

# Vital Systems Security: Reflexive Biopolitics and the Government of Emergency

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## Abstract

This article describes the historical emergence of vital systems security, analyzing it as a significant mutation in biopolitical modernity. The story begins in the early 20th century, when planners and policy-makers recognized the increasing dependence of collective life on interlinked systems such as transportation, electricity, and water. Over the following decades, new security mechanisms were invented to mitigate the vulnerability of these vital systems. While these techniques were initially developed as part of Cold War preparedness for nuclear war, they eventually migrated to domains beyond national security to address a range of anticipated emergencies, such as large-scale natural disasters, pandemic disease outbreaks, and disruptions of critical infrastructure. In these various contexts, vital systems security operates as a form of reflexive biopolitics, managing risks that have arisen as the result of modernization processes. This analysis sheds new light on current discussions of the government of emergency and 'states of exception'. Vital systems security does not require recourse to extraordinary executive powers. Rather, as an anticipatory technology for mitigating vulnerabilities and closing gaps in preparedness, it provides a ready-to-hand toolkit for administering emergencies as a normal part of constitutional government.

## Keywords

beck, biopolitics, disaster, emergency, Foucault, risk, security

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## Introduction

In recent years a series of catastrophes in the United States has starkly posed the question of government responsibility for anticipating and managing emergencies. From the terrorist attacks of 9/11 and the anthrax letters that followed soon after, to Hurricanes Katrina (2005) and Sandy (2012), to the financial crisis (2008–9) and the Gulf oil spill (2010), catastrophic events have been followed by widespread criticisms of the government's lack of preparedness. In response, the Federal Government has implemented measures that aim to improve its response capacity and to lessen the impact of such events on critical systems such as transportation, communication, energy and public health. These measures include the passage of major legislation, such as the Homeland Security Act (2002) and the Pandemic and All-Hazards Preparedness Act (2006); the creation of new agencies, such as the Department of Homeland Security and the Biomedical Advanced Research and Development Authority (BARDA); and the development of new policy frameworks such as critical infrastructure protection, pandemic preparedness, and systemic risk regulation. Most recently, cybersecurity has come to the center of political discussion, as government officials have become concerned with the vulnerability of vital information and communication networks to attack.

It is striking that in so many different policy arenas we find a shared understanding in political discourse both of what constitutes a catastrophe and of the expected government role in preparing for and responding to potentially catastrophic events. Catastrophes are understood as sudden and unpredictable events that disrupt the systems that are critical to economic and social life. And government is held responsible for reducing vulnerability to such events as well as for ensuring the operation of critical systems in their wake. Amid rancorous debates over government responsibility for managing disasters, these background assumptions have mostly gone unremarked – they are taken to be a matter of common sense. However, as we will show, such common sense is the result of a relatively recent 'event in thought' (Foucault, 2005: 9): it is only in the last several decades that American planners and policy-makers have come to understand collective life as dependent upon a complex of critical systems that are vulnerable to catastrophic disruption; and it is only over the same period that the vigilant protection of these systems in anticipation of emergency – what we call 'vital systems security' – has come to be regarded as a central problem for government. While this article focuses on developments in the United States, we understand vital systems security as a more general diagram of power that can now be observed in a range of national, transnational and global contexts.<sup>1</sup>

### *Reflexive Biopolitics*

In what follows, we analyze the emergence of vital systems security as a significant mutation in biopolitical modernity. Michel Foucault famously defined biopolitics by contrasting it with the juridico-legal power of classical sovereignty. Whereas classical sovereignty sought to ensure the security of the state itself in the face of foreign and domestic threats, modern biopolitics aims to ensure the health and wellbeing of national populations. Foucault's (2007) analysis of biopolitical modernity begins in the late 18th century, when government reformers grappled with the problems of burgeoning urban and industrial centers. Through the tools of what would later be called the social sciences, it was found that phenomena such as poverty, unemployment, crime and endemic disease had regular patterns of occurrence. Beginning in the first half of the 19th century, new apparatuses of population security such as public health and urban planning were invented to manage these problems. Here, the technical and political category of *risk* played a central role. Knowledge practices imported to public administration from the world of private insurance made it possible for governments to analyze how 'social' problems (whether poverty, disease or crime) were distributed over a population, and to assess the costs and benefits of measures to manage them (Ewald, 1991; Rose, 1999).

Vital systems security arose at a later conjuncture in the evolution of biopolitical government, beginning in the early 20th century. With the intensification of modernization and industrialization processes, planners and policy-makers recognized that collective life had become dependent upon interlinked systems such as transportation, electricity, and water. Indeed, the very instruments of biopolitical government, which aimed to foster the health and wellbeing of the population, came to be seen as potential sources of vulnerability. To cite a series of examples that we will encounter later in this article: early in the 20th century urban and regional planners observed that the infrastructures built to promote economic growth or to provide vital services to populations were vulnerable to catastrophic disruption (whether from labor strikes, natural disasters, or enemy sabotage); in the 1960s, hydrologists, geographers, and water resource managers found that dams and levees designed to protect populations from floods had in fact increased the likelihood of catastrophic losses; and in the 1980s, infectious disease specialists began to argue that the overuse of antibiotic drugs and the intensive global circulation of humans and animals had created vectors for the emergence and rapid spread of novel and deadly pathogens. With the recognition of such reflexive risks, as Ulrich Beck has noted (1992: 8), modernity became 'a theme and problem for itself'.

In pointing to the contemporary significance of risks generated by modernization processes, our account has certain parallels with

prominent analyses of 'risk society' (Giddens, 1990; Beck, 1992). In particular, we share Beck's interest in the limits of existing forms of risk management in addressing catastrophic threats such as massive natural disasters, technological accidents, or outbreaks of virulent new pathogens. As Beck has argued, the risks addressed in what he calls 'first modernity' (such as unemployment, disability, and endemic disease) were distributed over populations in regular and predictable ways, and were relatively constrained in scope. These risks could thus be managed using instruments of population security, such as private or public insurance. In contrast, Beck argues, the risks of 'second' (or 'reflexive') modernity are unprecedented and therefore impossible to calculate based on historical patterns of incidence, and they are potentially unbounded in temporal and geographic scope. For these reasons, he claims, such risks 'increasingly tend to escape the institutions for monitoring and protection in industrial society' (1994: 5).

But in other respects our account diverges from such discussions of risk society. Beck concludes that contemporary reflexive risks exceed rational assessment and mitigation altogether (e.g. Beck, 1992: 102). As a result, he looks to the rise of a new anti-technocratic 'sub-politics', in which an exposed public challenges the hubris of technocratic risk managers and demands the precautionary avoidance of uncertain but potentially catastrophic threats. In contrast, we focus on a different set of responses to reflexive risks. Although such risks exceed the capacities of population security mechanisms, we argue, this very challenge has led to the development of new security mechanisms designed to assess the vulnerability of vital systems and to ensure their continued functioning (Collier, 2008).

Vital systems security shares with population security the broad aim of biopolitics: to foster the health and welfare of populations. But these two forms of biopolitical security differ in their objects of concern, knowledge practices, and norms. Whereas population security addresses regularly occurring events that are distributed over the population in predictable ways, vital systems security deals with events whose probability cannot be precisely calculated, but whose consequences are potentially catastrophic. Vital systems security does not rely on statistical analysis of past events to generate knowledge about security threats, but rather on the simulation or enactment of potential future events. Its interventions seek to increase the resilience of critical systems and to bolster preparedness for future emergencies. Table 1 summarizes this distinction between two forms of biopolitical security, and contrasts both with 'sovereign state security'.

It should be underscored that this table is not meant to present a succession of historical stages; rather, it is an analytic grid that distinguishes among forms of collective security and identifies their elements. Although it is possible to trace the emergence of these forms of collective

**Table 1.** Three Forms of Collective Security

	Biopolitical Security	
	Population Security	Vital Systems Security
Form of Collective Security	Sovereign State Security	
Moment of Initial Articulation	17th century: absolutist states	Mid-20th century: nuclear preparedness
Aim	Strengthen and secure sovereignty against internal and external threats	Secure the functioning of modern life in the face of unpredictable but potentially catastrophic threats
Object of Concern	Bases of sovereign power: military strength, internal order, wealth	Vital systems: webs of industrial production, critical infrastructures, governmental apparatuses
Form of Knowledge	Raison d'état: knowledge about balance of power, domestic bases of sovereign power	System-vulnerability thinking: knowledge about interdependencies and vulnerabilities of vital systems
Characteristic Apparatuses	Diplomatic and military measures to increase internal and external security; mercantilist policies to increase sovereign wealth	Governmental preparedness; vulnerability reduction; emergency management

security to specific historical moments, each did not replace prior forms but rather arose in complex relation to them. For this reason, our account of the rise of vital systems security does not suggest an epochal analysis of radical transformation. Rather, it points to the examination of how different forms of security combine with one another, and how the elements of a new form of security have been installed in mechanisms of political administration.<sup>2</sup>

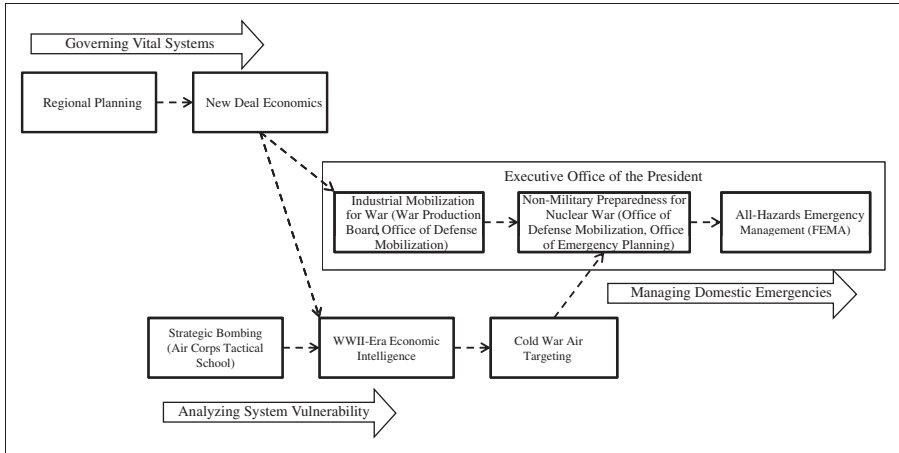
### Overview

Section I of this article describes the invention of ‘system-vulnerability thinking’ as a novel way of understanding and administering collective life. Our analysis focuses on early 20th-century developments, in fields such as regional planning and strategic bombing theory, that made it possible to understand social and economic life as a complex of systems that are essential to prosperity and welfare, but vulnerable to catastrophic disruption.

Section II describes the construction, in the context of the early Cold War, of an apparatus that combined knowledge practices for assessing the vulnerability of vital systems with governmental techniques for reducing vulnerability and for responding to potential emergencies. Faced with the specter of a sudden and catastrophic nuclear attack, national security planners forged an apparatus of ‘nuclear preparedness’ designed to mitigate the vulnerabilities of domestic vital systems.

Section III examines the establishment of the administrative machinery through which vital systems security entered governmental practice. We show that the development of this administrative machinery was initially distinct from the genealogy of vital systems security traced in the prior sections. It was established within executive branch offices that were created to address economic emergencies – from the Great Depression to the economic mobilization for the Second World War and the Korean War. During the 1950s, with increasing international tensions of the early Cold War, these executive branch offices turned from emergency economic mobilization to domestic preparedness for nuclear attack. Here, the administrative machinery for governing emergency was combined with the elements of vital systems security to form a distinctive ‘political technology of emergency’. Figure 1 summarizes how this process unfolded in the United States.

Section IV traces how, beginning in the mid-1960s, the techniques, forms of expertise, and administrative structures that had been developed in the name of nuclear preparedness migrated to other domains, ranging from disaster management, to infrastructure policy, to public health. We argue that the tools of vital systems security were brought to bear as a form of *reflexive biopolitics*, addressing threats that were understood to outstrip the capacities of existing population security mechanisms.



**Figure 1.** A Topology of Emergency Government.

In conclusion, we argue that the genealogy of vital systems security provides a distinctive perspective on how liberal democracies have conceptualized and managed the problem of emergency. Much recent work on this topic has focused on ‘states of exception’ through which sovereign power has dangerously extended its hold over collective life. However, this general diagnosis ignores a prominent way in which liberal polities govern emergency situations today. As an anticipatory technology for mitigating vulnerabilities and closing gaps in preparedness, vital systems security provides a ready-to-hand toolkit for administering emergencies as a normal part of constitutional government.

## I. Vital, Vulnerable Systems

This section explores the emergence of a novel way of thinking about collective life – as a complex of vital but vulnerable systems. We analyze this development in relation to a longer trajectory of biopolitical government. In his lectures on biopolitics, Foucault argued that the problem of governing collective life was initially articulated in relation to urban conditions in Europe in the late 18th and early 19th centuries. The rapid growth of towns and related phenomena such as the expansion of industry, the intensification of trade, and crowded living conditions posed ‘new and specific economic and political problems of governmental technique’ (Foucault, 2007: 64). Population security apparatuses such as economic regulation, urban planning and public health were organized to manage these problems of the ‘fine materiality of human existence and coexistence, of exchange and circulation’ (Foucault, 2007: 339). These security apparatuses carved out a new field of political concern, not only through theoretical reflection but also through governmental practice. In

efforts to organize conscription for war, reduce the toll of epidemics, or manage economic fluctuations, government bureaucracies generated vast amounts of systematic data about rates of marriage, birth, illness, and death; suicide and crime; and levels of production and unemployment. This 'avalanche of printed numbers' (Hacking, 1990) made possible a new, statistical understanding of collective life as a field of regular events that could be traced from a known past to a future that was understood in terms of a distribution of probabilities. 'Population' was thus constituted as a complex reality and a grid of intelligibility for governmental problems (Foucault, 2007).

System vulnerability thinking arose at a later conjuncture, in the early 20th century. During this period, governmental efforts to understand and manage collective life (the 'fine materiality of existence and coexistence, exchange and circulation') expanded dramatically. Infrastructure construction and regulation became a privileged method for governing vital flows in an urban and industrial society. For example, during the 1920s urban planners and public administrators in rapidly growing metropolitan areas such as Chicago and New York focused attention on the complex interdependencies among different parts of the regional economy, and on the vital energy and transportation systems that linked these parts together. They understood the construction and rationalization of these circulatory systems as a means to ameliorate problems of overcrowding and congestion and to promote future prosperity (Fishman, 1997; Platt, 1993). Similar concerns animated New Deal planners who guided the Federal Government's massive program to reshape 'the movement of people, goods, electricity, water, and waste' in the US through investment in public works (Smith, 2006: 2). Governmental regulation of the production and circulation of materials through the national economy reached its apotheosis during the Second World War when New Deal planners recruited to the war mobilization agencies undertook the task of 'organizing the bulk of the industrial resources of the country into a single integrated production mechanism' (Novick et al., 1949: 179).

As in the episodes described above from the early 19th century, these new instruments of population security rested on new forms of knowledge about collective life. In order to plan public works projects and optimize production chains, urban planners and economists developed a 'science of flows' that mapped the interdependent systems that comprised a modern economy, and investigated how disturbances (whether the result of external shocks or government policies) would propagate through these systems. This science of flows – a forerunner of what, after the Second World War, would be called systems analysis – made it possible to understand collective life as a complex of vital systems, whether on the scale of a city, a region, or the nation as a whole.

But even as the government of vital systems became a major tool of population security in the first half of the 20th century, experts in diverse



areas – from regional planning to airpower theory – became concerned about the increasing dependence of modern society on electricity grids, transportation networks, and water systems. They recognized that if complex, large-scale systems were indispensable for the growth of complex urban-industrial societies, they also made these societies vulnerable to sudden and potentially catastrophic disruption.<sup>3</sup>

For American regional planners, the experience of the First World War provided a startling demonstration of the fragility of urban infrastructure systems and webs of industrial production. The surge in industrial demand sparked by war mobilization led to massive disruptions in power supplies and transportation capacity as well as scarcities of critical materials. In parts of the country, these disruptions brought military-industrial production to a standstill. Meanwhile, as historian Harold Platt (1993: 130) recounts, ‘for the first time, city dwellers confronted terrifying famines of food and fuel, exacerbated by a virtual gridlock of the nation’s transportation’.<sup>4</sup>

The experience of the First World War led to similar reflections about system vulnerability among military strategists. It had long been recognized that in an era of total war between nations, the strength of a nation’s economy and population was essential to its military power. By the same token, strategists argued, the disruption of systems critical to the enemy’s industrial production should be a central strategic aim. The advent of the airplane – which made its initial appearance toward the end of the war – raised the possibility of passing over enemy lines and directly striking critical industrial and infrastructural targets. In light of this new strategic horizon, interwar airpower advocates articulated a theory of ‘strategic bombing’ according to which an enemy’s military power was tied to a complex of power plants, rail networks, and key industrial facilities whose destruction could disable the enemy’s capacity to wage war (Biddle, 2002). As the pioneering American air strategist William Sherman (1926: 197) wrote, ‘industry consists of a complex system of interlocking factories, each of which makes only its allotted part of the whole’, and ‘this very quality of modern industry renders it vulnerable’ to a targeted attack. Sherman argued that air power should target the enemy’s ‘system of supply’ – the entire complex of industrial enterprises, energy infrastructures, and transportation networks involved in mobilizing a modern army.

System-vulnerability thinking was honed in reflection on airpower strategy over the course of the 1930s and early 1940s. Theorists at the US Army’s Air Corps Tactical School (ACTS) formulated a strategy of high-altitude daylight precision bombing that aimed to disrupt an enemy’s military-industrial production system by destroying a small number of critical nodes. As one ACTS instructor put it, ‘a very small number of hits on a few sensitive spots could cause collapse of the life-sustaining vital systems’ (Hansell, 1986: 14). This strategy depended on

gathering detailed knowledge about the enemy economy that could be used to define precise bombing objectives.

In the process of mobilization for the Second World War, ACTS theorists played a leading role in formulating plans for Allied air strikes (Biddle, 2002). However, they lacked rigorous tools for assessing the relative vulnerability of different enemy industrial production systems in order to prioritize bombing targets. To address this problem, as the US entered the European Theater in 1942, air war planners recruited a number of New Deal economists to analyze German war production facilities and to make recommendations for Allied bombing priorities (Guglielmo, 2008; Katz, 1989). These economists drew on the science of flows (invented, as noted above, to plan government interventions to alleviate the Depression and to rationalize war mobilization) to guide air war planners to the most 'productive' bombing targets in an enemy's industrial production system. In this context, they developed the first formalized and authoritative method for analyzing system vulnerability – an 'economics of strategic target selection' (Coker, 1949).

## **II. Reducing Vulnerability: The Nuclear Preparedness Apparatus**

For US military strategists before and during the Second World War, domestic war mobilization and strategic bombing of the enemy were merely two sides of the same coin. Strategists understood the war as a struggle among competing 'military-industrial complexes' and assumed that the nation with the greater capacity to produce the instruments of industrial war would prove victorious.<sup>5</sup> The challenge of mobilizing US industrial production systems found its counterpart in attempts to destroy the enemy's industrial capacity. But during the Second World War, American war planners did not have to confront the vulnerability of American cities and industry, since the country was never subjected to sustained bombing campaigns. It was only in the immediate postwar period, during the early Cold War, that reducing the vulnerability of the US to a surprise enemy attack was defined as an urgent technical problem and political concern. This section examines how, in this context, the first vital systems security apparatus was assembled.

As the Second World War ended and US military strategists began to envision the next war, they articulated what historian Michael Sherry (1977) has called an 'ideology of preparedness'. Warning that the next war would begin with a surprise Soviet nuclear attack on American cities and industries, they argued that the US would not have the luxury of a long period during which to mobilize its industrial-military power as in the prior two wars. The new doctrine of 'national security' called for the country to maintain a state of ongoing readiness to withstand and respond to a sudden nuclear attack (Yergin, 1990). In the view of

national security advocates, such preparedness would require a massive effort to bolster American military power through investment in offensive technologies (such as nuclear weapons, long-range bombers, and missiles) and 'active' defense measures (such as remote sensing and anti-aircraft systems). It would also require a program of what was termed 'passive' or 'non-military' defense to ensure the functioning of vital systems in the wake of an enemy attack. As one prominent report put it, the aim of passive defense was to 'strengthen our capacity to substantially withstand attack, our national resiliency, by insuring the continuity of civil government and the protection of civilian life'. For advocates of passive defense in the face of the nuclear threat, such measures were the 'indispensable means to national survival' (US House of Representatives, 1956: v).

Historians of Cold War domestic preparedness have mainly focused on 'civil defense' as conducted under the aegis of the Federal Civil Defense Administration, a poorly funded and, in the early to mid-1950s, relatively marginal organization that was charged with assisting localities in preparing emergency response plans (e.g. Garrison, 2006). Here, however, we look at a much more powerful government agency, though one that has been surprisingly neglected in Cold War scholarship: the Office of Defense Mobilization (ODM), located in the Executive Office of the President.<sup>6</sup> ODM is significant for our purposes as a setting in which many of the knowledge forms and practices of intervention characteristic of vital systems security were initially assembled.

Based on powers created by the 1950 Defense Production Act (discussed below), President Harry Truman established ODM in late 1950 to manage the economic challenges posed by mobilization for the Korean War: maximizing war production while minimizing disruptions of the domestic economy. These mobilization tasks receded in 1953, as combat in Korea came to an end. But with the intensification of the Cold War, and with the rising specter of nuclear attack on the United States, ODM's mission shifted to the demands of non-military defense described above. As one government report later put it, ODM's competencies expanded to include not only 'the whole complex of non-military activities necessary to prepare or "mobilize" the economy against possible war', but also those measures that were necessary 'to survive and emerge from the ashes of attack, to maintain the continuity of government and essential production, to proceed toward partial recovery and then toward full resumption of peacetime pursuits' (US House, 1956: 16). The mission set out for ODM, in short, was to assure the continued functioning or restoration of systems that were vital to government operations, economic processes, and civilian life in the event of nuclear attack.

While it may seem surprising that a war mobilization agency would be charged with addressing such problems of 'non-military' defense, ODM

was a likely candidate to take up this role for two reasons. First, as we will see in the next section, during the World War II and the Korean War, the mobilization agencies had exercised many of the emergency authorities that were granted to the executive branch by Congress to manage the war. As a successor to these agencies, ODM was a logical place to house emergency executive powers in the early Cold War, particularly those related to economic vulnerability and government preparedness. Second, ODM officials possessed a distinctive expertise in understanding and managing the nation's industrial production systems and vital infrastructures. When ODM was initially formed in 1950, it inherited analytic tools and key personnel from the World War II mobilization agencies, and these personnel recreated the mobilization apparatus for a new war.<sup>7</sup> Thus, by 1953 the experts and officials on the ODM staff had accumulated a deep experience in understanding and managing the national economy as a complex of vital systems.

This experience was immediately relevant for addressing the novel demands of non-military defense as they were understood in the early 1950s. Mirroring the assumptions of strategic bombing theory, non-military defense planners argued that the underpinnings of domestic economic and political life would be the enemy's primary target in the next war. As Ramsay Potts, a World War II air bomber and prominent Cold War preparedness planner, put it in 1953:

Big concentrations of manpower, vital industry, and government within small areas make excellent targets for modern weapons of mass destruction. . . . A few high-yield bombs exploded over the centers of several of them can disrupt manufacturing, transportation, communications, government, business management, labor forces, and most of the other elements of a smooth running economy.

The task of non-military defense thus entailed 'distributing, protecting, and organizing the country's operating capacity [so] that it cannot be critically weakened by any attack or series of attacks an enemy is able to deliver'. Achieving this, Potts elaborated, 'is a twofold matter of (1) reducing the nation's susceptibility to damage; and (2) increasing its powers of recovery from any damage' (Potts, 1953: 259).

To address these problems of non-military defense, experts and officials at ODM put in place a number of new governmental practices designed to mitigate the vulnerabilities of vital systems. Here we describe two such practices: vulnerability reduction and emergency preparedness.

*Vulnerability Reduction:* In 1953, as ODM began to take on non-military defense tasks, its officials sought to address what they called 'the bomb damage problem': assessing and mitigating the vulnerabilities of US industry and metropolitan areas to a nuclear attack. Shortly thereafter, ODM established a National Damage Assessment Center, which

was staffed by Air Force officers who had previously worked on air war planning during World War II and in the early Cold War. The economics of target selection and damage assessment, first honed in Second World War studies of enemy industrial-military production systems, were thus turned inward to the US.

Since past experience could not provide a meaningful guide to the catastrophic future of nuclear war, NDAC planners used techniques of ‘enactment’ to anticipate the effects of a Soviet nuclear attack and the circumstances that government officials would face in its aftermath (Collier, 2008; Collier and Lakoff, 2008a; Lakoff, 2007). For example, they developed methods of what was later called ‘catastrophe modeling’ to estimate how an attack would affect industrial production and the infrastructures that were required to sustain the population. Catastrophe modeling addressed a limitation of the knowledge practices associated with population security: their inability to assess the consequences of events about which there was no historical data. Indeed, ODM’s experts were acutely aware of this challenge. Air Force statistician Burke Horton, who served as Director of NDAC, later recalled:

In the earliest days of the National Damage Assessment Program it became apparent that adequate preparation for nuclear attack against the United States would require more than intuitive judgments based upon analysis of a number of hypothetical attacks. What was really required was a mapping of the new hazards in much the same way that temperatures and rainfall contour maps are prepared for agricultural purposes. The principal difference was that these maps needed to be prepared before it ‘rained’ the first time. (Horton, 1960–1: 34)

Either using their own computing facilities or through subcontracts with Cold War think tanks such as the Stanford Research Institute, NDAC analysts conducted numerous studies of specific vital systems – such as the oil system, electricity networks, chains of industrial production, and food systems. These studies examined the structure and vulnerabilities of such systems, as well as the effect their disruption would have on other systems: how would large-scale electricity blackouts in particular parts of the country affect military production? How would the destruction of oil pipelines affect transportation? NDAC’s analyses were meant to guide nuclear preparedness planners in designing measures to increase ‘national resiliency’ (US House of Representatives, 1956: v), so that the systems that sustained economic and social life in the US could ‘rebound relatively soon after the impact of strategic attack’ (Coker, 1949).<sup>8</sup> The NDAC analyses pointed to various measures for reducing vulnerability, including stockpiling critical materials,

decentralizing vital industrial facilities, building redundant infrastructures (such as communications networks), and creating standby production lines that could be ramped up in an emergency.

*Emergency Preparedness:* Another task that ODM planners considered essential to national resiliency was ensuring ‘the continuity of civil government’ (US House of Representatives, 1956: v) in the aftermath of a nuclear attack through practices of emergency preparedness. ODM played a central role in such efforts, most prominently through the annual ‘Operation Alert’ (OPAL) exercises. These scenario-based exercises were most widely known (and often derided, by both contemporaries and later critics) for their attempts to enlist the broader public in preparedness for nuclear war. But for non-military defense planners, their most important purpose was to test the effects of nuclear war on the government’s ability to perform its functions.

Building on the long-standing military practice of war gaming, planners designed these exercises to assess gaps in the government’s capability to respond to a nuclear emergency. For example, the OPAL exercises demonstrated that a nuclear attack would cause a nearly total breakdown in the command and control structure of the federal government, and that most government agencies were unable to identify priority emergency actions. These findings suggested new measures to bolster emergency preparedness: the establishment of emergency command facilities (such as the underground Mount Weather facility); provisions for inter-agency coordination; the creation of emergency protocols that defined priority actions in the wake of an attack; and further exercises, to better prepare government officials and emergency personnel (Krugler, 2006).

ODM’s activities were confined to the relatively limited domain of nuclear preparedness, and were shrouded in the secrecy of the Cold War. In this circumscribed domain, the agency addressed the classic concern of sovereign state security – defense of the polity against enemy attack. But as we have seen, in the era of total war sovereign state security was entangled with biopolitical government: mechanisms of population security were essential to military strength. In this context, vital systems security was addressed to the *reflexive* concern that the dependence of the nation’s military and economic power on mechanisms of population security had become a source of vulnerability. Thus, nuclear preparedness planners developed techniques for analyzing these mechanisms from the perspective of a catastrophic future that had no analogies in past experience. In doing so, they produced another ‘avalanche’ of data – a proliferation of catastrophe models, exercise reports, and vulnerability assessments – that made it possible to identify new objects of knowledge and targets of intervention. A new register of reality was thus carved out as an object of technical practice and political concern. Thus, in the arena of non-military preparedness for nuclear war, we can identify the outlines of a coherent diagram of power with its own

**Box 1. Vital Systems Security – A New Diagram of Power**

- *Objects of concern:* Systems that are vital to the functioning of the economy, the provisioning of metropolitan areas, and the operation of government, such as communications, energy, and transportation.
- *Aims and norms:* Increase the resilience of critical systems, in part by reducing their vulnerability to catastrophic disruption, and in part by increasing preparedness for governmental operations in the wake of a catastrophe.
- *Knowledge practices:* Enactment of uncertain events through tools such as vulnerability analyses, catastrophe models, and scenario-based exercises in order to understand the contours of a future catastrophe that has no precedent in past experience and to identify vulnerabilities and gaps in preparedness.
- *Techniques of intervention:* Measures to reduce vulnerability (construction of redundant infrastructures, stockpiling, dispersion) and to prepare for management of future emergencies (emergency standby facilities, command and control protocols to coordinate among diverse organizations, early warning systems, crisis communications systems).

objects, aims, forms of knowledge production, and tools of intervention (see Box 1).

### III. A Political Technology of Emergency

The first two sections of this article traced the invention of system vulnerability thinking, and examined how, during the early Cold War, it was combined with techniques of vulnerability reduction and emergency preparedness in the first apparatus of vital systems security. This section examines how vital systems security became a part of governmental practice in the US. Initially, an administrative machinery for governing emergency developed independently from the history of system-vulnerability thinking we have just described. It was forged in the 1930s and early 1940s in a series of executive branch offices that were charged with managing economic emergencies: ameliorating the Great Depression, and coordinating industrial mobilization during the Second World War and the Korean War. Following the Korean War, these economic functions were stripped away or repurposed, as the emergency management offices were charged with a new mission: domestic preparedness for nuclear attack. In this latter context, we see the formation of a distinctive political technology that combined elements of vital systems security with administrative tools for governing emergency.

The formation of this political technology of emergency must be understood in relation to widespread debates, amid the economic crises and growing international tensions of the interwar period, over the capacity of constitutional democracies to manage emergency situations. In the context of apparent threats to sovereignty faced by the Weimar government, for instance, Carl Schmitt famously argued that liberal democracy was incapable of adequately dealing with crises.<sup>9</sup> According to Schmitt, lawmakers could predict neither the kinds of problems that would arise in emergencies nor the means that would be required to deal with them. As political theorist William Scheuerman has noted, Schmitt argued that liberal jurisprudence – which called for ‘fixed, codified general norms, along with a strict separation of powers’ (Scheuerman, 1990–2000: 1887) – was necessarily ‘oriented to the past’. It had no way to address the ‘dictates of modern interventionist politics’ that ‘cry out for a legal system conducive to a present- and future-oriented *steering* of complex ever-changing economic scenarios’. Schmitt concluded that a sovereign dictatorship was the only solution to this inherent limitation of liberal polities.

In his early reflections on this problem, Schmitt pointed to the Roman institution of the ‘commissarial dictatorship’ as a potential solution to this otherwise fatal shortcoming of constitutional democracy (McCormick, 1997): an executive would be temporarily granted extraordinary powers until a crisis was brought to a close. By the time of his later, more well known (and infamous) work, such as *Political Theology*, Schmitt was convinced that liberalism was inherently incapable of measuring up to threats to sovereignty and so advocated a ‘sovereign dictatorship’ with unbounded power as the necessary response.<sup>10</sup> Whereas commissarial dictatorship was limited by the constitution, the authority of sovereign dictatorship was prior to, and not bound by, the limits of the constitution.

In the United States, debate over the scope of the government’s emergency powers was sparked by President Roosevelt’s 1933 proposal for massive economic intervention to address the Great Depression. This debate continued in the lead-up to the Second World War, in struggles over control of the wartime mobilization effort, and in the early Cold War, as the doctrine of preparedness provoked concern about the rise of a ‘garrison state’ (Hogan, 2000). In these contexts, a distinctive solution to the problem of executive emergency powers under liberal democracy was gradually assembled. Through a number of legislative acts in the 1930s, Congress granted the executive a set of specific capacities that could be used in the event of emergency, including temporary emergency powers, peacetime mobilization planning agencies, and a war cabinet. As Clinton Rossiter argued in his 1948 book *Constitutional Dictatorship*, each of these capacities should be understood as ‘a technique or device to which a constitutional government may resort in time of emergency’



(1948: 11).<sup>11</sup> Together, they formed an ‘administrative machinery’ (Rossiter, 1949: 1207) through which the president could manage emergency situations without being given open-ended, dictatorial powers.

### *The Expansion of Executive Authority*

Upon assuming office in 1933, President Roosevelt identified the devastating economic crisis as an ‘emergency’ that demanded urgent government action. In part, as Michelle Landis (1999) has shown, the rubric of emergency suggested an analogy between the Great Depression and other ‘acts of God’ – such as floods or drought – that were beyond the control of individuals and that called for unusual government assistance to citizens. But it also suggested an analogy to a war situation, when the executive was traditionally granted broad powers to manage exigencies that lawmakers could not anticipate. Thus, in his 1933 inaugural address, Roosevelt demanded ‘broad Executive power to wage a war’ against the economic emergency of the Great Depression ‘as great as the power that would be given . . . if we were in fact invaded by a foreign foe’ (quoted in Scheuerman, 1999–2000: 1871).

Roosevelt invoked the rhetoric of war emergency, in part, to justify exceptional economic measures such as the Federal Emergency Relief and Emergency Banking Acts of 1933. But as resistance to these emergency measures mounted—both in Congress and in the Courts—Roosevelt pushed for permanent governmental reforms that would enable the executive branch to respond flexibly to urgent crises for which specific legislative provision could not be made in advance. New Deal reformers saw such reforms as a solution to the dilemma Schmitt had diagnosed. They proposed to establish permanent economic planning agencies within the executive branch that would continuously analyze rapidly unfolding situations, providing both anticipatory knowledge of possible future economic crises and the capacity to monitor a given crisis as it unfolded. The executive would also be provided with specific and limited powers to address crisis situations as they arose, without recourse to exceptional measures.<sup>12</sup>

The Roosevelt administration’s efforts to expand executive authority were fiercely contested by critics who saw them as threats to the institutions of American democracy (Brinkley, 1995). Many of the early New Deal emergency measures were struck down by the Supreme Court, and Roosevelt struggled to secure funding from Congress for a succession of executive branch planning agencies that were established to provide information and advice about the rapidly unfolding economic crisis. Over time, however, the New Deal reforms dramatically expanded the power and capacity of the executive branch. Congress approved extensive governmental reforms in the 1939 Reorganization Act, which gave the president the authority to reorganize the executive branch. While the Act was officially justified as a measure to improve the administrative efficiency of

government, Roosevelt argued that it was necessary in order to show that liberal democracies could deal with war emergencies: 'In these days of ruthless attempts to destroy democratic governments', he wrote in his Message to Congress on the Act, 'it is baldly asserted that democracies must always be weak in order to be democratic at all; and that, therefore, it will be easy to crush all free states out of existence.' A streamlined and more powerful executive branch was essential, he argued, to ensure that democracy could be 'tough as well as tender hearted' (Roosevelt, 1939). Roosevelt's message was a rejoinder to those, like Schmitt, who considered liberal democracy incapable of adequate response to crisis.

### *Toward Emergency Management*

Between 1939 and 1942, Roosevelt used the new executive powers, granted by Congress along with existing statutes dating from World War I, to set up an administrative machinery for managing emergencies within the framework of constitutional government. Based on authority created by the 1939 Reorganization Act, Roosevelt put in place a series of new offices to manage the mobilization of industrial production systems and vital infrastructures for the war. Reorganization Plan #1 (1939) established the Executive Office of the President (EOP), which would later house Federal emergency management agencies, from ODM to the Federal Emergency Management Agency (FEMA), established in 1979.<sup>13</sup> The executive order that created EOP included provision for an Office of Emergency Management (OEM), a kind of 'office-in-embryo' (Rossiter, 1949: 1209) that could be constituted in the event of a national emergency. A 1940 administrative order then established OEM, referring specifically to the 'threatened national emergency' of war.

Although OEM was formed as a temporary agency to manage a specific crisis, members of the Roosevelt administration had a broader vision of its purview. A January 1941 executive order reshuffling its functions described OEM as a permanent office that would address 'any emergency' that might arise. William McReynolds, the first director of OEM, later clarified this vision: 'National emergencies are not confined to periods of war or intense preparation for defense. They may result from an economic debacle or from a drought, flood, earthquake, famine, epidemic, or other emergency threatening the public peace or safety' (McReynolds, 1941: 132). The crucial premise – which anticipated the doctrine of 'all-hazards planning' that emerged in the 1970s – was that this apparently diverse collection of events could be grouped under a common category of 'national emergencies' and that such events posed similar kinds of governmental problems and could thus be addressed using common techniques. Although the office was focused on 'the present defense program', McReynolds argued that OEM had been established on the basis of a more general 'theory of organization to meet a

national crisis regardless of its particular cause' (McReynolds, 1941: 141). In this vision, OEM was a model for the government of emergency that would last beyond the 'confined period of war'.

Here, then, was an administrative mechanism for governing emergencies designed to address the very limitations of constitutional democracy that Schmitt had diagnosed. OEM was a 'device through which [the president] can exercise immediate supervision and control over' emergency situations (McReynolds, 1941: 138). The office would house a permanent staff of experts in various fields who would be responsible for both preparing in advance for emergencies and constantly monitoring rapidly unfolding situations. But this permanent office would not involve a massive expansion of executive powers. In deference to suspicions about concentrating powers within the Executive Branch, McReynolds emphasized the principle that OEM would not have a large operational staff. Rather, in preparing for emergencies the office would employ the resources of existing federal agencies and departments that were subject to congressional oversight; it would be 'the place in which the Chief Executive can locate liaison, coordinating, and necessary operating activities relating to the emergency' (McReynolds, 1941: 138). Finally, this office would not be given open-ended, exceptional powers to act in emergencies, but would act through specific powers provided by Congress.

### *The Consolidation of a Political Technology of Emergency*

Notwithstanding this expansive vision of emergency management, during the early 1940s OEM devoted its efforts primarily to the war emergency, in particular to the coordination of the massive effort to mobilize US industry for war production. OEM housed a succession of temporary entities that played central roles in planning and managing war mobilization, and that exercised emergency powers related to price and production controls and to the allocation of scarce materials.

Immediately after the war, the mobilization offices were dismantled in the face of renewed conservative opposition to economic controls. But in the late 1940s, in the context of increasing international tensions, the problem of how to anticipate and govern emergencies within the framework of constitutional liberalism once again arose: how could the US maintain what was essentially a war footing without becoming a garrison state that threatened the institutions of democracy? Initially, President Truman resisted the re-institution of wartime emergency powers, but with the intensification of the Korean Crisis in the second half of 1950, he requested congressional approval of the Defense Production Act (DPA), which dramatically expanded executive power to organize war mobilization. The text of the Act warned of the 'ever-present threat of further Communist aggression which may seriously jeopardize the American economic system unless proper safeguards exist for the

imposition of certain economic controls in the event of a grave national emergency'. To address this problem, the Act provided 'means of Executive action' to impose 'price, wage, and rent controls', adding that such controls were 'incompatible with the American free enterprise system' and 'should be invoked only if an emergency arises serious enough to threaten the economic well-being or security of the United States'.

DPA granted the president the power to resurrect the administrative machinery for governing emergencies that had been initially created with the Office of Emergency Management during the Second World War. As Matthew Ruane (2002: 2) notes, this included a 'future oriented authority' through which executive branch offices could prepare for emergencies as well as a range of specific powers to act once an emergency was underway (to ensure 'the timely availability of products, materials, services, and facilities for defense preparedness and national emergency requirements'). Along with two other laws passed in the same year – the Federal Disaster Relief Act and the Federal Civil Defense Act – DPA established permanent authorities that allowed the president to declare and manage national emergencies without congressional approval. These permanent authorities to prepare for and manage potential future emergencies were essential components of the political technology of emergency that consolidated in the Cold War.

Drawing on DPA powers, President Truman declared a national state of emergency in 1950, a declaration that remained in force up until 1976.<sup>14</sup> To manage war production, Truman established the Office of Defense Mobilization (ODM) – discussed in the prior section. Over the next several years, ODM was at the center of political struggles over the extent of the president's emergency powers. During the Korean War, it functioned as a 'super mobilization agency' that oversaw 'every aspect of civilian and military mobilization during the Korean War' (Pierpaoli, 2000: 17). But following a debacle in 1952 in which Truman attempted to nationalize the steel industry under DPA authority (like Roosevelt, he was rebuffed by the Supreme Court) and with the end of the Korean War (and of industrial mobilization for an ongoing war) many instruments for emergency *economic* intervention were stripped away.

Meanwhile, as we saw in the preceding section, with heightening tensions of the Cold War, ODM's mission shifted from industrial mobilization for conventional war to non-military preparedness for a nuclear attack. Thus, the nuclear preparedness apparatus described in the prior section was instituted as part of the legal-administrative machinery designed to govern emergencies within constitutional liberalism. The tools of vital systems security were integral to the functioning of this distinctive American political technology of emergency. Anticipatory techniques such as simulation, the scenario-based exercise, and catastrophe modeling were used to envision the kinds of capacities

that an executive would need in a future crisis. These capacities could be provided in advance through legislative action and administrative planning, thus potentially obviating the need for a state of exception.

#### **IV. Reflexive Biopolitics**

Through the early 1960s, the emergency agencies in the executive branch remained focused on the prospect of nuclear war, although these agencies periodically dealt with other kinds of events such as fluctuations in the price of certain vital commodities (in the case of mobilization authorities) or natural disasters (in the case of civil defense authorities). The concern with non-military defense against nuclear attack peaked by the late 1950s and early 1960s and then gradually receded as ever more powerful nuclear arsenals made non-military efforts to prepare for nuclear war seem futile. But the problem of governing emergencies did not fade away with the decline of nuclear preparedness (Collier and Lakoff, 2008b; Knowles, 2011). Indeed, beginning in the 1960s, the purview of emergency management began to expand. Over the following decades, the knowledge forms and governmental techniques that had been invented to address the exigencies of the Cold War were brought to bear to address other kinds of problems: natural disasters, oil shocks, domestic terrorism, pandemic disease, and cyber-war, to name only a handful. Thus, if vital systems security techniques were initially invented to address problems of sovereign state security – most centrally preparedness for nuclear war – then by the 1970s they were increasingly used to address problems of domestic governance previously managed through apparatuses of population security.

This section focuses on three settings – natural disaster policy, infrastructure protection, and public health – in which governmental techniques for anticipating and managing catastrophic threats that were first developed in the Cold War have migrated to other problem-domains (see Table 2). In part, this migration has taken place within the successors to the federal nuclear preparedness agencies, such as the Office of Emergency Preparedness (1968–73) and the Federal Emergency Management Agency (1979 – present). At the same time, other parts of the Federal Government such as the Department of Treasury, the Department of Health and Human Services, and the Department of Energy have added aspects of emergency management to their existing functions. We will see that, in these various settings, reflexive risk has become a central theme and problem for contemporary government. Experts and policy-makers have identified risks that arise from modernization processes and that cannot be managed through extant (population security) techniques of assessment and mitigation. In response, they have adapted the tools of vital systems security to address problems other than military defense, forging new apparatuses of reflexive biopolitics.

**Table 2.** Reflexive Biopolitics in Three Governmental Domains

Governmental Domain	Population Security Measures	Reflexive Risk	Vital Systems Security Interventions
Natural Disaster Policy	Prevention and relief to provide security in the face of natural disasters	Protective works and relief measures increase losses from catastrophic floods	Catastrophe insurance: catastrophe modeling to understand probable loss from unprecedented natural disasters
Infrastructure Policy	Construction and integration of infrastructures in the name of reliability, welfare, future prosperity	Reliance on infrastructure and network integration creates vulnerability to disruption from multiple kinds of events	Critical infrastructure protection: system vulnerability assessment and vulnerability reduction measures
Public Health	Vaccination and public health measures to manage regularly occurring disease	Increasing circulation of people and drug resistance increases likelihood and effects of new infectious diseases	Pandemic preparedness: scenario-based exercises for preparedness planning

### *Catastrophe Insurance*

First, we consider how the practice of catastrophe modeling, first invented for the purpose of nuclear preparedness, has been taken up to manage the risk of natural disasters. In the US, natural disaster policies traditionally focused either on prevention or on relief payments to victims. The most important examples of such policies were those that addressed catastrophic floods – the largest cause of loss from natural disaster throughout the 20th century. Beginning in the 1930s, the federal government took on vast responsibility for preventing floods through the construction of dams and levees – usually designed to prevent the largest flood on record in a given river basin or coastal area – and for providing relief to victims. But despite mounting government expenditures on protection measures, flood damage (and thus federal expenditures on relief) rose markedly in the ensuing decades.

In the 1960s and 1970s, a group of economists, hydrologists, and geographers concluded that the mounting losses were, at least in part, the *product* of measures taken to provide flood security – in other words, they were ‘reflexive risks’. Protective works blocked off the areas in which flood waters had previously spread, thus exacerbating downstream

flooding. Flood protections encouraged development in flood plains, where residents were safe from small floods, but were exposed to massive and extremely rare floods that overwhelmed dams and levees. Meanwhile, generous federal relief led property and business owners to assume that if a flood did occur they would be bailed out, reducing their incentive to stay out of harm's way. In sum, government measures to increase security had only led to greater losses. As two experts noted, federal flood policy was making things safer on average, but more risky at the extremes (Kunreuther and Slovic, 1978).

In light of this critique of policies focused on relief and protection, policy-makers and experts began to explore means to provide security against catastrophic floods while addressing the problem of reflexive risk. A federal catastrophe insurance program was one such tool. Whereas dams and levees encouraged development in flood plains, and offered residents a false sense of security, insurance would discourage development in the most risky areas by forcing residents to confront (and pay for) the risk of living in a certain location. Advocates of federally-backed flood insurance thus proposed to redeploy a classic mechanism of population security – social insurance – as an instrument of reflexive biopolitics (Collier, 2014).

The problem was that traditional actuarial methods – most centrally risk assessment based on the historical record – could not be applied to catastrophic floods (Collier, 2008). In response, private insurance companies and federal agencies (including the Office of Emergency Preparedness, which drew on techniques previously invented to model nuclear attacks on the US) developed catastrophe models to address at least two significant limitations of traditional actuarial tools. First, due to rapid development in flood plains the 'loss experience' of past floods could not be used to predict possible losses for future floods; as an alternative, catastrophe models could superimpose a 'hazard model' on a changing map of development in a given basin. Second, the historical record was so short (no more than several decades) that it likely did not include truly massive events in any given flood basin; this challenge was addressed by using advanced statistical techniques to simulate a historical record of hundreds or thousands of years.

In the 1970s and 1980s catastrophe modeling for flood insurance was used largely in the National Flood Insurance Program (NFIP), passed into law in 1968; the technical aspects of flood plain mapping and risk assessment were then taken over by FEMA when it was created in 1979. FEMA has continued to be an important center for catastrophe modeling in providing risk maps for NFIP, but this governmental technique has also diffused to other governmental and non-governmental domains. In the early 1990s, for example, following a string of catastrophic hurricanes in the southeast, insurance companies began to employ the services of private catastrophe modeling firms to create loss models for

hurricanes. In recent years, catastrophe insurance has been explored as a tool for governing the risks of other kinds of events that cannot be assessed using traditional actuarial methods, from terrorism to climate change (Bougen, 2003; Ericson and Doyle, 2004).

### *Critical Infrastructure Protection*

Next we consider 'critical infrastructure protection' as another contemporary setting of reflexive biopolitics. As we have described, infrastructures such as transportation and energy systems are long-standing objects of population security, and have also been identified as sources of reflexive risk. Over the 1970s, as techniques of vulnerability assessment and mitigation migrated from nuclear preparedness planning to programs of preparedness for a variety of possible threats (ranging from natural disaster to energy crisis to terrorist attack), critical infrastructure protection became a more general framework for governing modernization risks.

A series of events including domestic sabotage of electrical facilities, the 1973 oil crisis, and the massive 1977 New York City blackout indicated to emergency preparedness planners – a category of expert that, as Knowles (2011) documents, was just emerging at this moment – that the nation's dependence on critical systems was a source of vulnerability to a range of potential threats. In one sense, this concern was not new. As we have seen, national security strategists had long focused on critical nodes of a production system that, if disrupted, could knock out an entire industrial web. There was a crucial difference, however. Vital systems were now understood as vulnerable not only to enemy military attack but also to non-deterrable threats such as terrorism, technological failure and natural disaster. Thus, a 1977 report on civil preparedness by the Joint Committee on Defense Production observed that 'an increasingly complex, technology-dependent, industrial economy in the United States has made citizens more than ever vulnerable to the effects of disasters and emergencies over which they have little or no control and to which they cannot successfully respond as individuals'. In short, system-vulnerability was decoupled from the domain of military strategy (Collier and Lakoff, 2008b). Securing vital systems in the face of various potential disruptions was now a core responsibility for government.

In recent decades, Critical Infrastructure Protection (CIP) has come to be treated as a distinct and coherent domain of federal policy. Early CIP policy focused on cyber-infrastructures, responding to a growing concern regarding information security that developed in the US government during the 1980s and 1990s (Dunn, 2008). But discussions of information infrastructures were soon linked to the longer-standing preoccupation with vulnerability of the nation's vital systems. Following the attacks of September 11, 2001, CIP moved to the center of US domestic security doctrine with the formation of the Department of Homeland Security,



where it is visible in initiatives such as the 'National Strategy for the Protection of Critical Infrastructures and Key Assets' (US Government, 2003). In such strategy statements, the term 'critical infrastructure' refers to technological systems for sustaining social and biological life, often initially developed as part of population security: agriculture and food, public health and healthcare, drinking water and waste water treatment, energy, banking and finance, defense industrial base, telecommunications, chemical, transportation systems, and emergency services.

### *Public Health Preparedness*

A third example of reflexive biopolitics is the adaptation of vital systems security to address the threat of 'emerging infectious disease' over the last two decades. Urban public health agencies, as they developed beginning in the mid-to-late 19th century in Europe and North America, traditionally operated according to the norms of population security. They sought to manage events – outbreaks of contagious disease – whose risk was more or less calculable, given sufficient knowledge of historical patterns of incidence across a given population. Epidemiological surveillance tracked the spread of contagion and mapped its occurrence according to social categories or living conditions (Coleman, 1982). Public health authorities then designed interventions such as mass vaccination or sanitation reform to lessen the collective risk of disease. This practice of risk management remained relatively stable in public health departments up through the 1970s, when it was widely thought that the problem of infectious disease was on the wane, at least in the industrialized world.

Beginning in the late 1980s, however, a group of international health experts began to argue that public health was facing a new and unprecedented threat: the emergence of diseases that had never occurred before, alongside the re-emergence of diseases that had been thought conquered. According to these experts, processes linked to modernization such as deforestation, urbanization and the over-use of antibiotics had altered human-microbe relations, exposing human populations to new pathogens for which they were not adapted. Moreover, the accelerating circulation of people and animals in a globalizing world meant that such pathogens would spread before authorities would be able to identify or contain them. AIDS and drug-resistant tuberculosis were paradigmatic examples. Advocates of this 'emerging disease worldview' (King, 2002) found confirmation in a series of events over the following two decades: sudden outbreaks of diseases like hemorrhagic fever, Ebola, cholera and plague; reports of the spread of bioweapons to rogue nations and bioterrorists; and finally, the appearance of SARS in 2002–3 and a deadly strain of bird flu in 2005 (Collier and Lakoff, 2008c).

For these health experts, existing systems of public health surveillance and intervention, focused on already known diseases, did not lend themselves to managing the uncertain threat of emerging pathogens. They therefore argued for large-scale investment in novel means to rapidly detect and intervene in outbreaks. However, they found that public health authorities, oriented to familiar diseases with well understood patterns of incidence and morbidity, were not readily persuaded to devote resources to emerging diseases. To convince health and national security officials of the need for such measures, pandemic preparedness advocates adopted a technique from the world of nuclear preparedness: the imaginative enactment of a catastrophic future event using scenario-based exercises (Lakoff, 2008). In the absence of an archive of catastrophic disease events, such exercises made it possible to gauge current gaps in preparedness, and to mitigate vulnerabilities in what was conceptualized as the 'public health infrastructure' (which included hospital surge capacity, medical counter-measures, communication among first responders, and so on).

These exercises, along with actual events such as the SARS outbreak, gradually convinced US policy-makers to take measures in anticipation of a novel disease outbreak. A number of 'pandemic preparedness' initiatives were established that employed tools of vital systems security. These included: syndromic disease surveillance programs that, in contrast to classical epidemiological case reporting, could detect the onset of an unanticipated disease event (Fearnley, 2008); the smallpox vaccination program, which sought to immunize first responders against a bioterrorist attack (Rose, 2008); federal investment in biotech to develop drugs and vaccines against anthrax and other 'select agents'; and plans for the smallpox vaccination program in the event of a deadly mutation of the bird flu virus, which included advanced contracts between the US government and drug companies to guarantee an adequate vaccine supply in the case of a deadly outbreak. In the case of the smallpox vaccination program, as in the case of catastrophe insurance, described above, a classic mechanism of population security was adapted to address the problems and aims of vital systems security.

## **Conclusion: Governing Emergencies and the State of Exception**

In conclusion, we consider the implications of our analysis for recent discussions of the government of emergencies in contemporary political life. One influential interpretation draws on Carl Schmitt's famous analysis of sovereignty and the 'state of exception', discussed above. As we have seen, Schmitt argued that constitutional liberalism, with its emphasis on limited executive authority and adherence to legal formalism, was

inherently incapable of responding to rapidly changing situations that required urgent executive (rather than deliberate legislative) action (Huysmans, 2008; Scheuerman, 1999–2000). For some contemporary critics, the Schmittean diagnosis of the limits of liberalism provides a penetrating guide to recent transformations of politics in the United States and elsewhere, particularly in the wake of the attacks of 9/11 (e.g. Agamben, 2005). Such critics analyze measures taken in response to the threat of terrorism – such as the suspension of normal legal procedures in detaining and prosecuting terrorism suspects – as examples of a contemporary state of exception. More broadly, they argue, emergency has become an ever-present condition, and the specter of exception has been woven into all aspects of domestic government (e.g. Martin and Simon, 2008). As Agamben writes, ‘the state of exception tends increasingly to appear as the dominant paradigm of government in contemporary politics’ (Agamben, 2005: 2).

But as Ben Anderson and Peter Adey (2012: 25) have recently pointed out, ‘the “state of emergency” does not exhaust the ways in which emergency is deployed in the governing of life and events’. Indeed, as we have shown, it is crucial to distinguish between the Schmittean state of exception and the government of emergencies through the techniques of vital systems security. In the US, one tradition for the government of emergencies – which can be traced back to constitutional provisions for executive responsibility for war and the suspension of habeas corpus in times of civil unrest – does indeed involve states of sovereign exception in which normal legality is suspended. This tradition has disturbing contemporary manifestations (the treatment of terrorism suspects, and domestic surveillance programs, for example) that are a crucial object of analysis. A second tradition relates to the political technology of emergency that we have been describing. Although these two traditions have intersected at certain times (as, for example, in struggles over Roosevelt’s power to mobilize for the Second World War), more often they have been distinct. The development and recent expansion of domestic emergency management has followed the latter rather than the former pattern. Discussions of the ‘state of exception’, thus, do not fully capture the historical development or contemporary reality of emergency government in the US.

During the Cold War, efforts to establish an administrative machinery for domestic emergency management were the subject of intensive legislative debate and judicial scrutiny. Proposals to expand the executive’s emergency powers or to augment the capabilities of emergency management agencies – whether through increased resources or the creation of a standing federal emergency management force – consistently met constitutional challenges and congressional opposition. As a consequence, federal emergency management has had to rely on small planning staffs that

coordinate the activities of other federal agencies and state or local governments. Thus, the organization for emergency management inherited from the Cold War is often rather under-equipped and provisional – successful under good leadership, prone to disastrous failure under bad. But it hardly threatens the pillars of liberal government (Collier and Lakoff, 2008a; Roberts, 2008). Similarly, the more recent expansion of the purview of emergency management – from economic crisis and war to a range of other potential emergencies such as natural disasters or pandemic outbreaks – has not involved grants of exceptional powers to the executive branch. Disputes about emergency management today tend to focus on a different set of problems: how to best allocate resources or delegate responsibility for the political administration of emergency in the face of an uncertain future.

For critical scholars, then, the central questions about the government of emergencies are questions of technopolitics: what political problems are rendered intelligible within the frame of vital systems security, and what problems are obscured? How are political decisions calculated? And how do the aims of vital systems security relate to other kinds of political goals? For example, a concern with the vulnerability of critical infrastructure may point to the problem of decaying public works. As such, ‘critical infrastructure protection’ policy may involve investments that complement social welfare goals. Meanwhile, a focus on ‘public health infrastructure’ in the name of pandemic preparedness may bolster existing social welfare goals, but may also be in tension with those goals: investments in preparedness for extremely unlikely but potentially catastrophic events may divert resources from already existing public health problems. Finally, federal disaster insurance has led to a new distributional politics of catastrophe: in some areas risk-based premiums may primarily affect affluent residents of expensive oceanfront properties who are repeatedly bailed out by government relief; in other areas, they may disproportionately affect poor residents who have been historically consigned to frequently-flooded low lying areas of cities. In all these domains, new struggles arise over governmental priorities. Long-standing social welfare concerns intersect with new priorities established by the knowledge forms, techniques of assessment, and forms of intervention we have identified with vital systems security. A crucial task for critical scholarship, then, is to investigate how the extension of vital systems security is reshaping the contemporary politics of emergency.

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## Notes

1. By 'diagram of power' we mean an abstract schema through which political problems are defined and technical means of intervention are identified (Deleuze, 1988).
2. For a discussion of such 'topological' analysis, see Collier (2009).
3. See Galison (2001) and Graham (2010) for an analysis of later episodes in which experts recognized that dependence on vital systems was a source of vulnerability.
4. Mitchell (2011: 21–2) notes that the vulnerability of integrated industrial systems was essential for the effectiveness of labor strikes in the early 20th century.
5. The term 'military-industrial complex' – later made famous and given different meaning by President Dwight D. Eisenhower – was coined in 1947 by the government statistician Winfield W. Riefler (1947: 95) to designate the combination of civilian production and military forces required to conduct total war.
6. On ODM's activities during the Korean War see Cuff (1987) and Hogan (2000). ODM's non-military defense activities have received less attention (but see Krugler, 2006).
7. On the continuities between the Second World War and Korean War mobilization see Cuff (1987).
8. More research is needed on the relation between Cold War planners' use of 'resilience' and the later use of the term in systems ecology of the 1970s (Walker and Cooper, 2011).
9. Schmitt noted 'a tendency within twentieth century liberal democracy to equate economic and financial crises with military attacks and armed insurrections, thereby justifying executive recourse to sweeping emergency powers' (Scheuerman, 1999–2000: 1869).
10. Thus Schmitt's famous formulation: 'sovereign is he who decides upon the exception' (see Agamben, 2005).
11. Rossiter's account, which focuses on developments of the late New Deal, should be contrasted with Giorgio Agamben's portrayal of Roosevelt's powers during the early new Deal: 'The New Deal was realized by delegating to the president. . . an unlimited power to regulate and control every aspect of the economic life of the country' (Agamben, 2005: 22).
12. Among other things, the New Deal economists thought such tools for the administration of emergency were necessary to implement Keynesian economic policies.
13. In 2003 these functions were transferred to the newly-created Cabinet-level Department of Homeland Security.
14. In the wake of the Watergate scandal, Congress passed a National Emergencies Act in that year that restricted the circumstances under which a president could invoke emergency powers.

## References

- Adey P and Anderson B (2012) Anticipating emergencies: Technologies of preparedness and the matter of security. *Security Dialogue* 43(2): 99–117.

- Agamben G (2005) *State of Exception*. Chicago: University of Chicago Press.
- Beck U (1992) *Risk Society: Towards a New Modernity*. London: SAGE.
- Beck U (1994) The reinvention of politics: Towards a theory of reflexive modernization. In: *Reflexive Modernization: Politics, Tradition, and Aesthetics in the Modern Social Order*. Stanford, CA: Stanford University Press.
- Biddle T (2002) *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing, 1914–1945*. Princeton, NJ: Princeton University Press.
- Bougen P (2003) Catastrophe risk. *Economy and Society* 32(2): 253–274.
- Brinkley A (1995) *The End of Reform: New Deal Liberalism in Depression and War*. New York: Alfred A. Knopf.
- Coker JD (1949) *Economics of strategic target selection*. PhD dissertation, Graduate Council of the George Washington University.
- Coleman W (1982) *Death is a Social Disease: Public Health and Political Economy in Early Industrial France*. Madison, WI: University of Wisconsin Press.
- Collier SJ (2008) Enacting catastrophe: Preparedness, insurance, budgetary rationalization. *Economy and Society* 37(2): 224–250.
- Collier SJ (2009) Topologies of power: Foucault's analysis of political government beyond 'governmentality'. *Theory, Culture & Society* 26(6): 78–108.
- Collier SJ (2014) Neoliberalism and natural disaster: Insurance as political technology of catastrophe. *Journal of Cultural Economy* 7(3).
- Collier SJ and Lakoff A (2008a) Distributed preparedness: The spatial logic of domestic security in the United States. *Environment and Planning D: Society and Space* 26: 7–28.
- Collier SJ and Lakoff A (2008b) The vulnerability of vital systems: How 'critical infrastructure' became a security problem. In: Dunn M and Kristensen KS (eds) *The Politics of Securing the Homeland: Critical Infrastructure, Risk and Securitisation*. London: Routledge.
- Collier SJ and Lakoff A (2008c) The problem of securing health. In: Lakoff A and Collier SJ (eds) *Biosecurity Interventions: Global Health and Security in Question*. New York: Columbia University Press.
- Cuff R (1987) From the controlled materials plan to the defense materials system, 1942–1953. *Military Affairs* 51(1): 1–6.
- Deleuze G (1988) *Foucault*. Minneapolis: University of Minnesota Press.
- Dunn M (2008) Like a phoenix from the ashes: The reinvention of critical infrastructure protection as distributed security. In: Dunn M and Kristensen KS (eds) *The Politics of Securing the Homeland: Critical Infrastructure, Risk and Securitisation*. London: Routledge.
- Ericson R and Doyle A (2004) Catastrophe risk, insurance, and terrorism. *Economy and Society* 33(2): 135–173.
- Ewald F (1991) Insurance and risk. In: Burchell G, Gordon C and Miller P (eds) *The Foucault Effect: Studies in Governmentality*. Chicago: University of Chicago Press.
- Fairchild M (1939) National economic structure. Air Corps Tactical School Lecture, Maxwell Field, 5 April. Air Force Historical Research Agency, file 168.7001-31.

- Fearnley L (2008) Redesigning syndromic surveillance for biosecurity. In: Lakoff A and Collier SJ (eds) *Biosecurity Interventions: Global Health and Security in Question*. New York: Columbia University Press.
- Fishman R (1997) The regional plan and the transformation of the industrial metropolis. In: Ward D and Zunz O (eds) *The Landscape of Modernity: New York City, 1900–1940*. Baltimore: Johns Hopkins University Press.
- Foucault M (2005) *Hermeneutics of the Subject: Lectures at the Collège de France, 1981–1982*. New York: Palgrave Macmillan.
- Foucault M (2007) *Security, Territory, Population: Lectures at the Collège de France, 1977–78*. New York: Palgrave Macmillan.
- Galison P (2001) War against the center. *Grey Room* 4: 7–33.
- Garrison D (2006) *Bracing for Armageddon: Why Civil Defense Never Worked*. Oxford: Oxford University Press.
- Giddens A (1990) *The Consequences of Modernity*. Stanford, CA: Stanford University Press.
- Graham S (2010) *Cities under Siege: The New Military Urbanism*. London: Verso.
- Guglielmo M (2008) The contribution of economists to military intelligence during World War II. *Journal of Economic History* 68(1): 109–150.
- Hacking I (1990) *The Taming of Chance*. Cambridge: Cambridge University Press.
- Hansell Jr HS (1986) *The Strategic Air War against Germany and Japan: A Memoir*. Washington, DC: Office of Air Force History.
- Hogan MJ (2000) *A Cross of Iron: Harry S Truman and the Origins of the National Security State, 1945–1954*. Cambridge: Cambridge University Press.
- Horton HB (1960–1) Computing hazards of nuclear attack. *Underwater Engineering* 2.
- Huysmans J (2008) The jargon of exception – On Schmitt, Agamben and the absence of political society. *International Political Sociology* 2: 165–183.
- Joint Committee on Defense Production (1977) *Civil Preparedness Review. Part I: Emergency Preparedness and Industrial Mobilization*. Washington, DC: US Government Printing Office.
- Katz B (1989) *Foreign Intelligence: Research and Analysis in the Office of Strategic Services, 1942–1945*. Cambridge, MA: Harvard University Press.
- King NB (2002) Security, disease, commerce: Ideologies of post-colonial global health. *Social Studies of Science* 32(5/6): 763–789.
- Knowles SG (2011) *The Disaster Experts: Mastering Risk in Modern America*. Philadelphia, PA: University of Pennsylvania Press.
- Krugler DF (2006) *This Is Only a Test: How Washington D.C. Prepared for Nuclear War*. New York: Palgrave Macmillan.
- Kunreuther H and Slovic P (1978) Economics, psychology, and protective behavior. *American Economic Review* 68(2): 64–69.
- Lakoff A (2007) Preparing for the next emergency. *Public Culture* 19(2): 247–271.
- Lakoff A (2008) The generic biothreat, or, how we became unprepared. *Cultural Anthropology* 23(3): 399–428.
- Landis ML (1999) Fate, responsibility, and ‘natural’ disaster relief: Narrating the American welfare state. *Law and Society Review* 33(2): 257–318.

- Martin L and Simon S (2008) A formula for disaster: The Department of Homeland Security's virtual ontology. *Space and Polity* 12(3): 281–296.
- McCormick JP (1997) The dilemmas of dictatorship: Carl Schmitt and constitutional emergency powers. *Canadian Journal of Law and Jurisprudence* 10(1): 163–187.
- McReynolds WH (1941) The Office for Emergency Management. *Public Administration Review* 1(2): 131–138.
- Mitchell T (2011) *Carbon Democracy: Political Power in the Age of Oil*. London: Verso.
- Novick D, Anshen M and Truppner WC (1949) *Wartime Production Controls*. New York: Columbia University Press.
- Pierpaoli PG (2000) Truman's other war: The battle for the American homefront, 1950–1953. *OAH Magazine of History* 14(2): 15–19.
- Platt HL (1993) World War I and the birth of American regionalism. *Journal of Policy History* 5(1): 128–152.
- Potts R (1953) National policy and air defense. *Bulletin of the Atomic Scientists* 9(7).
- Riefler WW (1947) Our economic contribution to victory: Turning points in the war. *Foreign Affairs* 26(1): 90–103.
- Roberts PS (2008) Private choices, public harms: The evolution of national disaster organizations in the United States. In: Lakoff A (ed) *Disaster and the Politics of Intervention*. New York: Columbia University Press.
- Roosevelt FD (1939) Message of the President to Congress on Reorganization Plan No. 1 of 1939. Washington, DC.
- Rose DA (2008) How did the smallpox vaccination program come about? Tracing the emergence of recent smallpox vaccination thinking. In: Lakoff A and Collier SJ (eds) *Biosecurity Interventions: Global Health and Security in Question*. New York: Columbia University Press.
- Rose N (1999) *Powers of Freedom: Reframing Political Thought*. Cambridge: Cambridge University Press.
- Rossiter CL (1948) *Constitutional Dictatorship: Crisis Government in Modern Democracies*. Princeton: Princeton University Press.
- Rossiter CL (1949) The constitutional significance of the Executive Office of the President. *The American Political Science Review* 43(6): 1206–1217.
- Ruane M (2002) The Defense Production Act of 1950: Vital Defense and Emergency Acquisition Authority for 2002. Department of the Air Force. Available at: <http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA402217>.
- Scheurman WE (1999–2000) The economic state of emergency. *Cardozo Law Review* 21: 1869–1894.
- Sherman WC (1926) *Air Warfare*. New York: The Ronald Press Co.
- Sherry M (1977) *Preparing for the Next War: American Plans for Postwar Defense*. New Haven: Yale University Press.
- Smith JS (2006) *Building New Deal Liberalism: The Political Economy of Public Works, 1933–1956*. Cambridge: Cambridge University Press.
- United States Government (2003) *The National Strategy for the Protection of Critical Infrastructures and Key Assets, 2003*. Washington, DC: The White House.



- United States House of Representatives Committee on Government Operations, Military Operations Subcommittee (1956) *Civil Defense for National Survival*. Washington, DC: US Government Printing Office.
- Walker S and Cooper M (2011) Genealogies of resilience: From systems ecology to the political economy of crisis adaptation. *Security Dialogue* 42(2): 143–160.
- Yergin D (1990) *Shattered Peace: The Origins of the Cold War*. New York: Penguin.

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