a brief discussion, see Epstein, *supra* note 2, at 409.

assumption is a good *first approximation* with respect to land, chattels, and animals, but it is always one that is subject to modification that deals with the roadblocks that this system could otherwise produce. It is also the case that with water, air, and beaches, some kind of a commons solution appears to work, but once again it is subject to pressures that push in the direction of limited privatization. It takes constant awareness to make sure that the balance does not move too far in the one direction, or too far in the other. Yet, the only way that the correct balance can be maintained is to be aware that even in the natural law system, property rights have both dynamic and stable features. It is the task of good analysis and good decision-making to be aware of the twin dangers that drive the system: the dangers of externalities on the one side and holdouts on the other. That simple guide is not a solution to all problems. But it does offer a convenient jumping off point for an analysis more general than the one that can be offered here.