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DOWN TO EARTH

SATELLITE TECHNOLOGIES, INDUSTRIES, AND CULTURES

EDITED BY

LISA PARKS AND JAMES SCHWOCH

RUTGERS UNIVERSITY PRESS

New Brunswick, New Jersey, and London



THE INVENTION OF AIR SPACE, OUTER SPACE, AND CYBERSPACE

JAMES HAY

This chapter offers a genealogy of three related discourses and programs about achieving, enacting, and managing communicative space: *air space*, *outer space*, and *cyberspace*. I first consider how something called “outer space” (a space of freedoms, an object of government and policy, and a space “settled,” understood, and organized through a new regime of technologies fit for global communication) developed out of a pre–World War II conception of *air space* (having to do with both radio and flyover space, and hence a conception of space supporting and problematizing national sovereignty). I then suggest ways that these two historical conceptions of space and regimes of communicative space (*air-space* before World War II, and *outer space* during the Cold War) became a framework for imagining, requiring, and inventing something called “cyberspace.”

In this chapter, I emphasize the ongoing problematization and regulation of extraterrestrial outer spaces since the late nineteenth century in order to suggest a historical connection between the reinvention of outer space and political modernization (the reinvention of liberal government). In this sense, I offer a way of thinking about the relation between the invention of communication, the invention of space (that solves or manages problems of communication), and the ongoing experiments aimed at “advancing” and reinventing liberal government as a system invoking the virtue of communication as the most peaceful and civil way to exercise freedom and achieve security. While I focus on how this reinvention of communication, space, and government occurred in the West (and particularly from the United States), I also underscore how these ongoing programs of invention were rationalized as solving problems of global governance and of waging global peace through

extraterrestrial communication. Furthermore, while I am interested in the practice and mentalities of invention, I also emphasize the experimentalism, failures, and insecurities surrounding the solutions for managing space, and in this way underscore the changing *regimes of truth* in governing and securing a “free world” and open skies, through communication technology.

This chapter makes a number of contributions to the discussion of satellite technologies of communication. First, it offers a history of the present, considering how the current (“neoliberal”) governmental rationale about securing cyberspace has emerged out of a modern preoccupation with securing, regulating, and pacifying air space and outer space. Second, it addresses how understanding satellite technology depends on recognizing the historical and geographic relationship between communication and transportation technologies. Third, it rebuts technological determinist accounts of contemporary communication technology by emphasizing instead how the invention of communicative space has been predicated on the changing rationalities of liberal government—particularly from the United States. And fourth, it offers a theoretical and methodological alternative to accounts of modernity and globalization that see space as an epiphenomenon of communication networks, economies, and political government, and their modernity or modernization.

Modernity's Babel Complex

It is by nature that one of the uses that God has given to the seas and rivers is that of opening up routes that communicate with every country in the world by navigation. And it is by police that we have made towns, public squares, and other places appropriate for this use, and that those of each town, province, and nation can communicate with all the others of every country by great highways.

—Jean Domat, *Le droit public*

Although this chapter is mostly concerned with developments over the twentieth and twenty-first centuries, it recognizes the importance of an even longer history of communication, space, and government. Noteworthy research into this historical context includes James W. Carey's discussion of the relation between communication and transportation during the nineteenth century and how that relation temporally and spatially organized emerging nation-states such as the United States, and Armand Mattelart's explanation of “the invention of communication” as a swarming of scientific discourses and projects in eighteenth-century France preoccupied with the “health” of circulatory systems—from the human body to national territory—as unblocked, freely flowing arteries. Carey and Mattelart both call attention to the interdependence of communication and transportation, though Mattelart more fully acknowledges the relation between economic modernity

(*laissez-faire*) and modern communication as transportation (*laissez-passer*), and between liberalism and the various “paths of reason” (the rationalities, technologies, and networks) on which communication's “invention” and modern application depended.¹

The chapter's title refers to Mattelart's history of the invention of communication, but also examines the intersection between his history and Michel Foucault's writing about the emergence of liberalism (political modernity) through technologies of security and government. For Foucault, the birth of liberalism occurred through technologies of freedom that also operated as technologies of government. Whereas Mattelart points to the eighteenth-century French physiocrats in order to explain the “paths of reason” (the sciences of circulatory systems) that collectively represented communication as a relation between *laissez-faire* and *laissez-passer*, Foucault refers to physiocracy in order to consider how modern political economy developed as one of many “rationalities” and technologies of modern, liberal government.² Foucault's well-known studies of disciplinary power and a “security society” frequently examined the historical rationalization (separation and organization) of spaces such as asylums, hospitals, and prisons, but in his later career he occasionally discussed liberal government's emergence through a new regime of spatial technologies and rationalities designed to solve problems in managing distance and mobility.

Foucault's explanation of the relation between liberal government and modern “technics of space” is worth elaborating briefly to clarify some of the basic objectives of this chapter. He suggested that liberal government developed during a period when the old European conception of *police* or “police state”—whose model was the internal organization, communication, and monitoring of a town or polis—was giving way to the problem of governing territory.³ Territorial government may have developed using the city as a residual model of government, that is, the “urbanization of territory” whereby streets radiating from a city center became analogous to networks of transport and communication radiating from state capitals. However, networks of transport, communication, and electrical grids (*technics of space*) increasingly solved the territorial problem of liberal government by becoming the practical rationalities for an extensive space and the space of the frontier. Second, these technics of space were indispensable to the emerging technics of liberal government because their modality and field of operation (territory, communication, and speed) were supposed to liberate—or rather, govern and secure—through the freedom of mobility and extensive space, through the maximization of *laissez-passer*. To *police* is to urbanize the practice and conception of government as an internal organization; to govern through freedom involved a new relation of space and power, specifically a recognition of the technologies for organizing and managing the extensiveness of

territoriality. Alongside Mattelart's account of the invention of communication, Foucault's account helps explain how the birth of modern communication developed as and through technologies of government—as both *free-flowing* and *well-regulated* circulatory systems (the refinement of road, bridge, and canal networks), which became integral to liberalism's technologies for making rational/scientific the means of achieving “fair-government” and of continually overseeing “better,” more effective ways for populations—as free, independent, and mobile citizens—to govern themselves.

Foucault's account of liberalism's formation around these technics of (extensive) space does not address two implications of his thesis that are central to this chapter: how the technics of space enabled and complicated the *security* of territorial borders (the sovereignty and limits of territoriality) while simultaneously enabling and complicating the *extension* of territorial borders beyond or across the borders of nation-states, often through colonialist projects launched by the Western bastions of liberal government. As Andrew Barry has pointed out, the nineteenth-century space of liberal rule that was made possible by the growth of networks of communication (such as telegraphy), transportation (such as railroads), and electrical grids, became instrumental to the security of borders and frontiers.⁴ Governing the border tested the practical capability of coordinating communication and the rapid transport of people and supplies to and from borders, over increasingly vast distances. However, it also tested the limits of governing the extensiveness of communication and transportation networks—limits that called forth a new regime of transnational government.

Implicit (but never elaborated on) in Barry's or Foucault's explanation is how the freedoms ascribed to or supported by communication and transportation networks included the *transnationalization* of these networks. Although the transnational extension of communication and transportation networks during the nineteenth century produced a space of international circulation, the freedoms of transnational space posed particular problems and contradictions for liberal government. For instance, the freedom of movement and communication through extensive space made the border an object of securitization even as the border needed to be designed for efficient movement and communication through it with customs offices, passports, and so on.⁵ In this sense, the nation-state was only one scale of liberal government as extensive space and territory. Technics of national space, alongside the push for a *unified* international space of circulation, rapidly required ancillary governmental institutions oriented specifically toward the transnational space of communication and transportation—an internationalization of liberal governmentality in which the nation-states most committed to liberal government were most invested. As Mattelart has noted (echoing Carey's points about telegraphy and the westward spread of religions in the United

States), these international networks of communication and transportation were both material and spiritual, rationalized by French philosopher Claude-Henri de Saint-Simon as the technical means of universal and association and brotherhood. The institutions that emerged to oversee international networks thus were preoccupied as much with assuring free movement across national borders as they were with a policing role—assuring the peacefulness and harmoniousness among nations dependent through the maintenance of the healthy, rational growth of the networks of universalization. From the 1850s through the 1910s, the number of interstate agreements and institutions establishing standards for transnational communication and transportation grew dramatically in Europe—there were 17 of these between 1850 and 1870, 20 between 1870 and 1880, 31 between 1880 and 1890, 61 between 1890 and 1900, and 108 between 1900 and 1910.⁶ These institutions comprised an emergent regime of global governmentality, peace, and cooperation, one whose primary preoccupations were the health, stability, and normalization of international movements through communication and transportation networks.

Given that the modern governmental problem that Foucault identifies as territorial space was addressed in the second half of the nineteenth century through the proliferation and interdependencies of communication and transportation networks, these networks generally were able to connect populations and administrative agencies for whom communication was a *national* objective—a relation to the earth/territory (*terra/territorium*), as the location of birth and growth (*natio*). Not only did the speed and extensions of communication and transportation complicate this relation to *terra, territorium*, and *natio*, they required or called forth technologies for regulating both the breakdowns of peaceful coexistence/communication and of the freedoms of communication and exchange beyond national borders. The growth of international agencies of government and security targeted nothing short of the increasing potential for communication breakdown. They were both haunted by the specter of what could not be contained and the need to “advance” the apparatuses of global government—apparatuses that extended beyond native Earth and national territory and that “modernized” the Babel Complex.

The Freedom of the Air and the Law of the Air

The relation of freedom, government, and security that Foucault attributed to the nineteenth-century technics of space was decidedly *terrestrial*—their space of rule a *territorium*, the land surrounding a town or city. For Foucault, these technics of space, particularly by the late nineteenth century, became integral to a changing rationality of government that projected the town or city model of government—a model of streets radiating from a

town's center—onto a more extensive, national space. Thus the old model of government became a template for grids of transport, electrical power, and communication radiating from capitals. In this sense, liberalism's rationality about the government of territory remained moored to the land example (the political territory as terrestrial) as much as it was committed to inventing technologies for overcoming distance and the terrestrial impediments that stood in the way of *laissez-passer*.

Until the twentieth century, the modern "Babel Complex" (the discord produced by the technology designed to extend communication transnationally) had not quite included the invention of extraterrestrial or air space as a problem or object of liberal government. Certainly there were scientific towers, such as Paris's Eiffel Tower, which Roland Barthes has described as born into a modern Babel Complex: if the Tower of Babel was a theological project used for communicating with God, the Eiffel Tower was a modern ascensional dream "almost immediately disengaged from the scientific considerations which had authorized its birth."⁷ But as I intend to show in this section, even those towers became instrumental to the networks supporting a new rationality of liberal government preoccupied with, and acting on, air space.

Arguably the most challenging objective of emergent international government, and one of the most nettlesome challenges to the sovereignty of nation-states at the turn of the twentieth century, was the government of air space. In the first decade of the twentieth century, a rapidly intensifying preoccupation with air space led several key international (Western) conventions, committees, and treaties to formalize the first regime of air law. Through these legislative initiatives, the air or air space became a focal point of discourses about freedom and government, freedom of passage and sovereignty, aircraft and statecraft. If the "air," "heavens," or "ether" were premodern, "air space" was an object of rational, scientific calculation and governmental standardization, regulation, and policy.⁸ To be free and open, the air needed to become air space that made rational its "fair" use. The nation-states most concerned about regulating the freedoms of air space were those most invested in the technologies of flight. They were also the bastions of liberal government.

Even though the rapid proliferation of meetings, pacts, and legislation about air space at the beginning of the twentieth century represented a formal and methodical consideration of air space, they often argued that the air (even in the "remotest" bastions and colonies of Western, liberal government) could not be rationally organized and managed, in part because the government of the earth/land provided little scientific or juridical precedent or certainty. Edouard Rollin, a representative at the 1906 meeting of the Institute of International Law in Ghent, argued that it was premature to formulate

rules for the sky—a space that was as unknown and uncharted as the center of the African continent had been for Europeans fifty years earlier.⁹ In 1911, British legal scholar Harold Hazeltine attributed the dangers of air space to the lack of "a firm basis in analogy," noting that whereas creating a buffer zone between national borders and international waters may have diminished the potential of surveillance or hostile threats, the increasing distance of aircraft above sovereign territory actually exacerbated the fear and threat of surveillance and/or hostile actions.¹⁰

Those regulating the skies above nation-states looked initially to maritime law, but the law of the air introduced a new problem: defining the vertical limits of sovereignty. From the earliest legal statements about air space as a space of freedoms and rules, the problem of calculating and standardizing the vertical limits of national and territorial sovereignty was grounded in laws concerning the protection of "private property" or privacy. The first seminal essay on air space in the twentieth century, M. Paul Fauchille's splendidly titled "Aerial Domain/Dominion/Property and the Juridical Regime of Aero-States," alluded to the violation or threat to private (terrestrial) property posed by balloons and aircraft.¹¹ Nascent in these discussions about the rights and security of property owners was another serious question: what constituted ethereal property? If air space could be owned and legislated using maritime law or the laws regarding land rights (that is, landowners could do anything above their property that they wanted), then deciding how to measure and standardize the vertical limits of sovereignty became crucial. There were various proposed solutions: ethereal property or sovereignty was "as high as humans can reach," presumably through technologies of transport; or, ethereal property should follow the topographic rise and fall of Earth, with a set height agreed upon by nation-states. Some argued that the Eiffel Tower should be designated as a basis for universal measurement. But terrestrial rights and laws were difficult to fix in the air: how close to a building or domicile would the pilot of a balloon or plane have to fly to commit an act of peeping, and thus of criminal trespass? Just before World War I, Hazeltine's *The Law of the Air* represented one solution: that the air is free unless air conduct threatens or infringes upon the rights, sovereignty, or security of private and public land owners.¹²

These writings, pacts, and programs about air space resulted in two related schools of thought: one, that air space was completely free ("free air"), and the other, that international formulas needed to be instituted to protect national sovereignty and private property. In "air space," the freedom of air was predicated on law and limits. Establishing a governmental formula for the vertical limits of sovereignty thus linked the "free air" and the freedoms exercised in the air as not only a matter of rules but of borders. Particularly in the West, air law and sovereignty (the exclusivity of territory marked by

borders and the appropriate security apparatuses such as customs agents) thus involved applying an earlier reasoning about liberalism's space of rule, even as air space presented a new set of problems that called forth a new regime of governmental technologies. The sky, or more technically "air space," became a laboratory for testing the rules and limits of freedom necessary for national sovereignty and universal association. In this sense, air space became a medium for governing through peace and civility. Air space was a stage for international codes of conduct.

The invention of air space and the efforts to legislate the vertical limits of sovereignty were not simply about flyover space; they also pertained to the air space of radio signals and the growing synergy between technologies of transportation and communication that made air travel knowable, rational, safe, and governable. In that the birth or invention of air space involved recognizing limits (rules and borders) for the free and peaceful use of aircraft, these limits were supposed to make air space a space of *international communication* (in the sense propounded by Saint-Simon). In practice, the prospect of long-distance, precisely guided plane travel involved synergizing the technologies of air transportation and radio communication, "freeing" communication from the terrestrial technics and networks of space, and rationalizing air space for air travel and communication. By the 1920s, making the freedom of the air civil (that is, subject to civil codes and the rules of early international agreement) involved communication technology in very direct ways, because air vehicles (like ships) navigated with wireless forms of telegraphy and radio. Air travel and radio thus developed through one another by the 1920s. Their development in the first two decades of the twentieth century hastened various treaties and regulations pertaining to the freedom of radio- and flyover-air space, particularly in international air space. For instance, in 1908 an international agreement regarding the use of wireless telegraphy among ships and with land-based receivers became a template for the first rules regarding wireless radio in and from the skies—a pact administered by the fledgling International Office of Wireless Telegraphy and affecting twenty-seven countries, including the United States. By 1913, the year after the sinking of the *Titanic*, radio (or "wireless telegraphy") became a standard practice in Western shipping.

Radio communications both facilitated and problematized the government of a unified space of transnational circulation. By the early 1920s, radio operated through air space as part of the navigation of land and sea transport and also of aviation. Throughout the 1920s, as radio communications became integral to everyday life, they refined prior terrestrial communications' maintenance of a unified national space. However, during the 1920s and 1930s, in organizing nation-states as audiences and publics and linking nations with their colonies, radio communication also developed as a technology of

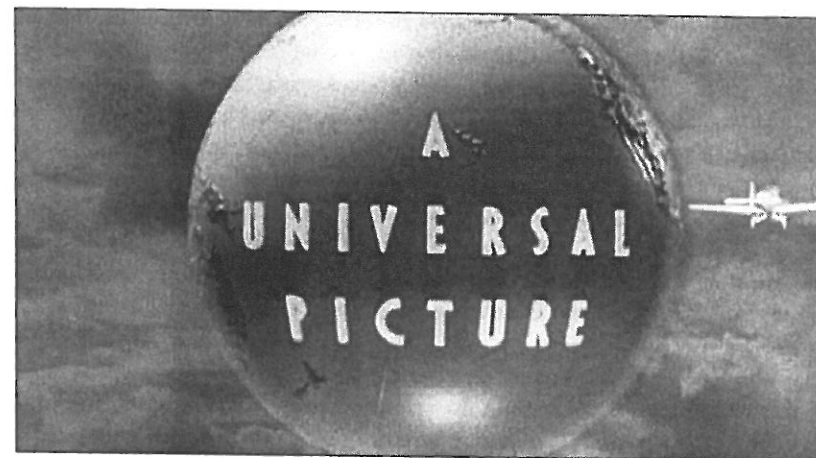


Figure 1.1 Universal Pictures' 1930s logo—a rotating globe circumnavigated by a tiny airplane.



Figure 1.2 RKO's image of an enormous radio tower telegraphing sound waves around the globe.

exporting (propagating and propagandizing) national cultures. And during wartime, radio served as a secretive and invisible way of gathering and conveying information from beyond national borders—making the foreign knowable, and thereby securing the homeland.

Some of the most well recognized iconography of the intersection between air space and Hollywood's emergent capitalization of global markets were RKO Pictures' branding of its films during the 1930s. RKO's image of an enormous radio tower telegraphing sound waves around the globe, like Universal Pictures' 1930s logo—a rotating globe circumnavigated by a tiny airplane—remain iconic to the present day (see Figure 1.1). The RKO logo in particular illustrated how profoundly the transformation of the radio towers (or the attachment of radio transmitting technology to skyscrapers) had stitched the nineteenth-century Babel Complex into a new, spatially "advanced" or extensive, rationality of air space and its liberal government (see Figure 1.2). The world as metropolis—as a new model of the city as a space of international

communications and liberal government—had become (to use the title of RCA's new complex in New York City) a "radio city."¹³

Air space thus developed as a virtual/ideal space of absolute freedoms, against which and through which liberalism (as a governmental rationality) was constituted and "advanced" historically and geographically. Air space became one of the new frontiers or problems against which and through which the rules and sovereignty of free peoples and states could be calculated. Because the right to the air needed to be measured to be governed fairly and rationally, the project of such governance was as much about guaranteeing the security of borders and property as it was about the freedoms of public and private air transport to act in the skies above and across terrestrial borders. The early codes, programs, and institutions for assuring the civility of freedom in the air and the security and defense of public and private terrestrial sovereignty continued through the 1930s, as evidenced by the League of Nations' unsuccessful 1936 effort to mobilize international support for a "radiophonic nonaggression" pact.

The international government of the air (rationalizing, civilizing, and pacifying the air as "air space") recognized the growing potential of air space as a threat to territorial sovereignty and as a new stage for warfare; controlling air space thus became both the objective and the means of waging peace and war. The origins of an "air force" (the exercise of power through and from air space) are not simply the outcome of military history and the inventions of technologies for combat but also of the technologies of international government oriented to both the freedom and pacification of the air in the late nineteenth and early twentieth centuries. The strategies of warfare in World War I and devastatingly in World War II not only developed through the communication and transportation technologies of controlling air space but also through the prior contradictions of exercising power through air space that was both "free" and "shared." Freeing and securing air space—governing through air space—became a reason for war, while the freedom of the air ("air power") became a new medium of military force. But controlling the air also became a stage for demonstrating the "finality" of war, or rather the continuation of war by other means. In the aftermath of World War II, the invention of a space beyond air space and the vertical limits of sovereignty (that is, inventing an "outer space") became the objective for governing the world through peace and communication.

The Invention of Outer Space—Governing the World through Communication and Peace

In his foreword to Andrew Haley's *Space Law and Government*, then vice president Lyndon Johnson noted that "the great new problems confronting civilization in the Age of Space require . . . that the principles of justice and order

should be established in these early days of man's exploration of space."¹⁴ More than rhetorical flourish, Johnson's emphasis on justice and order in outer space echoed the reasoning he had expressed since the late 1950s regarding the role of government in outer space. Johnson was one of the most outspoken supporters of bringing the space program under the *sponsorship*, rather than the direct control, of the federal government; this was partly a political tactic for rethinking the exclusively military and mostly clandestine early astronautical research, development, and exercises conducted during the Eisenhower administration. From the late 1950s, Johnson repeatedly justified the national space program as a means of establishing justice and order in and through outer space, of arranging outer space into a rational, liberal-democratic, and ethical sphere—as a "peaceful" endeavor rather than an exclusively or primarily military one.

Although one objective of accelerating and expanding a national space program was the imagined strategic military and geopolitical advantages doing so would provide the United States over Russia, the U.S. space program was not simply an epiphenomenon of the Cold War. The new world order that historians often associated with the Cold War had to do with an emerging way of understanding and governing space through many of the devices and technologies developed through the massive U.S. space program. The invention of outer space and its relation to the reinvention of liberal government following World War II developed through discourses and programs concerning the freedom and law of the air that had preoccupied Western nation-states and their early international agreements regarding transnational communication and transport since the nineteenth century.

In the first half of the twentieth century, the rules and sovereignty of free peoples were measured through and against the new frontier of air space, but there was a qualitative difference between regulating air space and outer space. "Outer space" became a new historical, geographic, and theatrical stage for shaping a discourse about rights and responsibilities, war and peace, security and risk—and thus for redefining the objectives of government and of national sovereignty on a global scale. Furthermore, as a new degree of space, a new state of freedoms, and a new object of government regulation, outer space became articulated to the political idea of a New Frontier. After World War II, and particularly by the late 1950s as astronautical launches became frequent, regulating *extraterrestrial* space became a key issue in rethinking government of and by nation-states. When Sputnik I began to orbit Earth in 1957, its legal status was unclear: what national laws did it violate, and if it violated no national laws, what international body governed its activity?

The seemingly unlimited, open, and unregulated nature of "outer space" during the 1950s revolutionized the reasoning about the security and

insecurity of nation-states. This was particularly true of the United States and Russia, both of which viewed outer space as a zone for securing the nation against unfriendly overflight. At a time when outer space was still relatively unregulated, it posed new possibilities for expanding the limits of national sovereignty (in space and into the future) and for establishing a proprietary relation over bodies in outer space, while simultaneously posing new risks and requiring new knowledge and technology for managing these risks. The 1955 Open Skies Treaty (proposed by the United States and rejected by Russia) was an example of the mentality about liberalization and risk-management accompanying the space program. The pact proposed that flights by unarmed surveillance airplanes be permitted over participating nation-states and reasoned that overflights were necessary for promoting confidence, predictability, stability, and peace—a new international, geopolitical order exercised from above.

Making space knowable and manageable/controllable came to rely on the new relationship between outer-space transport and outer-space communication. Although radio became a widespread instrument for navigation and communication during the 1920s and 1930s in aerospace transport (as well as in ships and cars), radio and televisual instruments became indispensable to astronomical flight—integral to tracking, guidance, and information recovery via astronomical craft. In the late 1950s, Sputnik I (1957) and Vanguard I (1958), the first Russian and U.S. satellites, respectively, were designed to test and demonstrate the feasibility of radio transmission to and from outer space. And by 1962, the first U.S. attempt to land an unmanned craft on the moon relied on radio operations for most of its primary procedures: communicating and telemetering on the ground before and during launches; tracking, command, guidance, navigation, and telemetry during the flight; telemetry and televisual scanning after the expected landing; and the use of radiotelegraphy, radiotelephony, and data transfer throughout the operation—all at radically unprecedented distances. Collectively, these instruments attest to how quickly multiple and integrated forms of remote transmission and control became indispensable in developing the U.S. space program.

In 1962, the relation between space transportation and communication converged in Telstar I, an active-repeater communication satellite for global communication links that facilitated the first live, transcontinental telecast. Telstar represented a significant milestone in the formation of the U.S. space program and in the governmental rationality developing around this program for several reasons. First, Telstar represented the space program as a model for a new governmental rationality by breaking down the previous distinctions between military and civilian projects, and between public and private institutions. More than previous communication satellites, Telstar was

designed and deployed as a cooperative venture between government and a consortium of the leaders of the U.S. communications industry—specifically, AT&T, RCA, ITT, and GTE. In 1962, an act of Congress permitted the formation of the Communication Satellite Corporation, capitalized by these companies and by the federal government. Second, Telstar was vital to publicizing the space program's capacity for global public relations and as a popular spectacle of national mobilization. Telstar celebrated the "tele-visibility" of the space program, which increasingly relied on telecasts from outer space to represent astronomical missions for television audiences in the United States and abroad. Third, Telstar marked the historical juncture when "broadcasting" as a national project began to be replaced by a new globalism facilitated by satellite telecasting. Telstar, in other words, redefined the objectives, capacities, and purview of television, and it celebrated a new *televisual stage* of globalism even though the telecasts emanated to and from North America and (via the Eurovision network) Western Europe. Through Telstar, this new stage of globalism became associated with, and virtually linked by, astronomical transport and satellite communication.

Unlike Russia, the United States moved quickly, through Telstar and subsequent telecasts of U.S. space missions, to shape a global imagination about outer space. Telstar also displayed the United States' accomplishment in outer space as a new standard of being modern and future-oriented; it represented the nation's new global telepresence in a world organized and exhibited via U.S. television production and distribution. The very first image and sound sent to outer space and back, and transmitted through the transnational network that Telstar launched, was an American flag pulsating to the U.S. national anthem in front of a futuristic, white, spherical radome at Andover, Maine. Later, as the satellite passed over the Northern Hemisphere, it transmitted a sequence of broadcasts representing various regions of the United States and Western Europe. Telstar's America linked new and familiar sites and sights (the Seattle World's Fair, Mount Rushmore, a Native American, John Kennedy in Washington, the Manhattan skyline, the Statue of Liberty) bundled and distributed as part of a new global map.

Telstar and contemporaneous astronomical exercises thus called into question an early-modern logic of mediation organizing the space of terrestrial flows, terrestrial distance, and the territorial sovereignty of nation-states. As part of a new political and cultural economy from outer space, and in imparting the sensation of simultaneity, Telstar muted questions and concerns about violating the vertical limits of sovereignty. Telstar telecasting depended upon the new linkage between astronomical transport and communication—a regime of transport and communication that David Harvey and others decades later would describe as the "time-space compression" of a late-modern (or, in Harvey's terms, "postmodern") globalism.¹⁵ If, as Armand

Mattelart noted, communication was an idea or practice invented in the late eighteenth and nineteenth centuries as a condition of the idea of internationalism, then astronautical transport and communication were integral to a new stage of globalism—referred to in the late twentieth century as “globalization.”

The globalization of Telstar and of subsequent communication satellites (such as the 1965 Early Bird satellite, a geo-stationary active repeater satellite that transmitted the first World Town Meeting) was not just about intercontinental simultaneity—or a new spatio-temporal relation between the living room and places thousands of miles away—or the emerging idea that outer space was the path to virtual space (for example, the telecast photo of Telstar by the Associated Press via Telstar for international distribution as a news story). Telstar made outer space available as a stage for a new, globalized representation of liberal governance, with the U.S. space program (a new kind of venture between the state and civilian institutions) as provider and broker of a globalized network.

The early spy and communication satellites, as well as manned space flights, occurred on a “third-dimensional” space that so exceeded the previous practices of flyovers as to transcend rule of nation-states. By the mid-1960s, the vertical limits of some satellites made them appear from Earth to be relatively stationary objects. Orbiting craft thus extended the limits of national sovereignty while claiming a new position—a third-dimensional space of freedom—where the laws and customs governing those borders did not necessarily apply. In certain respects, the enactment of the Space Act of 1958 was as much a response to Sputnik’s ungovernability as it was a response to international consensus. Formalized in 1955 by nongovernmental associations of scientists, the Space Act provided that satellites—as exercises in science and communication, rather than strictly military exercises—did not constitute a breach of national sovereignty and thus were not a basis for war but were instead conditions for international peace. In other words, the Space Act was as much about a national insecurity as it was a statement about the changing conditions of freedom represented by the new dimension of space.

The proliferation of astronautical programs thus represented a new stage in the objectives of liberal government, particularly for the United States. The U.S. space program was rationalized as a technique for protecting and expanding a free society. Arguably, the massive scale of the space program indicated not just a resolve but a preoccupation about “open skies” and securing outer space as a new world stage for exercising freedoms, even as the United States and Russia were the only nations capable of operating in and from outer space, and even though protecting and expanding freedoms rested on new governmental technologies such as the space program. Astro-

nautical space, as a space for a new convergence between communication and transportation, thus became a terrain where freedom and government could be reinvented, projected, and exercised. Liberalism, as governmental rationality, was redefined within the space metaphor and project. Outer space became the latest (and purportedly the ultimate) space of liberalization—a condition of reshaping the world through open skies. Outer space also became a new paradigm and a new object of liberal reform, while the space program supported a new paradigm and a new object of liberal government, and a new way of understanding the relation between *laissez-passer* and *laissez-faire*.

Reinventing Government and National Sovereignty in Cyberspace

As described here, history up to the mid-1960s emphasized how the ether became an object of reasoning about advancing liberal government, and how communication and transportation technology came to matter conjointly in programs for opening, securing, and governing an “outer space.” This occurred as extraterrestrial space became an extension of transnational terrestrial networks and, as such, an objective in reinventing and advancing the global technology of liberal government. In essence, extraterrestrial space became a branch of global government. This history has current implications, particularly through the invention of “cyberspace,” a term that gained currency during the 1990s through a neoliberal rationality about governing and securing the spaces of communication and transportation. In some respects, the invention of cyberspace acted on and repurposed the technical infrastructure and networks of air space and outer space. Just as the invention of air space and outer space occurred through various regimes and arrangements of transnational and global government, cyberspace also emerged as a prominent stage for advancing liberalism (historically and geographically), even as it problematized global, neoliberal government.

A thorough genealogy of cyberspace might actually begin as far back as the ancient Greeks, who used the word “*kybernetes*” to mean a steersman or governor, or to early Western uses of the term “cybernetic” to refer to the art or science of government. As early as 1948, Norbert Wiener adopted the same word in order to describe an entire field of theory about communication and control in animals and machines.¹⁶ Although Wiener was particularly interested in the nineteenth-century scientific studies of control dynamics and feedback mechanisms (the “governor” being a device crucial to the invention of self-regulating machinery), even this branch of scientific invention and experiment was imbricated in nineteenth-century rationalities about liberal government, as when the French electro-physicist André-Marie Ampère adopted the term “*cybernetique*” to describe “the future science of government.” The scientific discourse about the control dynamics

of self-communicating and self-regulating machines provided the model for and technology of the modern liberal ideal of governing at a distance, thus linking self-governing machinery and self-governing social bodies, even if the term "cybernetics" would not gain significant traction until the second half of the twentieth century.¹⁷

During the 1990s, "cyberspace" typically referred to a "virtual" reality/space of computer-based communication and transport. This use of the term often placed considerable emphasis on cyberspace as the "end of geography"—an absolute ethereality, a space free of terrestrial impediments, a "no place." As Tiziana Terranova has pointed out, it is no coincidence that the view of cyberspace as a virtual or nonplace became a framework for a discourse about globalization as time-space compression: "Where the most common image of cyberspace used to be that of a virtual-reality environment characterized by direct interface and full immersion . . . , now the image is that of a common space of information flows in which the political and cultural stakes of globalization are played out."¹⁸ Similarly, it is no coincidence that the emergence of a discourse about cyberspace as a new globalized space of communication and transport developed through a neoliberal rationality not just about free trade and global markets (a new economic liberalization in the narrow sense) but dedicated to privatizing and outsourcing public services and cultivating self-enterprising, self-empowered, and self-reliant citizens. The Clinton administration's projection of a national "information superhighway" became one of the instruments and objectives articulated through the administration's implementation of a National Partnership for Reinventing Government—a political rationality about the virtue of public-private partnerships in improving the workings of liberal government.¹⁹ Less than three months into his presidency, on March 3, 1993, President Clinton told the nation, "Our goal is to make the entire federal government less expensive and more efficient, and to change the culture of our national bureaucracy away from complacency and entitlement toward initiative and empowerment."²⁰ Key to the modernization and makeover of government through private initiative and empowerment was the computer and information technologization that had begun to transform the banking and business sectors while also becoming a new target of investment and a model for an entrepreneurial economy—an "e-economy." President Clinton and Vice President Gore frequently compared the information superhighway to the transformations accompanying the creation of a federal highway system during the 1950s; thus cyberspace as "information superhighway" became central to an emergent liberal governmental rationality precisely at the time that outer space was becoming the "dormant frontier."

Although Vincent Mosco is right to point out that cyberspace was invented within a liberal rationality oriented toward a new stage of market

freedoms, and although the reinvention of liberal government in and through cyberspace often was predicated upon a triumphalism about liberalism (and the space race) at the end of the Cold War, the "end of history" forecast by champions of a neoliberalism such as Frances Fukuyama (and emphasized by Mosco) was envisaged by those champions as a *return* to a purer state of freedoms but also as an acceleration of this state of freedom far beyond the limited communication networks of earlier periods.²¹ In this sense, the invention of cyberspace as a time and space of government harkened back to air space and outer space as the most open and least impeded spaces of government. Air space and outer space became *objective correlatives* for a neoliberal reasoning about reinventing spatial states of freedom and government—states "predetermined to correspond to the pre-existing idea in [their] living power . . . [that was] essential to the evolution of [their] proper end."²²

This "back to the future" of liberal government was not exactly what William J. Mitchell referred to when he likened the electronic frontier of cyberspace to the Wild West in his influential (albeit much criticized) account of cyberspace as the end of geography ("a new land beyond the horizon").²³ However, Mitchell acknowledges (at least around the edges) the potential for risk and the need for securitization, noting that cyberspace would inevitably attract con artists and conquerors cut from the same cloth as those in the Wild West.

By the first decade of the twenty-first century, following but not simply a consequence of the World Trade Center attacks of 2001, the Bush administration's rearticulation of reinventing government played out partly along two fronts—one involving a profound deepening of federalism, privatization, outsourcing, and deregulation (the formula that less government equals greater freedom), and the other involving sweeping reforms for securitizing a "homeland" through a massive, decentralized administrative apparatus, the Department of Homeland Security. In no way were these two fronts incommensurate or contradictory; maximizing the localization, privatization, and personalization of government (the new "powers of freedom") opened up threats and instabilities for which a new regime of securitization could be rationalized.

One tool in this new regime of liberalization and securitization was the formulation of a National Strategy to Secure Cyberspace (NSSC)—a policy initiative that considered cyberspace to be a new problem of national and international security and thus a new problem of government.²⁴ Not only did the strategy adopt the expression "cyberspace" as a relatively new instrument and problem of government unfolding across various scales and through multiple agents (for example, as global and national government, public and private government, and the responsibility of self-governing citizens), it also

cast cyberspace as a field of warfare and a virtual front in a war on terror being conducted on these various scales and by these multiple agents. This field of warfare occurred somewhere between peacetime and a perpetual state of alert. The NSSC articulated the security of a nation in cyberspace to a new stage of *partnership* between "the way that business is transacted [and the way] government operates."²⁵

The NSSC proposed a concerted response to a set of threats that were both similar to and different from the ones that had been attributed to air space and outer space. At one point, it stated that "in the 1950s and 1960s, our nation became vulnerable to attacks from aircraft and missiles for the first time. The federal government responded by creating a national system to monitor our airspace. . . . Today, the nation's critical assets could be attacked in cyberspace. The United States now requires a different kind of national response system in order to detect potentially damaging activity in cyberspace."²⁶ In a policy document replete with visual illustrations, this statement followed an image of an individual (in shadowy silhouette) operating a personal computer in front of an enormous map of the world, with North America positioned between the individual's head and computer screen. The NSSC's map of cyberspace thus located the nation's insecure place within a world lacking limits and boundaries. If air space and outer space problematized the vertical limits of sovereignty, the NSSC's map of cyberspace accentuated the safety of a past "geographic isolation that helped protect the United States from direct physical invasion," noting that "in cyberspace, national boundaries have little meaning."²⁷ On a timeline that begins in 1995, a date that the NSSC attributed to the onset of an unsecured cyberspace, the strategy represented the security threats (and incidents handled) as spiking dramatically between 2000 and 2002, the first years of the George W. Bush administration.

By underscoring that cyberspace can best be secured by public-private partnerships and vigilant citizens, the NSSC cast cyberspace as a space for demonstrating not simply the *virtue* of but the *need* to accelerate a national strategy for reinventing government. The NSSC's mantra of public-private partnership and citizen empowerment suggested that its goal was nothing short of governing and securitization throughout society and that its insecurities about threats to cyberspace were comparable to its insecurities about a state that governs too much. As President Bush stated in his letter attached at the beginning of the NSSC, "Securing cyberspace is an extraordinarily difficult strategic challenge that requires a coordinated and focused effort from our entire society—the federal government, state and local government, the private sector, and the American people. . . . The cornerstone of American cyberspace security strategy is and will remain a public-private partnership."²⁸ And the authors of the strategy note later in the document

that "our traditions of federalism and limited government require organizations outside the federal government take the lead in many [of] these efforts [to defend cyberspace]," noting that the Partnership for Critical Infrastructure Security has "played a unique role in facilitating private-sector contributions to the Strategy"²⁹ because "broad regulations mandating how all corporations must configure their information systems could divert more successful efforts by creating the *lowest common denominator approach* to cybersecurity."³⁰ The strategy's reasoning about the need for a flexible response that matches the threats and supposedly unregulated nature of cyberspace assumed that private "partnerships" (as crucial to reinventing government within a flexible economy) were more suited to the government of cyberspace than were older models of state regulation.

The political rationality of reinventing government informed the creation, design, and strategies of the Department of Homeland Security a few months after the NSSC was drafted. The Department of Homeland Security became the largest federal agency created since the immediate post-World War II years, even as it operated as a mechanism for coordinating numerous smaller agencies and initiatives such as ones overseeing cybersecurity and "public-private partnerships" for safety and security. In short, the department became a massive interagency network for assuring that the role of government in national security was privatized—dispersed throughout society, often through do-it-yourself resources for the self-defensive citizen-soldier³¹—even as its corporate partnerships operated as unregulated instruments under the Bush administration for spying on citizens' telephonic and Internet communications.

According to the NSSC, the healthy functioning of cyberspace that is the basis for national security is best achieved as much by reinventing government in the United States as through a new regime of global governmentality. Securing a nation in cyberspace involves multiple strategies of international cooperation—a term that ambiguously suggested reciprocity but also a global alignment with U.S. interests. Key initiatives included an alignment of international organizations and industry that would promote a global "culture of security," developing secure networks through the heightened engagement between U.S. industries and their foreign counterparts, promotion of a "safe cyber zone" across North American countries, increased real-time sharing of information from international surveillance networks ("watch and warning networks"), and "encouraging other nations to accede to the Council on European Convention on Cybercrime."³² Nowhere, however, does the NSSC indicate a need for international agencies, such as those that proliferated in the West for the government of international communication and (subsequently) air space. Instead, the strategy emphasizes privatized, self-regulatory forms of securitization in and from nations. Although

these objectives appear at the end of the document, perhaps suggesting that they are an afterthought to the strategy's emphasis on national security and sovereignty, they clearly affirm that the NSSC understands the strategies for policing and waging war in cyberspace as one front in a global war on terror. On this count, the government of cyberspace is oriented as much toward securitization and policing as the healthiness and peacefulness of a world in cyberspace.

It remains unclear how substantively a national strategy for reinventing government and a national strategy for securing cyberspace will be modified. The latter strategy became an immediate preoccupation of the Obama administration, which moved the institutional authority of cyberspace securitization from the Department of Homeland Security to the National Security Council, sanctioned the Pentagon's organization of a new offensive and defensive operational wing for "cyber-command," and announced the creation of a national "cyber-czar" (also cast more modestly and bureaucratically as the "cyber-coordinator"). In May 2009, President Obama provided a formal rationale for his administration's cybersecurity strategy, which declared the digital infrastructure to be a national asset upon which economic prosperity, public safety, and national security depended. Although this strategy sought to reassure U.S. citizens that it would correct the invasions of their individual privacy perpetrated under the Bush administration, it also stressed the need to ratchet up the comprehensiveness of a cybersecurity program—to make the program better suited to citizens' constant immersion in cyberspace.

Conclusion

The prior section's silence about satellites and extraterrestrial media may seem anathema to the primary sense that chapters in this book make of the expression "down to Earth." Of course there are important connections to be drawn between current satellite media and cyberspace's production, and government and securitization. It is my hope that the history charted here poses useful questions for future research about those connections, since addressing them lies beyond the scope of this chapter. That said, it is worth mentioning a few reasons for following the current line of analysis.

As Henri Lefebvre famously noted, space is not only produced, it is productive of future modes of production; it plays a role in making history.³³ This chapter has considered how "air space" and "outer space" were produced by a field of government that subsequently underpinned and was reinvented through cyberspace. In that sense, it outlines a way of thinking about how the government of cyberspace was not determined purely or primarily by technological invention and experimentation, unless one is willing to consider air space, outer space, and cyberspace (after Andrew Barry) as "techno-

logical zones" of government—government not just of spaces defined and demarcated by geographical and territorial boundaries but of "zones formed through the circulation of technical practices and devices."³⁴ Cyberspace has operated as a technological zone not only of government but also for re-inventing and "advancing" liberal government in the first decade of the twenty-first century. In this sense, we might weigh not only how the Obama administration rationalizes expanding the scope of cyber-securitization while correcting the invasions of privacy perpetrated under the Bush administration but also how making those corrections has involved the Department of Homeland Security's contemporaneous declaration that it would no longer authorize the use of satellite imaging for "spying" on U.S. citizens or coordinating police operations on them.

The technological zone of government that was at stake across the invention of air space, outer space, and cyberspace was international and, by the late twentieth century, global. The problem of maintaining this technological zone called forth successive agencies, standards, and regimes of international and global government. In this sense, the invention and government of cyberspace are nothing new. They have perpetuated, if not deepened, the late-nineteenth-century problem surrounding transnational communication and transportation—the "openness" not only of borders but of the less easily marked limits of air space and outer space, and the ongoing initiatives to rationalize and thus make peaceful and orderly the zones that are most difficult to govern because they represent the limits of national sovereignty. The invention and government of cyberspace (particularly the governmental problems of monitoring "foreign-ness" within a home territory) thus perpetuated or deepened a disposition of nineteenth-century liberal government.

However, the invention and government of cyberspace also have been shaped through and are productive of a new stage of liberal government wherein the virtue of open borders is matched, in and from the United States, by the creation of a national strategy (and subsequently a massive Department of Homeland Security) to secure and manage cyberspace—the ethereal *medium* for waging an ethereal "global war on terror." Securing cyberspace is predicated on the invocation of air space and outer space as historical templates of maximum freedom and maximum threat, as much as on a reasoning about having entered a new ("advanced") historical technological zone wherein government is not simply oriented above us (air space and outer space as a New or Final Frontier) but all around us, throughout life, in the unbearable lightness of being communicating and mobile subjects in the current technological zones of government. In this sense, cyberspace is the Babel Complex of the current (neo-)liberal governmentality, though a Babel Complex that turns on a new articulation of public and

private government, and more than ever on the immanence (the “down-to-Earth-ness”) of monitoring foreign-ness within the most routine and familiar enactments of citizenship.

NOTES

- 1 James W. Carey, “Technology & Ideology: The Case of the Telegraph,” in *Communication as Culture* (Boston: Unwin-Hyman, 1989); Armand Mattelart, *The Invention of Communication* (Minneapolis: University Minnesota Press, 1996); see also James Hay, “Between Cultural Materialism & Spatial Materialism,” in *Thinking with James Carey: Essays on Communications, Transportation, History*, ed. Jeremy Packer and Craig Robertson (New York: Peter Lang, 2006).
- 2 Michel Foucault, “Governmentality,” in *Security, Territory, Population: Lectures at the Collège de France, 1977–78* (New York: Picador/Palgrave-Macmillan, 2009).
- 3 Michel Foucault, “Space, Knowledge, Power,” in *Power: Essential Works, 1954–1984*, ed. James Faubion (New York: New Press, 2001); Foucault, “Governmentality.”
- 4 Andrew Barry, “Lines of Communication & Spaces of Rule,” in *Foucault & Political Reason*, ed. Andrew Barry, Thomas Osborne, and Nikolas Rose (Chicago: University of Chicago Press, 1996).
- 5 Craig Robertson, *The Passport in America* (Oxford: Oxford University Press, 2010).
- 6 Werner Sombart, quoted in Armand Mattelart, *Networking the World: 1794–2000* (Minneapolis: University of Minnesota Press, 2000), 7.
- 7 Roland Barthes, “The Eiffel Tower,” in *The Eiffel Tower & Other Mythologies* (New York: Hill & Wang, 1979). I also draw the expression “Babel Complex” from Barthes’s description of the Eiffel Tower, although I am deploying the term differently.
- 8 This distinction is implied in an early legal and policy doctrine; see Sir Henry Erle Richards, *Sovereignty over the Air* (Oxford: Clarendon Press, 1912), 5.
- 9 Edouard Rollin, cited in Harold D. Hazeltine, *The Law of the Air* (London: University of London Press, 1911), 8.
- 10 Hazeltine, *Law of the Air*.
- 11 M. Paul Fauchille, *La circulation aërienne et les droits des États en temps de paix* (Paris: Pedone, 1901/1910).
- 12 Hazeltine, *Law of the Air*, 80–81.
- 13 For a useful history on the relation of Radio City Music Hall to the vertical architectonics of New York City in the 1920s and 1930s, see Eric Gordon, “Invisible Empire of the Air,” *Space & Culture* 8(3) (2005): 247–263.
- 14 Andrew Haley, *Space Law & Government* (New York: Appleton-Century-Crofts, 1963), vii.
- 15 David Harvey, *The Condition of Postmodernity* (New York: Blackwell, 1990).
- 16 Norbert Wiener, *Cybernetics* (Cambridge, Mass.: MIT Press, 1948).
- 17 James Clerk Maxwell, “On Governors,” *Proceedings of the Royal Society* 16 (London, 1868): 270–283, cited in Norbert Wiener, *Cybernetics*, 2nd ed. (Cambridge, Mass.: MIT Press, 1961), 11–12.
- 18 Tiziana Terranova, *Network Cultures: Politics for the Information Age* (London: Pluto Press, 2004), 42.
- 19 For greater historical context and detail on the National Partnership for Reinventing Government, see David Osborne and Ted Gaebler, *Reinventing Govern-*

ment: How the Entrepreneurial Spirit Is Transforming the Public Sector (New York: Penguin, 1992); and Vincent Mosco, *The Digital Sublime: Myth, Power, and Cyberspace* (Cambridge, Mass.: MIT Press, 2004).

- 20 Transcript of President Clinton’s address to the nation, accessed April 1, 2011, <http://govinfo.library.unt.edu/npr/library/speeches/030393.html>.
- 21 Mosco, *Digital Sublime*; Francis Fukuyama, *The End of History and the Last Man* (New York: Free Press, 1992).
- 22 Washington Allston, *Lectures on Art* (New York: Baker & Scribner, 1850).
- 23 William J. Mitchell, *City of Bits: Space, Place, and the Infobahn* (Cambridge, Mass.: MIT Press, 1995).
- 24 The National Strategy to Secure Cyberspace (2003) (hereafter cited as NSSC), accessed April 1, 2011, http://www.us-cert.gov/reading_room/cyberspace_strategy.pdf.
- 25 Ibid., iii.
- 26 Ibid., 19.
- 27 Ibid., 7.
- 28 Ibid., iii.
- 29 Ibid., xiii.
- 30 Ibid., 15.
- 31 James Hay and Mark Andrejevic, “Homeland Insecurities,” *Cultural Studies* (July/September 2006): 331–348.
- 32 NSSC, 50–52.
- 33 Henri Lefebvre, *The Production of Space* (London: Blackwell, 1990).
- 34 Andrew Barry, *Political Machines* (New York: Continuum, 2001), 3.