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RADIO FREE ROTHBARD

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> The human right of a free press depends upon the human right of private property in newsprint.
>
> — Murray N. Rothbard, 1973
> *For a New Liberty*

IN ALMOST EVERY DISCUSSION of the FCC specifically, or American spectrum policy in general, someone will assert that radio spectrum is a unique resource that belongs to the public. This will be said as if it were axiomatic—a starting point rather than the historical consequence of special interests pretending to misunderstand economics. More harm has been done to the public in the name of "the public interest" than could ever have been done by private interests in a free market. Yet the public tends to call for more intervention instead of less. The case of radio is typical.

I will attempt to review, from a Rothbardian perspective, the history, economics, and potential future of American wireless technology.

CENTRAL REGULATION—*CUI BONO*?

Murray Rothbard made the following distinction between shallow and deep conspiracy theories: the shallow theorist asks *cui bono*?—who benefits?—and then assumes the hidden beneficiaries were responsible; the deep theorist also asks *cui bono*? but then looks for documentary evidence that the beneficiaries really were pulling the strings.

"Scholarship," Rothbard quipped, "is essentially confirming your early paranoia through a deeper factual analysis."[1]

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[1]From a lecture at Polytechnic University in the 1970s on the economics of labor and labor regulation. I assume it was part of Rothbard's regular teaching duties for basic economics. You can download the audio file here: http://www.mises.org/multimedia/mp3/rothbard/R6-16m.mp3.

So who benefits from the United States government's central regulation of American radio spectrum? One answer is clearly that the federal government itself benefits. Whenever allocation is moved from economic to political means, politicians will gain in a variety of ways: monetary and nonmonetary, legal and extralegal.

And central regulation of any communications medium means that censors benefit from the political control they're denied under a private property regime. In 1974, *FCC v. Pacifica Foundation* (better known as the George Carlin "Seven Dirty Words" case) the Supreme Court decided in favor of "decency" restrictions in broadcasting, which for three decades now has, in the words of the Electronic Frontier Foundation, "established the FCC as the largest censorship body in the world" (EFF Legal Cases—*FCC v Pacifica*).

Another beneficiary of regulation—obvious to free-market economists but surprising to others—is the regulated industry itself. Through the phenomenon of "regulatory capture" the existing corporate interests use the regulatory body as a cartelizing agent. Not only does the regulatory body act as a barrier to entry, lowering competition and raising prices, but it also blocks innovations that might threaten industry leaders.

When FM radio was invented, the established AM broadcasters had the FCC suppress it for decades because they did not hold the patents to the new high-fidelity technology and saw it as a threat to television, for which they did hold the patents.[2] The same corporations made sure cable TV was a nonstarter for another few decades. AM and FM broadcasters lobbied to block Satellite Radio, claiming that the public interest demanded "localism," but National Public Radio lobbied to block the most "localist" radio option around: lower-powered FM micro broadcasters.

So there are our two candidates for a conspiracy theory: Big Government and Big Business.

THE DAMAGE—*CUI MALO*?

If you think the censorship is limited to foul language and flashing, you might find the FCC's case history sobering:

[2]See Walker 2001. Mr. Walker guided me to the main sources for the history of the FCC, Coase's theories, Hazlett's revision, and the advocacy of Open Spectrum. He is managing editor of *Reason* magazine, where he writes about communications and media policy, technology, and intellectual property.

- In 1931, an Iowa broadcaster was denied renewal of his license because of his "bitter personal attacks on persons and institutions he did not like." The FCC wrote, "Though we may not censor, it is our duty to see that broadcasting licenses do not afford mere personal organs, and also to see that a standard of refinement fitting our day and generation is maintained" (Coase 1959, p. 9). (We can't censor you, but we can keep you off the air?)
- In 1940, the FCC established "The Mayflower Doctrine" which threatened to deny renewals to any station that expressed political opinions (Ibid., pp. 9–10). (In 1948 the Commission re-examined the Mayflower Doctrine. They agreed that their policies abridged political freedoms, but they insisted that this was necessary!)
- In 1947, the New York *Daily News* applied for a broadcast license. The American Jewish Congress petitioned the FCC to deny the license because the *Daily News* had "evidenced bias against minority groups, particularly Jews and Negroes." The FCC claimed to reject the application on different grounds, but as economist Ronald Coase would later comment, "What seems clear is that a newspaper which has an editorial policy approved of by the Commission is more likely to obtain a radio or television license than one that does not" (Ibid., p. 11).
- When Edward Lamb's license came up for renewal in 1954, the FCC charged him with having Communist associations, which he denied. In this case, the FCC did renew his license, but insisted that it needed "character and candor requirements" for licensing decisions, and that they had both the right and responsibility "to inquire into past associations, activities, and beliefs" of broadcasters[3] (Ibid.).
- In the late 1960s, the FCC threatened a major radio station in Hawaii with nonrenewal of their license. KTRG had been broadcasting libertarian programs for several hours a day for approximately two years. The legal costs for fighting the FCC's decision forced the owners to shut down the station permanently in 1970 (Rothbard 2005, p. 126).

Rothbard writes, "Can we imagine the outcry if the federal government were to put a newspaper or a book publisher out of business on similar grounds?" (Ibid., p. 126).

He notes:

> Because every station and every broadcaster must always look over its shoulder at the FCC, free expression in broadcasting is a sham. Is it any wonder that television opinion, when it is expressed at all on controversial issues, tends to be blandly in favor of the "Establishment"? (Ibid., p. 120)

But, you might say, certainly corrupt politicians, zealous censors, and the phenomenon of regulatory capture aren't enough to require a conspiracy theory. Imperfect government isn't something we need malicious intent to explain, just human nature. Didn't the government need to step in to halt the growing *anarchy of the airwaves*?

THE HISTORY

> Until lions have storytellers,
> tales of the hunt shall glorify the hunter.
>
> — African Proverb

Contrast these two versions of the mid-1920s:

> (1) The chaos that developed . . . was indescribable. . . . Private enterprise, over seven long years, failed to set its own house in order. Cut-throat competition at once retarded radio's orderly development and subjected listeners to intolerable strain and inconvenience. (Siepmann 1950, cited in Coase 1959, p. 13)

> (2) One of our troubles in getting legislation [to nationalize the airwaves] was the very success of the voluntary system we had created. Members of the Congressional committees kept saying, "it is working well, so why bother?" (Hoover 1952, cited in Hazlett 1990, p. 143)

There's the history of radio regulation, and then there's the history of the various versions of that history: there's what was perceived to be going on in the 1920s as it happened; there's how the story was revised into an official history by the 1950s (which is *still* the version most people know—if they know any version at all); there's how the official history was reinterpreted by free-market economists in the 1950s and '60s (the "error theory" of spectrum regulation), and then there's economist Thomas Hazlett's 1990 revision in the *Journal of Law and Economics*, which Rothbard would have praised as a deep conspiracy theory.

Before 1920, radio was used for point-to-point wireless telegraphy. The Navy sought legislation to put all wireless stations under the control of the federal government, but recognized "that such a law passed at the present time might not be acceptable to the people of this country" (Senate Report No. 659, 61st Cong., 2d Sess. 4 1910 cited in Coase 1959, p. 2).

The Radio Act of 1912 reserved about half of the useable spectrum for the government. Private stations could use the rest, as long as they had a license from the Secretary of Commerce. These licenses were more like registration receipts than permits: the Secretary had no powers to deny or regulate licenses, nor to refuse renewal.

Professional radio voice broadcasts began in the United States in November 1920, and within two years, there were 576 licensed broadcast stations.[3]

In 1922, Secretary of Commerce Herbert Hoover initiated a series of annual radio conferences, attended by major broadcasters and orchestrated by the Department of Commerce. At the first such conference, L.R. Krumm of Westinghouse complained that it was "perfectly possible to establish a so-called broadcasting station for about $500 or $1,000 initial investment" (Walker 2001, p. 32). The programming from these upstarts consisted of "nothing but phonograph records, and that sort of station can interfere very disastrously with such a station as we are trying to operate." And just in case his meaning wasn't clear, Krumm added, "I believe 12 good stations, certainly a maximum of 15, would supply most of the needs of the country" (Emord 1991, p. 150, cited in Walker 2001, p. 32).

Hoover began to withhold additional licenses, claiming the need to prevent interference among broadcasters. A 1923 federal court case, *Hoover v. Intercity Radio*, denied him the authority to withhold licenses, but allowed the Secretary to select times and wavelengths so as to minimize interference (Coase 1959, pp. 4–5).

For the next three years, Hoover continued to ration broadcasting licenses by assigning frequency, geographic location, and time of day (in keeping with the *Intercity* verdict), and even by refusing (in defiance of *Intercity*) to process new license applicants.

Hoover's annual broadcast conferences continued and in 1925 they outlined a policy agenda in which they advocated a "public interest" standard for licensing.

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[3]Amateurs had already been experimenting with voice broadcasts for the past decade.

Later that year, the Secretary stopped issuing new licenses, claiming that the spectrum was completely filled. As Jesse Walker notes, "he invited a court challenge" (Walker 2001, p. 33).

The Zenith Radio Corporation—later Zenith Electronics—was unhappy with their assigned schedule and priority. (Hoover's assignment gave General Electric an override option on the allotted time granted in Zenith's broadcast license.) Zenith chose to ignore the restrictions on its license, and criminal proceedings were initiated against it for violation of federal law.

In April 1926—*United States v. Zenith Radio Corp.*—the court again denied Hoover the authority to regulate licensure and this time—contrary to *Intercity*—they explicitly denied him discretion over time and wavelength assignment as well. Because the Intercity and Zenith decisions conflicted, Hoover asked the acting Attorney General of the United States for an interpretation of the law. The Attorney General declared that the federal government had no authority to define *any* rights to spectrum.

Hoover still had the option to appeal the Zenith decision, but he didn't. Given the energy and persistence with which he'd pursued his regulatory vision, it's important to ask why he didn't. What he did instead was issue licenses to all applicants, free of price and free of restrictions (Coase 1959, p. 5).

"Faced with open entry into a scarce resource pool," writes Hazlett, "a classic 'tragedy of the commons' ensued" (Hazlett 1990, p. 141).

Stations could now choose whatever frequency, geographical location, broadcast schedule, and amplification level they wanted.

This radio chaos (which our conspiracy theory would argue was a deliberate crisis created by Hoover to justify the nationalization of the airwaves) lasted less than a year.

The official history points to the Federal Radio Act of 1927 as the solution to the crisis. The Act established the Federal Radio Commission, which later became the Federal Communications Commission. The airwaves were declared public property and put under the guardianship of the Commission, which was given the authority to issue temporary licenses to those who were willing to broadcast "in the public interest"—just as the Big Broadcasters had proposed two years earlier.

Later historians, such as Charles Siepmann, quoted above, would claim that the nationalization was necessary because the free market had failed. But markets are based in property rights. The tragedy of the commons isn't a symptom of too much market; it is the result rather of not enough private property. All allocation of

scarce goods will be most efficiently handled by the price system—so long as enforceable property rights are well defined.

And in the fall of 1926 the precedent for defining and defending those rights had been established in an Illinois court: *Tribune Co. v. Oak Leaves Broadcasting Station*. Writes Hazlett, "the classic interference problem was encountered, litigated, and overcome, using no more than existing common-law precedent" (Ibid., p. 149).

The Chicago *Daily Tribune*, calling itself WGN—"World's Greatest Newspaper"—broadcast entertainment as a means of marketing its publication: each day's edition listed that evening's programming.

WGN filed a complaint in state court against another radio station, *Oak Leaves*, which had begun broadcasting in an adjacent wavelength. WGN claimed that it was necessary to maintain at least a 50-kilocycle separation between stations located within 100 miles of each other. They accused the *Oak Leaves* station of injuring their lawfully acquired business property (Ibid., p. 149).

Chancellor Francis S. Wilson decided the case in the tradition of property rights to common resources. His landmark decision, which established homesteading rights in "the ether," found precedent in western water rights, among other established property traditions. Wilson concluded the court was

> compelled to recognize rights which have been acquired by reason of the outlay and expenditure of money and the investment of time. . . . We are of the further opinion that, under the circumstances in this case, priority of time creates a superiority in right. (Ibid., p. 150)

So the official history has it exactly backwards. The free market didn't create a crisis that the government solved. The government created the crisis and the assignment of property rights was about to fix it. And as soon as the government realized this, they rushed in to keep the private solution from happening:

> The Congress responded to *Oak Leaves* instantly. After years of debate and delay on a radio law, both houses jumped to pass a December 1926 resolution stating that no private rights to ether would be recognized as valid, mandating that broadcasters immediately sign waivers relinquishing all rights, and disclaiming any vested interests. The power to require such was the interstate commerce clause, but the motive was that Congress was nervous that spectrum allocation would soon be a matter of private law. (Ibid., p. 160)

BAD ECONOMICS: THE MYTH OF SCARCITY

> It is conventional among economists to be polite, to assume that economic fallacy is solely the result of intellectual error.
>
> — Murray N. Rothbard 1995
> *Making Economic Sense*

One of the strangest aspects of the official history is the complete economic illiteracy required to accept it. According to the official history, cited later by the Supreme Court, the reason the airwaves were declared public property and required central regulation "in the public interest" is that radio spectrum is a scarce resource.[4]

Even ignoring for now the artificial scarcity created by the government itself (by claiming the bulk of useable spectrum for the military, by refusing to expand the broadcast band, by suppressing FM and other more efficient technologies, by removing any economic incentive to efficient innovation, etc.), how is scarcity a justification for taking a resource out of the price system?

The economic definition of scarcity is this: when the price of a good is zero, demand exceeds supply. Only if the supply of free goods exceeds the demand for free goods do we say those goods are not scarce.[5]

The price system is that which balances supply and demand for scarce goods. If property rights are defined and enforceable—and we see that in the *Oak Leaves* decision they were starting to be—then pricing will serve not only to allocate scarce resources, but to promote the very future innovations needed to make a resource less scarce.

If the demand for apples goes up, apple producers—both established growers and newcomers drawn by rising prices—will grow and sell more apples, driving prices lower. Those who can produce

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[4]Justice Byron White: "Before 1927, the allocation of frequencies was left entirely to the private sector, and the result was chaos" (*Red Lion v. FCC*, quoted in Hazlett 1990, p. 139). Hazlett adds, "This reasoning piggybacked on Felix Frankfurter's 1943 NBC decision." Red Lion was the famous "Fairness Doctrine" case of 1964, in which the Court declared that "differences in the characteristics of new media justify differences in the First Amendment standards applied to them." On August 4, 1987, the FCC repealed most aspects of the Fairness Doctrine, but the Commission is still divided on the merits of the Red Lion case (*Tech Law Journal* 2003).

[5]Free like beer, not free like speech. I.e., zero-priced.

apples most efficiently will profit the most, promoting efficient apple growth.

This works for fixed resources as well: if the demand for land goes up, driving up the price for land, developers will find ways to build on land that was considered "undevelopable" only recently. They will move into the third dimension, build taller buildings or underground complexes to house more people in less acreage. They will even create artificial islands and peninsulas to increase the supply of land.

For any resource, the physical supply is only one factor in determining the economic supply. If you can create gasoline engines that get the same power from half as much gas, the economic supply of petroleum has effectively doubled.

Changes in technology affect the balance of supply and demand, and with less interference in the market, the increase in supply tends to outpace increases in demand. There is nothing in the nature of radio waves that makes them an exception. (Note, for example, that Amplitude Modulation and Frequency Modulation are noninterfering ways to use the same signals. The invention of FM radio technology is an example of innovation expanding the economic supply of a resource.)

HISTORY REDUX: UNDOING THE "ERROR THEORY"

> In general, I urge everybody to look at a government measure . . . not in terms of a tragic failure to achieve the common good, public interest, or general welfare, but [rather] as a conscious agency for doing all sorts of monopolizing, cartelizing, and other restrictive things. In other words, the government is not that dumb!
>
> — Murray N. Rothbard 1970s classroom lecture

In 1934 the Federal Radio Commission became the Federal Communications Commission, and Congress added to its charter the regulation of telephone and telegraph industries. Clearly the scarcity of radio spectrum was no longer the justification for its existence, though that excuse would still be used in later court cases.

After World War II, commercial television was born. The established AM broadcasters became the established TV broadcasters. The same Big Broadcasters who had originally suppressed FM radio technology now had the FCC reassign all of FM radio to a part of the spectrum that FM radio receivers couldn't receive. The old FM spectrum they turned over to new television channels.

In 1951, Leo Herzel, a law student at the University of Chicago, first proposed, while commenting on the allocation of VHF channels for color TV, that auctioning frequency channels to the highest bidders would be better than the FCC's established methods of political allocation. He wrote,

> The most important function of radio regulation is the allocation of a scarce factor of production—frequency channels. The FCC has to determine who will get the limited number of channels available at any one time. This is essentially an economic decision, not a policing decision. (Herzel 1951, p. 809)

Dallas Smythe, former chief economist for the FCC, wrote in response to Herzel,

> Surely it is not seriously intended that the non-commercial radio users (such as police), the non-broadcast common carriers (such as radio-telegraph) and the non-broadcast commercial users (such as the oil industry) should compete with dollar bids against broadcast users for channel allocations. (Ibid., p. 15)

Herzel replied,

> It certainly is seriously suggested. Such users compete for all other kinds of equipment or else they don't get it. I should think the more interesting question is, why is it seriously suggested that they shouldn't compete for radio frequencies? (Coase 1959, p. 16)

Ronald Coase, later to win a Nobel Prize and become the founder of Chicago School legal theory, was not originally convinced by Herzel's suggestion. But he found Smythe's response so unpersuasive—"if this was the best that could be brought against his proposal, Leo Herzel was clearly right"—that Coase adopted the pro-auction position for which he became famous in legal and economic circles.[6]

In 1959 Coase published the landmark article, "The Federal Communications Commission," in the *Journal of Law and Economics*. After expressing serious concerns about First Amendment issues under central regulation of the airwaves, Coase reviews the early history of broadcast radio, including the *Oak Leaves* decision and the federal government's response. He cites Professor Siepmann's version of the history—"Private enterprise, over seven long years, failed to set its own house in order"—but Coase concludes that the government and its historians based their regulatory views "on a misunderstanding of the nature of the problem" (Ibid., pp. 13–14). He goes on

[6]Quoted in Hazlett (1998, p. 538). Coase would become even more famous in legal and economic circles for his theory of social cost, published one year later, but based on his FCC article.

to present the argument for an efficient market based on property rights in radio spectrum.

In other words, the government and its historians have the problems right, but get the solution wrong—central planning and regulation are inferior to the price mechanism. Nothing in the nature of radio defies property rights. "The problem of radio interference was examined by analogy with electric-wire interference, water rights, trade marks, noise nuisances, the problem of acquiring title to ice from public ponds, and so on." So, asks Coase, "If the problems faced in the broadcasting industry are not out of the ordinary, it may be asked why was not the usual solution . . . adopted for this industry?" (Coase 1959, pp. 30–31).

Thomas Hazlett, publishing 31 years later in the same journal, calls Coase's implied answer the "error theory" of history: Herbert Hoover and the U.S. Congress had their hearts in the right place, but didn't have the economic literacy to realize they were making the situation worse (Hazlett 1990, p. 134).

If the regulators hadn't had economic literacy back in the 1920s, they weren't doing much better in 1959. The FCC invited Coase to present his proposals to them. Their first question: "Is this all a big joke?" (Hazlett 2001, p. 337).

But while the government dismissed Coase's auction proposals, his article started a small revolution in the academy, where the power of property rights and free pricing was treated as a radical new idea.[7]

Not only were Coase's proposals not new in the larger economic context, they weren't even new in the specific context of radio. A quarter century earlier, before the seizure of the airwaves, the *American Economic Review* had already seen homesteading and enforced property rights as the solution:

> Are we not simply dealing with space in a fourth dimension? Having reduced space to private ownership in three dimensions, should we not also leave the wave lengths open to private exploitation, vesting title to the waves according to priority of discovery and occupation? (Hazlett 1990, p. 174)

In 1969 economist Arthur DeVany, working with engineers and legal experts, put together what Murray Rothbard called "The best and most fully elaborated portrayal of how private property rights could be assigned in radio and television" (Rothbard 2005, p. 126).

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[7]This while Ludwig von Mises was being called "a Neanderthal" for his free-market positions.

The irony, given Rothbard's enthusiasm for the proposal, is that the authors wrote it "while consultants to the staff of the President's Task Force on Communications Policy" (DeVany et al. 1969, pp. 1499–561).

If DeVany and company were disappointed that their proposal to the government was ignored, then they were operating under the delusion of Hazlett's "error theory of federal licensing," which

> holds that government frequency assignment, while logically uncompelling as a solution to the common property problem in spectrum allocation sans property rights, was a logical—if naïve—response to a series of regulatory events that occurred in the early days of commercial radio broadcasting. (Hazlett 1990, pp. 138–39)

But, says Hazlett, "The fact [is] that the policy debate was led by men who clearly understood—and articulated—that interference was not the problem, interference was the opportunity" (Ibid., p. 162). With more documentary evidence than I can include here, Hazlett concludes his revision of early radio history by claiming that with all its cartelizing consequences, its twisting of the First Amendment, and its suppression of technological advance, the government appropriation of the spectrum "was not a reflection of technical incompetence but of self-interested rationality" (Ibid., p. 175).

ROTHBARDIAN PROPERTY THEORY

> There is no existing entity called "society"; there are only interacting individuals. To say that "society" should own land or any other property in common, then, must mean that a group of oligarchs—in practice, government bureaucrats—should own the property, and at the expense of expropriating the creator or the homesteader who had originally brought this product into existence.
>
> — Murray N. Rothbard 2005
> *For a New Liberty*

Homesteading: Rothbard versus Locke

Before we address the question of privatization—the transition from government-held resources to privately held property titles—we need to address the more basic question of private property itself. Specifically, how does legitimate property come into being?

Strictly speaking, economics has nothing to say on the legitimacy or illegitimacy of property. As a value-free science, economics is the study of cause and effect in the realm of human action. The Austrian School does this through the deductive, or praxeological method, while mainstream economists claim to study the question

empirically. The desirability of the effects and the legitimacy of the causes are questions left to esthetics, psychology, and moral philosophy. Without prescribing values, Ludwig von Mises considered it obvious which outcomes rational individuals would seek, given an understanding of cause and effect in the economic sphere.

Mises's student, Murray Rothbard, did not share Mises's confidence that informed rational individuals would make peaceful choices and he was quite willing to integrate individualist ethics with Misesian economics. Thus it is Rothbardian property theory to which we turn in our inquiry into the legitimacy of ownership.

If bandits ride into a village and take over, they will certainly act as if they now own the village, but clearly violent confiscation can't have created legitimate property. We would say that the village had been *stolen*—taken, in other words, from the legitimate owners: the villagers. But to agree that the villagers are the legitimate owners, no matter what the *de facto* situation, is to leave open two vital questions: we still don't know *how* the villagers became the legitimate owners, and more fundamentally, we haven't addressed the question of *who* can legitimately own property—the individual or a collective.

Despite all the political language to the contrary, there is no rights-bearing entity called "society." Neither can a collective entity called "the villagers" have legitimate property rights. When we speak of the villagers as the legitimate owners, we use the collective noun for linguistic convenience. It's easier than saying Villager 1 owns village subsection A, Villager 2 owns village subsection B, etc.[8]

The individual members of a group can hold divisible property titles to a single piece of property, but we'll come back to that later.

Rothbardian property theory borrows from the common law tradition, which found its most famous expression in the writings of John Locke: unowned land becomes private property when an individual "mixes his labor" with the land, such as a farmer clearing a

[8]The following passage and most of Rothbardian property theory can be found in Rothbard's libertarian manifesto, *For a New Liberty*, cited above.

> Furthermore, if the original land is nature- or God-given then so are the people's talents, health, and beauty. And just as all these attributes are given to specific individuals and not to "society," so then are land and natural resources. All of these resources are given to individuals and not to "society," which is an abstraction that does not actually exist. There is no existing entity called society; there are only interacting individuals. (p. 41)

field, or anyone building a house on previously unowned acreage (Rothbard 2005, p. 37).

This "homesteading" is the first legitimate way to acquire property. The only other way is through voluntary exchange with legitimate property owners.

Where Rothbard takes issue with John Locke's homesteading theory is in the "Lockean Proviso" which would restrict a homesteader's property rights to only those appropriations that leave "enough and as good" for others. Rothbard calls this Locke's "unfortunate proviso" and demonstrates that taken literally, the restriction disallows *all* private property, since it will be impossible, no matter how little one takes, to leave "enough and as good" for others (Rothbard 1998, chap. 29).

Property Units: Rothbard versus Common Law

Rothbard's main departure from common law tradition is his disagreement with the common-law principle "that every landowner owns all the airspace above him upward indefinitely unto the heavens and downward into the center of the earth. In Lord Coke's famous dictum: *cujus est solum ejus est usque ad coelum*; that is, he who owns the soil owns upward unto heaven, and, by analogy, downward to Hades" (Rothbard 1982, pp. 84–85).

But according to Rothbard, the *ad coelum* rule never made any sense in the context of homesteading: "If one homesteads and uses the soil, in what sense is he also using all the sky above him up into heaven? Clearly, he isn't" (Ibid.).

If land property doesn't legitimately extend forever upward and downward, then how far does it extend? Even before facing this question, we need to confront the more immediate problem of the size of the area to be homesteaded. Can I fence off an arbitrarily large area of unowned land and claim it as new property? And what does any of this have to do with radio spectrum? The answer to all three questions lies in Rothbard's concept of the *relevant technological unit*.

Relevant Technological Unit: Rothbard versus DeVany et al.

> In a certain sense the development of radio has opened up a new domain comparable to the discovery of a hitherto unknown continent. . . . And private interests are trying to obtain control of wave lengths and establish private property claims to them precisely as though a new continent were opened up to them and they were securing great tracts of land in outright ownership.
>
> —Walter S. Rogers
> Cited in Coase 1959

Rothbard writes:

> If A uses a certain amount of a resource, how much of that resource is to accrue to his ownership? Our answer is that he owns the technological unit of the resource. The size of that unit depends on the type of good or resource in question, and must be determined by judges, juries, or arbitrators who are expert in the particular resource or industry in question. (Rothbard 1982, p. 84)

What is a technological unit? It is the minimum amount necessary (in whatever relevant dimension) for the use of the property, "enough of it so as to include necessary appurtenances." This unit will vary according to the uses the owner has in mind, and the features of the resource being homesteaded. Rothbard's own example is immediately helpful to us:

> For example, in the courts' determination of radio frequency ownership in the 1920s, the extent of ownership depended on the technological unit of the radio wave—its width on the electromagnetic spectrum so that another wave would not interfere with the signal, and its length over space. The ownership of the frequency then was determined by width, length, and location. (Rothbard 1982, p. 84)

The concept of the technological unit answers another question that sometimes comes up in discussions of private property: if your radio signals enter my home, uninvited, have you committed a trespass against my property?

Frank van Dun, writing in a different context, notes: "Murray Rothbard wisely cut short such an interpretation by insisting that 'property' is a praxeological, not a physicalist concept. Consequently, one's property is only in 'means of action,' not in things as such" (van Dun 2003, p. 66, n. 5).

Thus the Rothbardian concept is radically different from how we're used to thinking about property. It is not a physical object, nor a rigidly defined spatial boundary; it is "not in things as such," but an exclusive claim to the use of a scarce resource, a claim to the *means* of human action.

It happens that with solid objects and land property, the physical concept and the praxeological concept yield similar results. There isn't much practical difference between my ownership claim to a chair and the claim to exclusive authority over use and disposal of that chair.

It isn't until we confront questions of common resources, such as air, water, fish and game, oil, electricity, and radio waves that we're forced to shift from an object-based view of property to a priority-of-use conception of the problem.

Some important ways in which Rothbard's technological unit differs from the *ad coelum* physical/spatial conception of property:

- My land property isn't violated by radio transmissions crossing its borders, nor by airplanes passing overhead, so long as neither one affects my use of my land.
- If my neighbor builds a factory on his property, any pollution, noise, vibrations, etc. that affect my use of my property count as trespass and he has to either stop or compensate me, at my discretion, but the physical trespass is not sufficient to be property trespass; neither is physical trespass necessary: if my business depends on wind or sunshine, a new neighbor's obstruction of those things will count as a violation of my property.
- If my neighbor drills for oil in his back yard and finds an untapped pool that extends under my land, I have no claim to the oil, so long as his drilling doesn't disrupt my use of my property. If I tap into that same oil deposit, I am violating his property. But I can drill down into non-contiguous deposits next to his and they become my property even if they extend beneath his land.

DeVany et al., did not use homesteading in their proposal to the presidential commission. Neither did they accept the Rothbardian theory's implications for trespass. Their understanding of property rights is Coasean, which we'll come to in the next section. But where their proposal is relevant to Rothbardian privatization is in their detailed proposal for the relevant technological unit of broadcast property. They call their units "TAS packages," where TAS stands for Time, Area, and Spectrum, meaning: (T) when a transmission is allowed, (A) in what geographical area it may exceed a certain power, and (S) at what frequency.

Their proposed TAS units are similar to the homesteading rights recognized in the 1926 *Oak Leaves* court case, with one notable difference. In the early days of broadcast radio, few stations transmitted 24 hours a day. If the ABC Company used a certain frequency in New York between midnight and noon, the XYZ Company was free to homestead the same frequency between noon and midnight. The market process was already leading toward 24-hour-a-day spectrum rights, because the ABC companies would often buy out the XYZ companies. But time was definitely considered one of the homesteadable dimensions in spectrum property. DeVany's proposal is for all spectrum property to be defined at first as all-day and in perpetuity,

although the owner of a TAS package would then be free to sell the rights to a fraction of his broadcast day.

So should a property title in radio spectrum start as an all-the-time right and break apart, as necessary, through the market process, or should time be a homesteadable dimension from the outset?

Contrary to DeVany et al., the homesteadable unit is however much of the resource is necessary to the initial use of the homesteader. If I transmit a traffic report on an unused frequency at the beginning and end of the workday, but never use the channel at midnight, then you will not be trespassing by using "my" channel at midnight.

And if you transmit on a certain channel 24 hours each day, and I manage to encrypt a signal on the same channel in such a way that it doesn't interfere with your transmissions, nor with the reception of your listeners, I have not trespassed any more than my neighbor trespasses by taking unclaimed oil reserves from beneath my yard.

The DeVany proposal is an attempt to design a market, at least at its inception. The FCC should, according to DeVany, auction saleable, divisible TAS packages to the highest bidders and let the market work from there. Rothbard admired the proposal enough to recommend it to his readers—and it's certainly better than the status quo—but a true free market in legitimate property titles would have to evolve from the homesteading bottom up, not from a presidential commission down.

Getting the technological unit wrong can have devastating consequences, and there's already historical precedent for having the wrong unit statically defined in Washington.

In 1861, U.S. federal land law provided a homesteadable unit of 160 acres. Anyone who, over a certain term, cleared and used 160 acres previously held by the federal government became the recognized owner of that property. This may have been the correct unit for the wet, arable lands of the East, but when settlers reached the dry prairie, 160 acres was far too little for any viable ranching or grazing.

The federal government refused to expand the 160-acre unit to allow the homesteading of larger ranches out West. As a result, the unowned grasslands were used and overused with no title ownership. The famous "open range" of cowboy stories was in fact a tragedy of the commons, with cattlemen grazing too early in the season, no one wanting to risk the wait since everyone else could continue to graze early. Neither was it in anyone's interest to restore or replant the grass, since there was no legal way to keep a second man from reaping what the first man had sown (Rothbard 2005, p. 312).

To avoid repeating the error of grassland history, we should reject any centrally mandated, static definition of the property unit, no matter how informed and considered the definition seems to be. Instead, DeVany's TAS package proposal should be treated as an *amicus brief* to the civil courts that will have to settle property disputes in radio spectrum.

Trespass: Rothbard versus Coase

> Current free-market economics is all too rife . . . with scorn for ethics, justice, and consistent principle; and with a willingness to abandon free-market principles at the drop of a cost-benefit hat. Hence, current free-market economics is generally envisioned by intellectuals as merely apologetics for a slightly modified status quo, and all too often such charges are correct. (Rothbard 2005)

DeVany's 1969 spectrum privatization proposal expanded not only on Coase's groundbreaking 1959 article on the FCC, but also on the 1960 article for which Coase would later win the Nobel Prize.[9]

In "The Problem of Social Cost," Coase presents the paradigm of what would become Chicago School legal theory. If a farmer's wheat fields are next to the railroad tracks, and sparks from a passing train set the wheat on fire, has the train company committed a trespass, and if so, what actions can be taken against it?

Different legal theorists might come up with different answers, but before Coase, the answers would likely have been rights-based. The Coasean answer is not based in property rights per se but rather in the concept of *social cost*.

For Coase, the answer to the sparks and wheat conflict is whatever resolves the problem at the least cost. You might ask, *cost to whom*? Coase's answer: *cost to society*.

> We are dealing with a problem of a reciprocal nature. To avoid the harm to B would inflict harm on A. The real question that has to be decided is: should A be allowed to harm B or should B be allowed to harm A? The problem is to avoid the more serious harm. (Coase 1960, p. 2)

In other words, it is not only the case that the mugger harms me if he takes my wallet, but also that I harm the mugger if I keep him from doing so. The question of social cost is: does the thief gain more than the victim loses? If so, then society benefits from the mugging.

[9]In 1991, Ronald Coase was awarded the Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel "for his discovery and clarification of the significance of transaction costs and property rights for the institutional structure and functioning of the economy."

If not, then society is hurt by the mugging. Any claim I might make that the wallet is mine by right is irrelevant to the question of social cost: "The comparison of private and social products is neither here nor there" (Coase 1960, p. 34).

We might go on to say that the mugging has negative costs beyond the immediate context, that society loses out if I now divert critical energy into protecting myself from muggers, or if the location of the mugging develops a bad reputation and business is harmed. But the cost-benefit analysis is to be done in a value-free, utilitarian calculus, without any interfering concepts of right or wrong.

"When an economist is comparing alternative social arrangements, the proper procedure," according to Coase, "is to compare the total social product yielded by these different arrangements" (Ibid.).

So if the farmer can move his crops out of spark range at an annual cost of a thousand dollars, while the spark suppression system would cost the train company two thousand, then there is a thousand-dollar "social cost" to ruling in the farmer's favor. In other words, "society" spends twice as much if the farmer wins.

Of course, minimizing social cost does not require an all-out victory or defeat for either side. The train company can pay the farmer $1,000 each year to compensate for the unplanted crops. Or they could split the difference. Who pays how much is irrelevant to the question of social cost, however relevant it may feel to the farmer.

The Coasean theory may not have found full expression until the mid-twentieth century, but British courts ruled according to similar reasoning in the previous century, when English farmers brought action against the new factories that were dumping soot on their crops. The court recognized the farmers' common law property right to stop the pollution, but found instead that "society" needed the new factories too much to rule against the polluters (Rothbard 1973, pp. 262–63).

Rothbard, of course, rejects the entire social cost theory. There is no cumulative "cost" borne by "society"—there is only the cost to individuals. You can't sensibly add my pain to your pain and deduce a measurable sum called *our pain*. Same with pleasure. Same with value. Same with costs.

According to Rothbardian property theory—and yes, he realized he wasn't being value-neutral—the solution to the case of the train company and the farmer has everything to do with who was there first. If the farmer's crops have been growing on that same acreage for decades, and the railroad company acquired the neighboring property only a few years ago, then the trains' sparks constitute trespass. If, on the other hand, the farmer knowingly acquired property

next to the railroad tracks and decided to plant his crops within spark range, he has to bear the cost of that decision himself.

This difference in property rights theory becomes relevant in the DeVany proposal in the section called "Intermodulation interference":

> The phenomenon of intermodulation has no close parallel in other resources. It occurs when radio signals transmitted on two different frequencies cause interference to an operator using the same time and area combination but a third, distinct frequency.
>
> For example, suppose radio operators D, E, and F locate their transmitters on the same mountain and serve roughly the same area. Assume that operator D transmits at a frequency of 100 MHz, operator E at 150 MHz, and operator F at 250 MHz. It is possible that D's and E's signals will combine via intermodulation to interfere with F's signal even though F's equipment is tuned to transmit and receive signals at 250 MHz only. (DeVany et al. 1969, p. 1520)

The DeVany proposal defines TAS property rights such that the resolution of conflicts will minimize Coasean social costs. Because operator *F* has the right to transmit at 250 MHz without interference, either *D* or *E* must bear the costs of correcting the problem. The DeVany solution is to hold responsible whoever's transmitter has combined the two signals since this leads to the cheapest fix.

This calculation is entirely alien to Rothbardian property rights. As Chancellor Wilson concluded in the *Oak Leaves* case, "priority of time creates a superiority in right." The relevant question is: who was there first, and who was there last? If radio operator *F* is the newcomer, then he has to either bear the direct costs of overcoming the intermodulation or to make voluntary arrangements with *D* and *E* to transmit at his preferred frequency.

Auction: Rothbard versus Herzel

When, in 1951, Leo Herzel suggested that the FCC should auction broadcast licenses to the highest bidder, the immediate issue was which of two technologies should be used to transmit color television. CBS proposed one technology and RCA proposed another. Herzel realized that the answer was better found through the efficiencies of market processes than through the central planning of a regulatory body. Let the broadcasters bear the full costs of their technological choices.

There are, however, many problems with the auctioning of licenses, as we see in the case of mining on public lands. If a license gives a mining company exclusive access to certain metal deposits for the next five years, the incentive to the licensee is to extract as much metal as profitably possible within that five-year period. There is no incentive to conserve resources and no incentive to preserve the

mining site or to make capital investments past the five-year window. (This is better than the open-range scenario. It's not a full tragedy of the commons. But the situation has more in common with the commons than it does with private property.) As the license expiration date approaches, the incentive to extract grows larger and the incentive to preserve and invest approaches zero.

Both the optimal conservation of resources and the optimal development of capital structure result from the user of a resource owning the title to its long-term capital value (Rothbard Lecture 1970s).

To take an example more familiar to most of us: we'd expect a homeowner to take better care of his residence than we would a renter. Not only will the owner take greater care to preserve the structure now, but he'll also make investments toward the capital value (and thus resale value) of his property. The renter, in contrast, cares for his residence only within the boundaries of his own short-term comfort and his legal liability to the landlord.

If an auction is to promote market efficiency in a resource, the items auctioned should be full property titles, not licenses.

In 1998 Leo Herzel published "My 1951 Color Television Article" in the *Journal of Law and Economics*. In it, he qualifies his support for auctions:

> Arthur DeVany is exactly right when he says . . . about my color television article that I did not think auctions were all that important and that what mattered most to me was the package of rights and obligations that were auctioned. . . . As I have explained, I wanted to give FCC licensees the right to choose their own technology for the transmission of color television signals. I chose auctions as a simple, efficient way to achieve this property right. . . .
>
> Unfortunately, FCC license auctioning has been adopted for the wrong reason, to raise revenue for the government. My main concern in my color television article was to attain better allocations and uses of FCC licenses, which I still think is the right concern. Auctioning was a convenient means to this end. (Herzel 1998, p. 527)

But is an auction—even an auction of full property rights—an acceptable solution?

Rothbard writes:

> [W]hy does the government deserve to own the revenue from the sale of these assets? After all, one of the main reasons for desocialization is that the government does not deserve to own the productive assets of the country. But if it does not deserve to own the assets, why in the world does it deserve to own their monetary value? (Rothbard 1992, p. 75)

So how do we privatize the airwaves? If the spectrum confiscation were a recent development, the first answer might be to return the stolen property to its rightful owners or their heirs.[10] When Rothbard wrote about post-Communist desocialization in 1992, it was still possible to do that in Eastern Europe, but probably too late in Russia. With regard to broadcast properties, it is probably now too late in the United States as well, though the heirs of the earliest broadcasters should be given a chance to reclaim their airwaves.

A second option is to issue each citizen a marketable share in the newly privatized resource. Rothbard rejects this option for two reasons: (1) while the idea is simple, the logistical complexity of implementing it is huge, leaving plenty of room for abuse and the discrete preservation of political privilege; (2) he also finds this solution philosophically problematic:

> It would enshrine the principle of government handouts, and egalitarian handouts at that, to undeserving citizens. Thus would an unfortunate principle form the very base of a brand new system of libertarian property rights. (Rothbard 1992, p. 73)

Still, there is an appeal to Boris Yeltsin's defense of the (never fully implemented) egalitarian solution: "What we need is millions of property owners, not merely a handful of millionaires" (Observer 2003).

But Rothbard's solution is both philosophically consistent with the rest of his libertarian property theory and also has the appeal of creating a "people's capitalism" without resorting to egalitarian handouts. Government-seized resources are not legitimately owned. If there is no legitimate owner, then the would-be property is, philosophically speaking, *unowned*. And unowned property is available for homesteading. A complete, widespread, diverse privatization requires only that we treat government-held property as abandoned property. In the post-Soviet desocialization, this would have left the workers in charge of their factories, farms, offices, etc.

This may sound like the collective ownership espoused by early communists, but the similarity is in the language and not in the

[10]An anonymous referee of this journal comments: "I'm not sure this makes sense, once you've moved past the 'physical' property metaphor. If the station has been dismantled and the frequency given over to a completely different use, is it the 'same' spectrum?" In my view, the physical property metaphor is as wrong for land and buildings as it is for rivers, oceans, air, and radio spectrum; thus the restitution rights of a property owner's heirs must stand or fall on the same criteria across resources. By praxeological property theory, the current assignees of the portion of spectrum in question are the recipients of stolen goods. It is beyond the scope of this essay to explore what might be required to make the injured party "whole" again.

specifics of implementation. Since there is no rights-bearing collective entity, there can be no legitimate collective ownership, only a collection of individual owners. If a hundred workers become the homesteaders of a factory, then they each hold a 1 percent marketable share in the factory's property title. If similar arrangements hold for all the other farms and factories, etc., then the marketable shares quickly form the basis of a new stock market and a radical readjustment from a less efficient capital structure to one that optimizes the production of wealth.

What's the equivalent scenario under a desocialized spectrum? Current *de facto* users of frequencies become *de jure* owners of property titles to those frequencies. This is as true of unlicensed "pirate" broadcasters as it is of FCC-approved operations.

There is something unsatisfying in a revolution that leaves the same protectionist corporations in charge of their current broadcast channels, but keep three things in mind: (1) they would no longer enjoy the political privileges of the FCC's protection; (2) their competition will blossom into a diverse array of interests and market models—educational and commercial, for-profit and nonprofit, broadcast and point-to-point, etc.; (3) the consumers will finally be in charge. Any Big Broadcaster who survives the fallout will have earned the right to continue broadcasting. While post-governmental homesteading would produce results less just than initial-appropriation-based homesteading, undoing a century of history is not an option. Homesteading is the best of the strategies left to us.

Government Spectrum: Rothbard versus Everyone

How much of the spectrum should be privatized? All of it. Even the vast "beachfront property" held by the military? Yes, all of it.

As radical as this sounds, it was the position held half a century ago by both Herzel and Coase, although their vision of privatization was different from Rothbard's, and their preferred size for a surviving government was much larger. Recall that when the FCC's former chief economist said in disbelief, "Surely it is not seriously intended that [government agencies] should compete with dollar bids against broadcast users for channel allocations," Leo Herzel replied, "Such users compete for all other kinds of equipment or else they don't get it" (Coase 1959, pp. 15–16). Coase agreed that the most "socially" efficient use of spectrum could only result by requiring the various government agencies to bid against each other and against private bidders in an open auction. Coase doesn't mention the Austrians, but he must have been influenced by Mises and Hayek: without prices, there is no rational calculation. The military's outright appropriation

of so much spectrum caused massive waste and inefficiencies—with all the accompanying "social cost."

But the government doesn't bid with its own money. It uses the money taken from private interests (through direct taxation or the indirect tax of inflation) to bid against those same private interests for scarce resources. There are limits to how much the government can take without bringing the entire economy down, but those limits are nothing compared with the practical limits facing any individual private investor.

This is where Rothbard parts company with economic conservatives, classical liberals, and libertarian minarchists. So long as the state holds a territorial monopoly on force and involuntary taxation, no market can be truly unhampered, least of all markets in resources the state wants to acquire.

Requiring government agencies to bid for resources does not free the market, neither does it reduce Coasean social cost. Just to take a recent example, the government borrows, taxes and inflates to conduct wars abroad. Among the resources they need are lumber and other construction supplies. Private citizens are hurt by the military's acquisition of bidding funds, even before their bids on resources drive up the costs of new construction. Raising the price of new homes also raises the price of old homes, which also raises rents. Even if we ignore the economic destruction taking place outside American borders, military "competition" for resources causes harm within our borders.

One might argue that these effects are no different from any wealthy capitalist bidding up prices, but (1) the capitalist is more often driven by projects that he predicts will be profitable (and therefore economically beneficial), and (2) the capitalist got his investment funds through mutually beneficial past voluntary exchange. The military, in contrast, either seizes the resources it needs, or seizes the funds it needs to purchase them. The capitalist makes his bid in a positive-sum context; the government's game is zero-sum even before the auction takes place.

Requiring government agencies to bid for spectrum in open auction is only beneficial to the extent that it reduces the amount of spectrum held by the government. Whatever spectrum they continue to hold is paid for through seizure, which is not, economically speaking, significantly different from having seized that amount of spectrum outright.

But even without Rothbard's preferred abolition of the state, a homesteading principle, applied to all useable spectrum, would drastically reduce government waste. If the Navy wants to keep a

certain frequency range, then it has to use it. Neither direct nor indirect seizure is enough to claim it as property.

Most government-held spectrum is currently unused, but remains off-limits to private appropriation. The result, in the United States, is an artificial scarcity well beyond that imposed by the FCC's protectionist practices. In most of Europe, for instance, the Welfare State is bigger than in the United States, but the Warfare State is considerably smaller. As a result of less military appropriation, private European companies have more spectrum to work with for new radio technologies such as mobile telephony and wireless Internet. This puts American companies and consumers at a severe competitive disadvantage in a global market. In a more personal context, it means that my wireless Internet access is slower, less robust, and more expensive than it has to be. What seem like fast-paced changes in wireless and data technology are actually slower than they would be in an unhampered market in radio spectrum.

DAMAGE REDUX: OPPORTUNITY COSTS

> Where the competitive spur is weak, or especially non-existent (as in government), development will be slowed down. Furthermore, the existence of many firms, many centers of development, make it far more likely that new ideas will obtain a hearing and a trial somewhere.
>
> — Murray N. Rothbard 1959
> "Innovation and the State"

> It is beyond the abilities of economic analysis to calculate the opportunity cost of the socialist experiment.
>
> — Yuri Maltsev, 1996
> "Murray Rothbard as a Critic of Socialism"

The established advice in personal investment is to start early. Since capital growth is cumulative, your earliest investments, all else equal, will yield the largest rewards.

There's an important inverse to this rule when dealing with damage done in history. Eastern Europe had lived under Communism for a shorter time than Russia. Eastern Europe is recovering faster.

As Coase writes of the FCC, "The history of regulation in the broadcasting industry demonstrates the crucial importance of events in the early days of a new development in determining long-run governmental policy" (Coase 1959, p. 40).

Even if we could fully privatize the spectrum overnight, the damage done by decades of government intervention, both in the FCC's cartelizing and suppression of known technologies, and by the military's classification of secret technologies, is at this point incalculable. But we can look at dates and trends to at least begin to guess at the damage done.

Most people, both advocates and critics of free markets, associate capitalism with mass-market advertising and a homogenized "consumer culture." But these phenomena were not the result of any competitive market in private property titles; they were imposed on a hostile listenership by a tiny handful of politically privileged corporations who had successfully used regulatory capture to stamp out the competing diversity of voices and market models. Remember that the Chicago *Tribune's* WGN broadcast fully sponsored entertainment programming to promote the sales of its newspapers. Other broadcasters were looking into subscription models akin to premium cable TV channels. The airwaves were full of amateurs, nonprofits, and educational stations. The Big Broadcasters had them all run off the air.

What pre-regulatory radio resembled most is the modern Internet. Think of all the ways you've heard or imagined the Web could change how we get and use information and how it could alter the structure of commerce; then try to imagine that happening 80 years ago!

If you think the quality of cable channels has improved the quality of broadcast channels—or at least the diversity of our viewing options—imagine that trend starting in the 1940s or 1950s instead of the 1970s and 1980s. Imagine commercial-free subscription satellite radio and TV with thousands of content-specific audio and video channels, costing the subscriber the daily price of a cup of coffee. Now imagine that medium as decades old by now.

The Big Broadcasters warned that such diversity would be a burden on the consumer, because radio receivers would have to be smarter and more precise and therefore more expensive. But cost doesn't drive price; demand drives cost. Hundreds of millions of consumers will quickly bring down the price of any technology in a competitive market of manufacturers.

Pro-regulators and advocates of market intervention like to cite the Internet as an example of an infrastructure that required massive central funding and government planning—something the free market couldn't have produced. Austrians usually counter this claim with the following question: Why should we consider the actual historical timing of the Internet's emergence as the *optimal*

timing for such a technology? What is seen is the blessings of a global information age; what remains unseen is the opportunity costs of coercively diverting funds from voluntary exchange to military R&D.

But there is another important fallacy behind the Internet argument. Because things *did* develop in a certain way does not mean they *could only* have developed in that way. Did the Internet become a reality because of government intervention, or did it come about *despite* government intervention? When exploring counterfactuals, we're left to theory and conjecture, but radio history offers us strong evidence that government suppressed more technology than it promoted.

Wireless Internet technology is called Spread Spectrum because it sends multiple narrow signals across a wide band, or "spread" of radio frequencies. The technique is also called "frequency hopping" as a single message will move pseudo-randomly from frequency to frequency within the available band. The first patent for this technology was issued in 1941 to Hedy Lamarr, the Hollywood actress, and George Antheil, the avant-garde composer.[11] Lamarr and Antheil never saw a penny because the government classified the technology. By the time the technology was declassified, their patent had expired. Spread Spectrum was independently "reinvented" by government-funded scientists in the 1960s.

Frequency hopping, and radio encryption in general, is a short step away from digital radio. Digital radio is an even shorter step to widespread digital networks.[12]

Could we have had decentralized, nationwide digital networks decades earlier without government intervention into radio technology? We've already seen that the trajectory of radio content resembled the Internet before intervention; now we have at least the suspicion that the underlying technology could have developed toward a similar infrastructure. You can't dismiss the idea as mere counterfactual guesswork without recognizing that the government-was-necessary-for-the-Internet thesis is also counterfactual guesswork.

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[11]Why and how an actress and a musician managed to invent an important new technology is a fascinating story, but it's too long to repeat here; but those who are interested can read further at http://www.sss-mag.com/shistory.html.

[12]Public key cryptography, the basis of secure transactions online, was developed in secret under British intelligence a decade before American academics independently produced what is essentially the same scheme, and three decades before the private sector adopted it for use online. An alternate history of free-market, public-key cryptography is left as an exercise for the reader.

We can't know what the opportunity costs have been from eighty years of regulatory central planning, but we can know that the cost has been profound.

BAD ECONOMICS REDUX: THE MYTH OF POST-SCARCITY

> Bad and discredited ideas, it seems, never die. Neither do they fade away. Instead, they keep turning up, like bad pennies or Godzilla in the old Japanese movies.
>
> — Murray N. Rothbard 1995
> *Making Economic Sense*

Ironically, Spread Spectrum technology has brought about a new challenge to privatizing the ether. The idea is called "Open Spectrum" and its advocates claim that it can create a commons without tragedy.

WiFi, a commercial technology used for local wireless networking, is one application of frequency hopping. A transmitter sends a variable-length data packet per hop, finding its way around unavailable frequencies. This allows for the spontaneous coordination of multiple signals from multiple sources, strangers working cooperatively within the same spread of spectrum.

Like Frequency Modulation, Spread Spectrum is an innovation that expands the economic supply of radio spectrum. Such innovations make the resource less scarce, but there are Spread Spectrum advocates who claim that the technology "will make the notion of electromagnetic-spectrum scarcity . . . seem quaint" (Stirland 2002).

With universal standards centrally controlled, they say, all radio spectrum can become *real* public property. No one need take channels out of the commons. The standards will keep us polite and cooperative in the post-scarcity of a universal broadband wireless network: "In an ideal world, the FCC would treat the airwaves like a highway system nobody owns and enforce rules governing how people use its lanes without crashing into each other" (Ibid.).

To anyone who has ever been stuck in traffic, it is strange indeed to see government roads cited as the paradigm of post-scarcity.

There are, in fact, two very different approaches to creating a radio commons: (1) *unlicensed spectrum*, which is entirely dependent on central regulation and the abolition of exclusive use, and (2) an approach called *underlay*, which coexists with exclusive use and is compatible with a Rothbardian understanding of private property rights.

Unlicensed spectrum is what we currently use for WiFi and other nonproprietary forms of wireless Internet access. The FCC set aside a

"junk band" of high frequency spectrum for use in unlicensed devices. This not only includes the new WiFi devices, but microwave ovens and other appliances that cause radio interference. (Thus the designation as "junk".) Cordless phones, baby monitors, and wireless stereo speakers also operate in an unlicensed band. Full Open Spectrum advocates want to turn the entire range of spectrum into something akin to WiFi. More modest proposals suggest that the FCC divide the spectrum into half open commons and half private licensed—not *fee simple* property, but something similar to the fallback position of the DeVany proposal where licenses are long-term and saleable, but the state doesn't need to go through eminent domain proceedings to reclaim them from private owners. (This built-in regulatory seizure option is called "flexibility" of property rights.)

What both full-commons and half-commons proposals depend on is an honest and apolitical central regulatory body to police the spectrum. Austrian theory, Public Choice theory, and ordinary common sense are dubious that such a body could last, if it could even exist in the first place.

But there are more basic economic problems with the Open Spectrum proposals. The tragedy of the commons does not go away just because radio spectrum is "inherently nonphysical." Spectrum scarcity is caused by interference. This is the one fact that everyone agrees on. But Open Spectrum advocates claim that technology can overcome interference and therefore eliminate spectrum scarcity. There will still be scarcity in the radio technology itself, of course, but that's where Open Spectrum proponents say the market belongs. They even claim that Open Spectrum is *more* market-based than spectrum property models: "the full realization of Open Spectrum" would move us "away from heavy-handed regulation towards a free-market environment in which innovation and service quality matter more than government-granted privileges" (Werbach 2002).

But does smarter technology actually banish scarcity? According to Thomas Hazlett, it does not: "'Physical abundance' trips over Say's Law, updated to the Information Age: Spectrum creates its own demand" (Hazlett 2001, p. 424).[13]

[13]Say's Law—"Supply creates its own demand"—is dismissed as fallacious in mainstream economics. But Austrians understand Say to have meant something quite different: Supply of X represents demand for goods that are not X. The reason a person produces apples, or labor, or widgets, is because he wants to sell these goods in order to buy other goods. Thus the supply of marketable goods creates the practical demand for other marketable goods.

In the world of computers, content will expand to fill whatever storage and bandwidth are available. When I can send or receive only small documents at low marginal cost, I will wish I could more easily download whole books. Once book downloads are fast, I will want to download libraries. When text libraries are easy, I will want the data content of DVDs, then film libraries, then teleportation. There is no limit to our potential wants, when cost is perceived to be zero.

The advocates' answer is that rational pricing and allocation will take place not in spectrum property but in technological property—the costs of the wireless devices themselves, which will have to get smarter and smarter to see past what older device users will perceive as massive interference.

Our metaphors guide our intuition, and one important point that the Open Spectrum advocates stress is that our physical metaphors for radio spectrum can lead us astray. But it's hard not to see an analogy between the increasingly crowded spectrum and an increasingly polluted atmosphere. Are we really content to count on a robust market in ever-more-efficient air filtering technology?

Abandoning the metaphors, we can still look to one inconvenient fact for the Open Spectrum argument. As more and more devices crowd the commons, there are diminishing returns on investment in technology. That doesn't imply a ceiling on potential innovation, but it does imply that spectrum abundance would be temporary at best. What's our Plan B when scarcity refuses to be abolished?

As economist David Friedman (2003) commented at the Stanford Law School's conference on spectrum policy, we all know how to create commons in a private property regime—but how do we move from public commons back to private property?[14]

The second approach to Open Spectrum is both more promising and less ominous. Not only is underlay technology compatible with Rothbardian property theory, but also the rules of underlay fit Rothbard's model *better* than they fit mainstream property models. With underlay technology, wireless devices can send and receive on *any* unused frequency, so long as they don't interfere with the transmission rights of exclusive licensees—or actual property owners in a privatized spectrum.

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[14]David Friedman is a Coasean economist, not Rothbardian. Unlike most Coaseans, however, he sees "social cost" as inevitably increased by the state. He is the best-known anarcho-capitalist economist outside the Austrian School tradition.

The technologies behind underlay are *ultrawideband* (UWB) and *agile radio*. UWB allows communication at local energy levels below interference thresholds, while agile radios coordinate their frequency hopping such that both sender and receiver treat frequency that's already in use (or about to be used) as off-limits.

> In this regime, individuals and corporations would be able to buy, sell and lease specific frequencies in specific locations subject to power (and other technical) limitations, and would possess the right to emit any time *without interference*. Other emitters could use this spectrum, but only on condition that they not *meaningfully* interfere with the owner's right to clear broadcast. Thus, UWB emitters that maintained power levels below the noise threshold would be non-interferers. Agile radio emitters that vacated a frequency within (say) one microsecond after the frequency owner began broadcasting would be non-interferers. Conversely, either a UWB emitter exceeding its power ceiling or an agile radio emitter taking too long to vacate is an interfering user and becomes subject to penalties. (Faulhaber and Farber 2003, p. 14)[15]

Physical metaphors lead some to describe underlay as "the FCC [allowing] people to drive across other people's 'property' as long as they keep a low profile and don't do any damage" (Stirland 2002). Others describe underlay as legally sanctioned "non-interference easements" where the so-called easement is held by the public at large (Faulhaber and Farber 2003, p. 14).

But notice that both describe underlay as *allowable trespass* onto someone's property. This sort of oxymoron is necessary in a worldview of conflicting rights, and leads to the kinds of legal judgments that gave English factories permission to pollute English farmland for the greater good of England, or the Uniform State Law for Aeronautics in the United States, which claimed to recognize the *ad coelum* property rights of common law, while acknowledging "a superior public privilege to invade the right" (Rothbard 1982, p. 85).

Rothbardian property theory and Austro-libertarianism in general do not see "rights" that are inherently in conflict as being actual rights in the first place. All natural rights are equal and compatible, though interests will come into conflict. Thus Rothbardian property does not require mandatory easements or legal trespass. Remember that legitimate property, whether acquired through homesteading or voluntary exchange, is an exclusive claim to the *relevant technological unit*—that being however much of something is necessary to its

[15]Faulhaber was chief economist of the FCC from 2000–2001, and Farber was chief technologist of the FCC during those same two years.

productive use. The use of underlay technology is less like driving across my yard and more like flying over my house or drilling oil reserves that extend beneath my land. It is not that noninterference makes trespass permissible: without damage to the technological unit, no trespass has taken place at all.

And when interference—and thus trespass—does take place, the result is property damage, a tort to be pursued through civil courts or arbitration, not something requiring the involvement of any central regulatory body.

So if underlay provides the benefits of Open Spectrum without violating or abolishing private exclusive claims to the use of certain high-powered signals, why does the debate continue? *Cui bono*? Who benefits from the proposed vision of a vast public commons?

As with the original nationalization of the airwaves, Big Government is the most obvious beneficiary. We can expect the FCC to seek new paradigms for its continued existence, just as U.S. military interests did during what were, for them, those nervous years after the sudden collapse of the Cold War.[16] We should also expect the modern military to approve any policy regime that might divert attention from the spectrum they keep outside public use.

What about Big Business? Here we see a change from 80 years ago. The corporations are divided, their markets more diverse. Some large players—mobile phone companies, cellular modem services, and traditional broadcasters—see their brightest future in exclusive licensing (if not *fee simple* ownership). It's the technology providers who are most enthusiastic about an Open Spectrum regime that would move all financial competition out of radio spectrum and into hardware and software. By definition, all market demand moves to wireless devices when that's the only place market supply is permitted.

What is entirely different from the first nationalization of spectrum is the role of the technical specialists. Early radio experts—the "amateurs"—were wary of a government takeover that they knew would threaten their use of the medium. But now the most vocal supporters of a government regulated commons are engineers and other technologists, who see private ownership as the biggest threat

[16]It's interesting to note, however, that so many regulation skeptics have served their time within the FCC. Individuals might try to reform the system from the inside, but the system itself remains resistant to reform, which is why these former bureaucrats are now so skeptical. Review the list of property advocates at the Stanford Law School conference in 2003.

to freedom and democracy, while believing that a well-defined, benign role for government can promote common welfare in a high-tech future. (This benign role, however, has yet to be well defined.)

To find historical precedent for the engineers' advocacy, we need to look not to the radio debates of the 1920s, but to a different ideological battle taking place in the same decade: the debate over the viability of socialism. To listen to brilliant, earnest engineers—people who no doubt believe in their idea of freedom and the common good—advocate what is essentially radio communism is to have a window into history. It's easy for some of us to dismiss the early socialists as either criminally cynical or criminally naïve—how could they not see what was coming? But if you listen to the Open Spectrum advocates for a while, it's easier to see how so many could have been drawn into a vision of a world without scarcity . . . once the chains of private property have been cast off.

What Ludwig von Mises contributed to the old debate was the problem of economic calculation in the absence of private property. What Rothbard contributes to this new debate is both Mises's calculation problem applied to the American regulatory state, and a theory of private property that is both efficient and ethical.

CONCLUSION

> In the long run, economics triumphs over symbolism, hoopla, and radical chic.
>
> — Murray N. Rothbard 1995
> *Making Economic Sense*

Yes, radio spectrum is unique. So is every other resource unique. Thus the technological units of any resource will have to be uniquely determined, but scarce resources cannot be handled with efficiency or justice outside a private property regime. When a resource is "public" it will either suffer the tragedy of the commons or be subjected to political allocation on the part of privileged interests, with all the waste and calculational chaos inevitable under central planning.

While it is true that the history of land property lends itself to misleading metaphors and false understandings of the nature of new resources, the *Oak Leaves* decision of 1926 illustrates that common-law precedent can guide us to correct answers if we understand which metaphors are useful and which ones don't apply.

Murray Rothbard's praxeological property theory makes common law more coherent—not just for new resources, but for all scarce

resources, including land, labor, and capital—and obviates our dependency on metaphor. While classical (and neoclassical) property models struggle to adjust to new conditions, the *relevant technological unit* serves as a principle for judging any new resource—or new understanding of an old resource. Property is not in things, but in our use of things, in our actions taken in the world. Once we return to the fundamentals of human action, we find that new circumstances are best addressed with old principles.

Wireless technology will continue to change the nature of communication and our uses of information. It will no doubt effect radical changes in the particulars of the market, but it cannot make economic law obsolete. Neither can it change the ethics of property rights.

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