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‘FROM CHAOS TO CONTROLLED DISORDER’

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‘From Chaos to Controlled Disorder’: Syndromic Surveillance, Bioweapons, and the Pathological Future

Lyle Fearnley

> Perhaps the most frightening apparition of our times is the possibility that a biological agent (bacterium, virus, or toxin) will be used to attack our unprotected civilian population and inflict mass casualties.
>
> Barbara F. Bullock
> *The Counterproliferation Papers*,
> Future Warfare Series
> USAF Counterproliferation Center
> February 2002

> A biopower in excess of sovereign right…appears when it becomes technologically and politically possible for man not only to manage life but to make it proliferate, to create living matter, to build the monster, and, ultimately, to build viruses that can not be controlled and that are universally destructive. This formidable extension of biopower…will put it beyond all human sovereignty.
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> Michel Foucault
> “Society Must Be Defended”
> *Lectures at the Collége de France, 1975-76*
> 17 March 1976

Over the last ten years, an emergent public health technology known as syndromic surveillance was requisitioned as an early warning system for bioterrorist attacks on the United States. Specifically, this technology attracted interest and funds earmarked for bioterrorism defense because of a potential ability to rapidly detect unexpected epidemics of disease. The transformation was profound: a small-scale experiment undertaken by New York City public health officials in 1995 has now been implemented in state and federal health departments across the country. Commentators have not hesitated to describe bioterrorism defense as an epochal shift in the institutional formations of the state, heralding a nascent integration of national security and public health. In 2002, President Bush called one syndromic system a “modern DEW line,” referring to the radar shield built over the arctic circle to detect Soviet bombers in the 1950s.1 Syndromic surveillance articulates somewhat awkwardly with this apparent integration, however: the technology was not designed with

[1] Quoted in “NRDM: National Retail Data Monitor: a public health surveillance tool” [online]. Pittsburgh: University of Pittsburgh, Real-time Outbreak and Disease Surveillance (RODS) Laboratory. Accessed from: <http://www.health.pitt.edu/rods>

bioweapons in mind, and questions remain about its utility for national defense against weaponized microbes.2 Rather than an example of incipient integration, I argue that syndromic surveillance re-situates the terms of security and health. The technical innovations developed in syndromic surveillance open up a novel *pathological domain*, that is, a new social geography in which disease is thinkable and visible. By organizing and breaking up the world in new ways, this technical rationality displaces and re-inscribes the populations and territories that underpin the practices of war and health.

Since at least the seventeenth century, surveillance has been an important political technology in the governmental battle with epidemic disease. Put generally, disease surveillance informs about and intervenes in epidemics in order to end them or reduce their harmfulness. Yet the specific mechanisms used to monitor disease have changed, as have their pathological domains. The development of syndromic surveillance during the 1990s was deeply shaped by critiques of then standard surveillance practices. A study commissioned by the Centers for Disease Control (CDC) in 2000 on infectious diseases located two serious weaknesses in standard public health surveillance. The first was its dependence on clinical and laboratory diagnostic reports as sources of health data:

> Provider and laboratory reporting of infectious diseases is incomplete and untimely. Case reporting is a critical foundation for infectious disease surveillance; full participation from the provider community is a necessary component of a functional surveillance system under current data flow arrangements. Estimates of completeness of reporting range from 6% to 90% for many of the commonly notifiable diseases.3

The second weakness was a practice known as categorical reporting. Since the beginning of disease reporting in the nineteenth century, health departments have only mandated reports for those diseases listed as notifiable. The decentralized structure of disease surveillance (and public health generally) in the United States, responsibilities shared among "health care providers; more than 3,000 local health departments…59 state and territorial health departments…public and private laboratories; and…four federal departments,"4 creates multiple and contradictory lists of notifiable diseases. In result, according to the CDC study, "the surveillance infrastructure is

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[2] Arthur Rheingold, "If Syndromic Surveillance Is the Answer, Then What Is the Question?" *Biosecurity and Bioterrorism: Biodefense Strategy, Practice and Science* vol. 1, no. 2 (2003): 77-81.

[3] Raymond Baxter et. al., "Assessing Core Capacity for Infectious Diseases Surveillance: Final Report" *The Lewin Group* (1 November 2000): 17.

[4] GAO, "Emerging infectious diseases: review of state and federal disease surveillance efforts," September 2004.

fragmented and focused on specific disease rather than on the broad range of threats that face a given population."5

Syndromic surveillance, in contrast, monitors "non-specific health indicator data": anything that provides information about health without the *specificity* of a clinical or laboratory diagnosis. From pharmaceutical sales to emergency room triage records to worker absenteeism, syndromic surveillance exploits unconventional data sources in order to bypass diagnostic interpretations. This non-specific health information is then translated into *syndromes*, that is, standardized collections of health symptoms.6 Rather than calculating the number of patients diagnosed with a specific disease (like smallpox), syndromic surveillance calculates the number of syndrome cases (like diarrhea) present in an observed population.

The *subject* of the clinical gaze and the *species* of the laboratory gaze are dissolved into this new pathological domain. In their place, syndromic surveillance organizes novel populations out of pharmaceutical markets and ER databases. These populations are distinct from the sort of population that one belongs to in the sense of a *national* population. These are not societies made up of individuals, but populations in the abstract, statistical sense, formed out of markets and databases.7

Today, syndromic surveillance constitutes these new statistical populations for a single purpose: in order to detect the unusual epidemics associated with bioweapons. As New York City health department statistician Kevin Konty puts it, the syndromic system is still being "tuned" for better bioweapons detection.8 Rather than looking for a known object, the New York City syndromic system is being built to recognize the improbable when it occurs– a flu epidemic out of season, for example. In what I call the expectation of the exceptional, syndromic surveillance has been designed specifically to quickly recognize the epidemic that is out of the ordinary, the epidemic unconstrained by known etiology.9

At stake is a new regime of uncertainty that cuts to the core of contemporary concerns with security. For if syndromic surveillance attempts to recognize the

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5 Baxter, et al, "Assessing Core Capacity," 18.

6 For example, in one coding system the syndrome *diarrheah* translates the symptoms *diarrhea, enteritis, gastroenteritis,* and *stomach virus*

7 cf. Gilles Deleuze, "Postscript on Control Socieites" in Deleuze, *Negotiations* (New York: Columbia University Press, 1995); Francois Ewald, "Insurance and Risk" in Graham Burchell, Colin Gordon, and Peter Miller, eds, *The Foucault Effect* (Chicago: University of Chicago Press, 1991). Ewald refers to the collectivities formed by insurance statistics as "abstract mutualities" distinct from the "qualitative mutualities" of the family, the corporation, the union, and the commune.

8 Interview with Kevin Konty, Statistician, New York City Department of Health and Mental Hygiene, Infectious Disease Monitoring Branch. March 4, 2005.

9 Etiology refers to the natural history or origins of diseases.

unknown, it is only because dreams of perfect knowledge, visions in which epidemic disease could be known and eradicated, no longer seem possible. According to this logic, disease surveillance can no longer hope to ensure or produce order, but instead can only "shorten the time from absolute chaos to controlled disorder."10 Syndromic surveillance has been assigned, within the interstices of public health and national security, to control (not prevent or defend against) the disorders of deliberate epidemics.

Bioweapons

The bioterrorism threat lies beyond the range of both national security and public health practices as they are presently defined. A RAND white paper11 articulates this complexity:

> The scope of bioterrorism is vast. It brings together three distinctive elements (terrorist, biological agent, and living target) that are the responsibility of diverse professional communities, with very different areas of expertise. These communities normally operate independently of one another. During a bioterrorism event these professional communities must find ways to cooperate in mutually beneficial ways, or risk jeopardizing their objectives.12

Defense against the bioterrorism threat, the RAND paper suggests, requires action on three fronts: terrorist, biological agent, living target. While the terrorist remains the responsibility of the national security system, the biological agent and the living target operate outside of the typical national security domain. Locating the enemy becomes highly complex: is it the terrorist, or the biological agent? While the terrorist releases the microbes in the first place, these microbes (particularly if contagious) can continue to wage war long after the terrorist has abandoned the battlefield.

An anthropological description of this site cannot interpret only the actions or beliefs of human participants, but must account for the agency of microbes. As

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10 Robin J. Strongin and C. Stephen Redhead, "Bioterrorism: Public Health Preparedness," in Arthur P. Rogers, ed. *Bioterrorism Reader* (New York: Nova Sciences Publishers, 1993): 84-85. Dr. Roper is Dean of the School of Public Health at the University of North Carolina and was director of the CDC from 1990-93. Dr. Benjamin is Maryland's Secretary of Health and Mental Hygiene.

11 A *white paper* is an offshoot of the term *white book*, referring to an official publication of the national government. From an online description, "A white paper typically argues a specific position or solution to a problem. Although white papers take their roots in governmental policy, they have become a common tool used to introduce technology innovations and products." Available at: http://www.stelzner.com/copy-g-HowTo-whitepapers.php

12 Helga Rippen, "A framework for the Information Infrastructure for Bioterrorism: Results of the 1st Summit" [online] *RAND* (December 2001): 3. Available at: <www.rand.org/scitech/stpi/Infrastructure/Summit1/summary1.pdf>

Bruno Latour argues, the modern division of nature from culture turns a blind eye to the proliferating networks of humans and nonhumans.13 Social analysis typically restricts itself to the beliefs, actions, and power-effects of human beings. However, networks of relations between humans and nonhumans (animals, plants, things) condition and shape human power.14

The so-called *bioweapon* is a particularly powerful hybrid of nature and culture. I use the term bioweapon to refer specifically to the deliberate use of a microbe, virus, or biological toxin as a weapon of war. A bioweapon is in a hybrid class of its own, separated from all other weapons and all other microbes, neither pure nature nor pure non-nature (as in culture, technology, human artifact).15

The modern history of biological weapons begins during the 1930s during the buildup for World War II. Suspicious that Germany and Japan had biological programs, the United States initiated bioweapons research in 1942. George Merck, president of the pharmaceutical firm Merck & Co., oversaw research into weaponized pathogens under the War Research Service. While civilian researchers focused on biological defense, the Army Chemical Corps. built a major laboratory at Camp Detrick, Maryland for offensive research into anthrax, plague, typhus, yellow fever, and other agents. Research tailed off at war's end but picked up again when war began in Korea. By the 1960s, at least seven effective bioweapons had been produced and tested. In 1972, however, mounting criticism led to President Nixon's renunciation of offensive research and the destruction of all stocks.16 Ostensibly defensive research on bioweapons continues to this day in the United States, including at formerly offensive sites such as Camp Detrick.17

Unlike natural microbes, the bioweapon has been conscripted in the circuits of war and politics. The release of a biological agent is therefore unconditioned by its endemic geography, seasonal tendencies, or natural pathogenicity. Take for example the anthrax letters mailed to senators and news desks in October 2001. Anthrax is extremely rare in the United States: the network of scientific labs, angry mailer, and the postal system that assembled that October significantly expanded its territorial range. In material terms, bioweapons are often technologically manipulated. One of the side effects of advances in

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13 Bruno Latour, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, Mass.: Harvard University Press, 1993).

14 Take for example Tim Mitchell's analysis of the Aswan dam, the Nile, and the malarial mosquito and their assemblage in Egyptian national politics. Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002).

15 Of course, the separation of nature from culture is artificial to begin with. See Latour, *We Have Never Been Modern*.

16 Eric Croddy, *Chemical and Biological Warfare: A Comprehensive Survey for the Concerned Citizen* (New York: Copernicus Books, 2002): 226-232.

17 See *The Sunshine Project* website for updated information about contemporary research into biological weapons for defensive purposes. Available at: http://www.sunshine-project.org/

biotechnology over the past two decades is that it is now considered possible to genetically engineer bioweapons for increased pathogenicity or vaccine resistance.18 Even the basic anthrax used in 2001, however, was turned into a fine dust of dry spores in a lab. The resulting bioweapon is certainly not pure nature, but rather a hybrid of human intent and biological material.

As a class of weapon the biological agent is also wholly distinct. Unlike the violent and immediate *impact* of other weapons, the biological agent's attack is invisible and intangible. The victims of a bioweapon incorporate their microbial enemy within themselves in an innocent breath, unaware of their position on a battlefield.

The result of this hybridity is an incredible amount of uncertainty. Ultimately, no one knows exactly what a terrorist attack with a biological agent would look like. As the RAND paper noted, the bioterrorism threat cannot be sufficiently dealt with by the modern institutions of health or defense. It is no longer sufficient to say that the military should deal with enemies and public health with microbes. *For the microbe has become the enemy in the bioweapon*.

Three Genealogies of the Contemporary: National Security, National Health, and the Epidemic Nation

Syndromic surveillance emerged in the interstices and conjunctions of two powerful techno-political apparatuses of the post-WWII state: national security and national health. The bioweapon as a threat to security is widely considered to challenge the separation of these domains. As former Secretary of Health Donna Shalala announced, this contemporary moment is ""the first time in American history in which the public health system has been directly integrated into the national security system."19 This section intervenes in these self-conscious assertions of integration. A genealogy of the contemporary assemblage of public health and national security demonstrates that these techno-political apparatuses are historically contextualized and contingent. Michel Foucault situates the formulation of these domains of knowledge and intervention within the wider transformation of sovereign power from classical absolutism to a rationalized governmentality. Rather than a set of ends or institutions,20 Foucault examines modern warfare and welfare in terms of

18 Laurie Garrett, *Betrayal of Trust: The Collapse of Global Public Health* (New York: Hyperion, 2000): 521-523.

19 Quoted in Hillel W. Cohen, et al, "Bioterrorism initiatives: public health in reverse?" [online] *Am J Public Health*. Available at: <http://www.apha.org/journal/editorials/editcoh.htm>

20 For those in national security institutions, national security is understood to refer to an end or ends: physical security (of territory and people), promotion of values, and economic prosperity, for example. cf. David Jablonsky, "The State of the National Security State," *Parameters*, Winter 2002-3: 4-5.

technologies of power, that is, the mechanisms and rationalities they adopt to further their ends.21

As Foucault hinted, the interface and entwinement of warfare and welfare technologies forms a fundamental locus of modern governmental intervention.22 Rather than distinct in means and ends, the two often operate in conjunction to increase the forces of the state. This conjuncture has taken a number of historical forms, including the application of psychiatry to war trauma, the identification of widespread chronic disease following universal male conscription, and the development of topical medicine in the context of colonial ambitions.23 In short, while the nexus between warfare and welfare technologies remains fundamental to modern governmental power, the *technological form* through which this nexus is exploited has changed over time.

In this section, I adopt Foucault's intellectual maxim (as formulated by Colin Gordon) that "political theory attends too much to institutions, and too little to practices."24 I situate the genealogies of national security and national health institutions in the United States in terms of the rationalities, strategies, and technologies that underpin them. Both institutions assembled techno-strategies into coherent apparatuses towards the end of the Second World War. Both have been called into question by the apparent uncertainty of our contemporary.

National Security

The concept of 'national security' first became a fundamental pillar of US governmentality towards the end of the Second World War. As cuts in military spending loomed at war's end, military planners (along with some civilian supporters) proposed a new understanding of military forces. Rather than rely upon rapid mobilizations following the outbreak of war, these planners argued that it was necessary to permanently prepare for unannounced attacks: what Michael Sherry calls an "ideology of preparedness."25 They argued that the technological developments of the atomic bomb and the long-range bomber rendered obsolete the traditional reliance on oceans for a defense in geographic isolation. Instead, these planners believed that a new era of 'total war' had begun in which "the battle was not confined to the front lines but

21 Michel Foucault, "Security, Territory, Population," in Paul Rabinow, ed., *Ethics: Subjectivity and Truth* (New York: The New Press, 1991): 69.
22 Ibid.
23 Roger Cooter, Mark Harrison, and Steve Sturdy, eds., *Medicine and Modern Warfare* (Atlanta, GA: Rodopi, 1999); John Farley, *Bilharzia: A History of Tropical Medicine* (New York: Cambridge University Press, 1991);
24 Colin Gordon, "Governmental Rationality: An Introduction" in Burchell, et. al., *Foucault Effect*, 4.
25 Michael Sherry, *Preparing For the Next War: American Plans for Postwar Defense, 1941-45* (New Haven: Yale University Press, 1977): 235

extended to the home front as well."26 Rather than demobilization and dismantlement, they argued that a permanent "war machine" was required to enact a policy of active, rather than passive, defense.27

The ideology achieved institutional cohesion with the National Security Act of 1947. The act drastically reorganized the government, establishing the National Security Council as the preeminent advisor to the President on international affairs, transforming wartime intelligence agencies into the permanent Central Intelligence Agency, and uniting the multiple branches of the military into the single Department of Defense. Heavily oriented in budget and agenda towards military and diplomatic concerns throughout the Cold War, the United States became what has been called the national security state.28

During what came to be called the Cold War, the national security state increasingly focused on a single enemy: the Soviet Union. As Colin Gray points out, "the capabilities, declarations, and actions that comprised US national security policy made sense only with reference to the Soviet threat." 29 Although the focus was single, the practice was schizophrenic. On the one hand, a stable, "cold" insecurity developed as diplomatic and military relations between the United States and the Soviet Union achieved balance in the aptly named nuclear strategy of mutual assured destruction (MAD). On the other hand, the United States entered into innumerable wars and skirmishes, most notable and destructive those of Korea and Vietnam.

Despite the obvious inconsistencies and insecurities of the postwar national security state, many commentators now see the period in terms of relative stability.30 With the final collapse of the Soviet Union in 1991, the national security paradigm that perpetually invoked the Communist enemy collapsed as well. Critics from both within and without the military argued that the Cold War behemoth was anachronistic. Demobilization and budget cuts threatened again. As in the late 1940s, planners were forced to predict how future threats would influence defense requirements. Yet no new enemy emerged as a likely threat. Instead, the world appeared to be characterized by incredible uncertainty. In the place of the specific enemy and the known threat, planners focused on a concept and strategy known as asymmetric warfare. According to an Air Force scenario, STRATEGIC FORCE '96:

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26 Michael J. Hogan, *A Cross of Iron: Harry S. Truman and the Origins of the National Security State, 1945-1954* (Cambridge: Cambridge Unversity Press, 1998), 3.
27 Sherry, 201
28 Hogan, 1.
29 Quoted in David Jablonsky, "The state of the national security state", *Parameters* Winter 2002-3, 6.
30 Jablonsky, for example, claims that "The end of the Cold War required the United States to think more deeply about the concept of national security than had been required for two generations." Jablonsky, 10.

> The symmetrical battles have typically pitted steel against steel in slow wars of attrition. Asymmetrical warfare departs from this thinking. Asymmetrical warfare avoids traditional force-on-force battles. Asymmetrical warfare favors pitting your strength against an enemy's strength or weakness in a nontraditional and sometimes unconventional manner.31

In the theory of asymmetric war, the uncertain threat and the unspecified enemy come to be understood as a new paradigm.32 Anthony Cordesman writes:

> What is clear is that homeland defense must respond to a constantly changing threat, especially to the kind that may be impossible to predict, the emergence of new patterns of attack for years to come…[The United States] cannot predict what new threats will or will not emerge, and…grave uncertainties exist regarding the emergence of new methods of attack and defense and the balance of technology between them. The world can evolve in radically different directions and is almost certain to do so.33

Faced with the certainty of uncertainty, the military began (in theory) to prepare for a potentially infinite number of threats.

The theory of asymmetric warfare temporally shifts the hermeneutics of war into an uncertain future rather than an historically determined present. Cordesman writes:

> George Santayana's warning that those who fail to remember the past are condemned to repeat it is as valid as ever, but those who ignore the uncertainty of future change may well face far more serious problems.34

Threat analysis increasingly involves the creation of 'futures scenarios' in order to facilitate predictions of this uncertain future. These scenarios range from text-based narratives of global political change to computerized role-plays of

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31 Lloyd Matthews, ed. *Challenging the United States Symmetrically and Asymmetrically: Can the United States be Defeated?* (Carlisle Barracks, Pa.] : Strategic Studies Institute, U.S. Army War College, 1998).

32 cf. Gilles Deleuze and Félix Guatarri, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987): 420-422 for analysis of the conceptual category of the 'enemy' as well as the 'unspecified enemy'.

33 Anthony Cordesman, *Terrorism, Asymmetric Warfare, and Weapons of Mass Destruction* (Westport, Conn.: Center for Strategic and International Studies, 2002): 9.

34 Ibid.

terrorist attacks.35 As these scripted scenarios reveal, what *is* certain for security planners is the vulnerability of the United States to asymmetric or non-conventional attacks: in particular, attacks that target the civilian population.

In recent years, national security has been reformulated into the concept and strategy of *homeland* security. Homeland security applies the theory of asymmetric warfare to expand the ideology of preparedness to encompass all of society.36 Ultimately, the enemy is not only left unspecified but displaced as the primary locus of concern. The possibility of endless insecurity is suggested. In his introductory letter to the *National Strategy for Homeland Security*, President Bush writes:

> We are today a Nation at risk to a new and changing threat. The terrorist threat to America takes many forms, has many places to hide, and is often invisible. Yet the need for homeland security is not tied solely to today's terrorist threat. The need for homeland security is tied to our *enduring vulnerability*.37

National Health

Today, the federal government's involvement in the health of the national population seems self-evident. The FY2005 budget of the Department of Health and Human Services, to note only one statistic, topped $539 billion dollars.38 Yet before the Second World War, the federal government did not address public health or disease at the level of the national population in a consistent or coherent manner. City and state departments that focused only on their local areas dominated the practice of public health.

The Marine Hospital Service, created in 1870, was the first federal institution to exclusively and permanently address health. However, its focus was localized, only involved with the care and relief of sick and injured merchant seamen. Within years, the responsibilities of the Hospital Service expanded into a more general control of infectious disease in the ports. The National Quarantine Act of 1878 subsequently conferred quarantine authority on the Service. At this

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35 cf. National Intelligence Council, *Mapping the Global Future: Report of the National Intelligence Council's 2020 Project* (December 2004). Available at: <http://www.cia.gov/nic/NIC_globaltrend2020.html>; *Dark Winter*. Available at: <http://www.homelandsecurity.org/darkwinter/index.cfm>.

36 Homeland security is "an exceedingly complex mission that requires coordinated and focused effort from our entire society–the federal government, state and local governments, the private sector, and the American people. *National Strategy for Homeland Security* (Washington, D.C.: Office of Homeland Security, 2002): vii.

37 George W. Bush, Cover letter to *National Strategy for Homeland Security* [emphasis added].

38 United States Department of Health and Human Services, *Budget in Brief: FY2005* (Washington, DC: Health and Human Services, 2005) [online]. Accessed from: <http://www.hhs.gov/budget/docbudget.htm>

time, disease was considered a threat to the national body, but only at the territorial orifices: ports. As immigration increased in the late nineteenth century, fears of contaminated boundaries abounded, often targeting newcomers as the cause of disease epidemics.39 In 1889, the responsibilities of the Service were formulated in terms of national defense. The organization became a commissioned corps, meaning that it is one of the uniformed services of the U.S. military.

In 1902, the organization changed its name to the Public Health and Marine Service; in 1912, it became just the Public Health Service. The roles and responsibilities of the Service were expanding; yet it remained a subsidiary of the Treasury Department with no mandate to broadly address the health of the population. Things began to change during the Second World War. A small organization was formed under the auspices of the Public Health Service exclusively to fight malaria near domestic military bases. As the war came to a close, the staff of Malaria Control in War Areas (MCWA) began thinking about their role in the postwar peace. Joseph Mountin, MCWA director, was particularly interested in "getting the PHS [Public Health Service] into domestic health problems in the states."40 Mountin wrote in a January 1942 memo that "the defense emergency could result in an improvement in civilian health; that after the war, services having to do with the general population could be developed."41

In 1946, the foundation of the Communicable Disease Center (CDC– now Centers for Disease Control) transformed the MCWA into a field station of the Bureau of State Services engaged exclusively in practical public health affairs. The Bureau linked the states with the Public Health Service and the foundation of the CDC was one important step in developing public health at the national level.

Seven years later, the health of the national population would become institutionalized as a fundamental object of U.S. governmentality. In his foundational and influential work *A History of Public Health* [1958], George Rosen identifies the formation of the U.S. Department of Health, Education and Welfare in 1953 as a point of historical culmination. For the first time, the U.S. had a truly national health agency, one fitting "the modern conception that the national government is responsible for the health of the people."42 For the first time, a coherent apparatus linked the health of the national population to the national government.

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39 Nick King, "The influence of anxiety: September 11, Bioterrorism, and American Public Health," *Journal of the History of Medicine* vol. 58, (October 2003): 434.
40 Quoted in Melissa Etheridge, *Sentinel for Health* (Berkeley: University of California Press, 1992): 16.
41 Ibid.
42 George Rosen, *A History of Public Health* (New York: MD Publications, 1958): 468.

During the 1970s, some commentators expanded Rosen's teleology of national health into a sort of 'end of history' narrative heralding the end of infectious disease as a threat to man and nation.43 These hopes didn't last long. Cutbacks in public health funding, expanding social inequality, and increases in global trade and travel combined to threaten the United States (along with many other places worldwide) with health disaster during the 1990s. Laurie Garret uses the term collapse to describe the repeated failures, shortcomings, and general disarray in the U.S. public health system.44

While the national security challenges of the 1990s consolidated around the theory and strategy of asymmetry, public health problems were increasingly collected under the rubric of *emerging infections*. Emergence has been used to characterize a number of different public health threats: viral diseases that have *emerged* from a natural reservoirs, such as HIV or SARS; the re-*emergence* of infectious diseases previously thought under control, such as diphtheria in Eastern Europe; the *emergence* of bacteria resistant to multiple antibiotics after the over-prescription of these drugs, such as multi-drug resistant tuberculosis; and, most tellingly, the *emergence* of infectious diseases previously unknown in the developed world, such as West Nile viral encephalitis.45

The concept of emergence, like that of asymmetry, transforms the temporality of knowledge and action. George Rosen's concept of a modern, national health was built on a belief that a complete knowledge of disease was possible and a committed application of this knowledge could solve health problems. He writes:

> Today [1958], the community is in a better position than ever before to control its environment and so to preserve health and avert disease. More and more, man can consciously plan and organize his campaign for better health because available knowledge and resources make it possible for him in many instances to act with a clear understanding of what he is doing.46

The optimism that postulates a perfect knowledge of the problem is exactly what is considered lacking in the case of emerging infections. An emergent epidemic is new, unusual, and unpredictable. Extant vaccines will not deflect them, nor will immunological antibodies protect new host populations. Perhaps the only thing certain about emerging infections is the likelihood that more will emerge. Stephen S. Morse argues that the rate of emergence is

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43 William McNeill, *Plagues and Peoples* (Garden City, NY: Doubleday, 1976).
44 Laurie Garrett, *Betrayal of Trust: The Collapse of Global Public Health* (New York: Hyperion, 2000).
45 Stephen S. Morse, "Factors in the Emergence of Infectious Disease" *Emerging Infectious Diseases* vol. 1, no. 1, (January-March 1995): 7-15. See also more generally Morse, ed., *Emerging Viruses* (New York: Oxford University Press, 1993).
46 Rosen, 495.

"accelerating,,"47 and Christopher Chyba anticipates "that more "new" diseases will appear or take hold in the human population."48

"The apparition of our times": The emergence of the bioterrorism threat

During the late 1990s, the recently destabilized apparatuses of national security and public health were both challenged by a single danger: biological terrorism. The stimulus that brought the threat to public discourse was another historical conjuncture. In the early years of the decade, defectors revealed that the Soviet Union had concealed a secret biowarfare program long after ratifying the Biological Weapons Convention in 1972.49 Scientists had continued research into the 1980s on smallpox, anthrax, and other agents in an ostensibly civilian biological research institute known as Biopreperat. The contemporary whereabouts of researchers, labs, or materials (including live microbial cultures) were poorly known. Those with access to these classified discussions feared that weapons expertise or biological weapons could have leaked through the increasingly porous borders of the post-Soviet Republics.50

The first responses to the biological terrorism threat came from within the national security apparatus. Bioweapons were lumped with nuclear and chemical weapons as a problem of proliferation. An emergency directive given by President Clinton best exemplifies the nonproliferation battle. In 1994, Clinton declared a national emergency "in light of the dangers of the proliferation of nuclear, biological, and chemical weapons ("weapons of mass destruction") and of the means of delivering such weapons." The directive argued for strengthened international agreements and sanctions against proliferators.51

Within a few years, however, some national security experts hinted that the bioweapons problem was beyond their reach. The particular hybrid character of the bioweapon required what Christopher Chyba calls a "strategy of public

47 Morse, "Factors in the Emergence," 7.
48 Christopher F. Chyba, "Biological Terrorism, Emerging Diseases, and National Security" [online] *Project on World Security*, New York: Rockefeller Brothers Fund, (1998). Available at: http://www.rbf.org/pdf/Chyba_Bioterrorism.pdf
49 The 1972 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (the "1972 Biological Weapons Convention") prohibits the production, testing, and stockpiling of biological weapons.
50 Garrett, 481-494.
51 William J. Clinton, "Presidential Letter to Congress on Non-Proliferation Activities" [online] *Clinton Foundation* [18 May, 1995Available at: http://www.clintonfoundation.org/legacy/051895-presidential-letter-to-congress-on-non-proliferation-activities.htm

health surveillance" unique among defense technologies.52 The bridge between the classified space of national security knowledge and the public health community was built by a single man: D.A. Henderson. Henderson is an epidemiologist renowned for his leadership in the global eradication of smallpox that also has a security clearance. Knowledgeable about biological weapons and their proliferation, he went public in a March 1998 speech to the first International Conference on Emerging and Infectious Diseases. Henderson began,

> Until recently the subject of biological terrorism has been little discussed or written about in the medical literature or, for that matter, in the public press.

And then, the moment of revelation:

> We now know that there are nations and dissident groups who have both the motivation and access to skills to selectively cultivate some of the most dangerous pathogens and to deploy them in acts of terrorism or war.53

Deploying the language of asymmetric warfare, Henderson argued that the biological weapons threat is a novel concern for public health. Yet fifty years earlier, in what I have described as the formative moment for both the national security state and the national health apparatus, none other than his teacher and mentor made public a nearly identical bioweapons problematic.

Alexander Languimir and the Surveillance of the Epidemic Nation

Alexander Languimir navigated the intertwined worlds of war and health during the 1940s as these techno-political domains were consolidated in the apparatuses of national security and national health. In particular, he brought the two domains together through his theorization of biological warfare. He articulated a public health responsibility for biological warfare defense embodied in the organization he called the Epidemic Intelligence Service (EIS). The methods pioneered by this organization ultimately became a model for general public health practice worldwide, most famously during the global eradication of smallpox led by D.A. Henderson (himself a member of the EIS). Languimir's key contribution to public health practice was a method of epidemiological surveillance that followed every instance of a disease within the territorial space of the nation state, organizing what I call a 'nation of epidemics'. Ironically, perhaps, it is this nation and the related methods of surveillance that are critiqued within the contemporary bioweapons discourse.

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52 Christopher Chyba, "Biological Terrorism, Emerging Diseases, and National Security," *Project on World Security: Rockefeller Brothers Fund* (1998): 8.
53 Quoted in Garrett, 488-489.

Languimir graduated with a Master's in Public Health from Johns Hopkins in 1940. He immediately began public health practice at the New York State Institute of Health. As the United States entered World War II in 1942, Languimir accepted a post as epidemiologist for the Commission on Acute Respiratory Diseases at Fort Bragg, NC. 54

When the war ended, he returned to Johns Hopkins as an associate professor of epidemiology. At Hopkins, he became close friends with professor of bacteriology and epidemiology Kenneth Maxcy. Along with his academic duties, Maxcy served on the Committee on Biological Warfare. The highly classified committee, created in 1941, developed the U.S. program and policy for biological warfare. As friend and fellow epidemiologist, Languimir often filled in for Maxcy on the committee. When Macxy fell ill with Parkinson's disease, Languimir rook over full time. As early as 1947, Languimir also served on the Army Chemical Corps' Administrative Council, the organization involved in offensive biological weapons research. By 1949, he had a higher security clearance than the surgeon general and firsthand expertise with biological weapons.55

In that year, he was appointed Chief Epidemiologist at the CDC, only recently emerged from the war-era organization Malaria Control in War Areas. The organization had no clear mandate and no secure footing within the state bureaucracy. Languimir quickly brought up the spectre of biological warfare as a problematic that needed to be addressed by public health and, more specifically, with epidemiological methods. In October, 1949 he told a meeting of state health officials that the food and water supplies were particularly vulnerable to biological attack.56

Two months later, the National Security Resources Board declared that civil defense planning must account for all types of enemy attack, including biological warfare. Languimir developed the CDC's technical response to the biological weapons threat at a meeting of the Public Health Service in July 1950. While Truman geared up for war in Korea, biological warfare dominated the conference. In particular, the problem of detecting an unannounced bioweapons attack focused concern. As Languimir later reported, there was "common agreement [at the meeting] that the basic need was for the development of strong epidemiological investigation of all types of epidemics occurring anywhere in the nation."57

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54 "Alexander Languimir–A Brief Biographical Sketch" *American Journal of Epidemiology* vol. 144, no. 8, suppl. (1996): S1.
55 Elizabeth Fee and Theodore M. Brown, "Preemptive Biopreparedness: Can we learn anything from history?" *Am J Public Health* vol. 91, no. 5, May 2001:721-722.
56 Etheridge, 36.
57 Etheridge, 42.

Out of the meeting came a new division within the CDC which Languimir called the Epidemic Intelligence Service. EIS recruits were members of the Public Health Service commissioned corps. Each recruit served a two-year, active duty epidemiological assignment under the direction of Languimir. They simultaneously studied theory in specially designed courses with Johns Hopkins public health professors and actively investigated real epidemics. Upon completion of the two-year assignment, the graduates continued to be on reserve for emergency call-up by the EIS.58 The EIS investigated every potential epidemic reported by physicians upon request from the states. In order to detect and defend against a deliberate epidemic, every epidemic had to be characterized and controlled.

Out of the EIS grew two conceptualizations that Languimir fleshed out in subsequent articles. The first was what he called a "logical statement of a 'theory of biological warfare.'" 59 In a *Public Health Reports* article entitled "The potentialities of biological warfare against man" [1951], Languimir attempted to scientifically justify the participation of public health in national defense by defining biological warfare in terms of "experimental observations and rationally organized epidemiological principles." He wrote, "if only a small area could be defined to which all professionally qualified persons could agree, this would form the basis for such a theory."60

To do so, he begins with the claims made by the recently published Executive Office document "Health Services and Special Weapons Defense" that speculate on methods of biological attack. According to the document, there are two: "the creation of clouds of pathogenic aerosols over cities"; and "the contamination of our water or food supplies."61 After a lengthy theoretical discussion, Languimir concluded, "the epidemiology of airborne infection and of common vehicle [i.e., food and water supplies] epidemics forms the basis for developing a theory of biological warfare."62 Rather than medicine or laboratory biology, Languimir argued that epidemiology and public health were the tools for understanding biological warfare.

In relation to this theory, Languimir articulated and defined what has recently been called the modern definition of public health surveillance.63 Languimir argued that the term surveillance was "not new to public health" but that he

58 Alexander Languimir, "The Epidemic Intelligence Service of the Center for Disease Control," *Public Health Reports* vol. 95, no. 5, (September-October 1980): 470-477.
59 Alexander Languimir, "Potentialities of biological warfare," *Public Health Reports* vol. 66, no. 13, (30 March 1951): 387.
60 Ibid.
61 Ibid.: 388
62 Ibid.: 397.
63 Baxter, et. al., "Assessing Core Capacity," 8.

used the concept differently.64 Earlier, pubic health surveillance had typically been "applied to individuals rather than diseases." This meant the close observation of individuals "in order to detect the early signs of sickness without restricting . . . freedom of movement." Focused on the individual, such a regime of surveillance was only feasible within confined spaces or under emergency conditions. In contrast, surveillance of *disease* is the "continued watchfulness over the distribution and trends of incidence through systematic collection, consolidation and evaluation of morbidity and mortality data and other relevant data."65 The data that could be collected within this new regime of surveillance included diagnosis and laboratory evidence, as well as the age, sex, ethnicity and place of residence of the patient.66

Surveillance was shifted from the examination of disease in an individual to the incidence or rate of disease in a population. Underlying this technical method of surveillance is a particular philosophy of disease. The EIS was based on the theory that:

> Infectious disease exists because neither the host nor the parasite can destroy the other. They have achieved an unstable biological balance. Epidemiology is concerned with the factors that cause this balance to fluctuate, the object being to provide a scientific basis for altering those trends in favor of man.67

Understanding this balance, and the potential for imbalance in favor of either man or disease, required an understanding of the regularities of disease in the population. Languimir from the beginning of his time at the CDC emphasized the importance of consistent and consolidated morbidity and mortality reporting. By 1963, his efforts transferred the collection of these reports from the Office of Vital Statistics to the CDC, greatly expanding the detail of surveillance.

Languimir organized what I call a nation of epidemics, that is, a national space in which every epidemic was watched and monitored. The EIS technology opened up a new pathological domain in which disease was defined in terms of the nation and the national population. For the first time, every epidemic in the nation was made visible and placed under careful surveillance. The regularities of illness and death for the national population were also consolidated and statistically analyzed for the first time.

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64 Alexander Languimir, "The Surveillance of Communicable Diseases of National Importance," *N Engl J Med* vol. 268, no. 4, (24 Jan 1963): 182.
65 Ibid.: 182-183.
66 F. Fenner, D.A. Henderson, et. al., *Smallpox and its Eradication* (WHO/OMS, 2001). Accessed online from: <http://www.who.int/emc/diseases/smallpox/Smallpoxeradication.html>
67 Etheridge, 32.

Languimir's theory and practice of disease surveillance spread to public health organizations worldwide. During the 1960s, the World Health Organization endorsed Languimir's disease surveillance as a key public health strategy. The Technical Discussions of the World Health Assembly in 1968 focused entirely on disease surveillance, addressing it as an already widely established and essential public health practice.68 During the 1970s, D.A. Henderson (a former member of the Epidemic Intelligence Service) was appointed to lead the WHO effort to globally eradicate smallpox. As Henderson notes in an article on the subject, many scientists at the time were skeptical about the possibility of global eradication. Unfazed, Henderson argued that a vociferous surveillance program could ensure "that the number of smallpox cases reaches '0'."69 After ten years of vaccination and surveillance, smallpox was eliminated, forming the high point in the dream of a global 'end of epidemics'.

Ironically, perhaps, Henderson himself has been pivotal in raising the spectre of bioterrorism and criticizing existing surveillance measures. As director of the Hopkins Center for Civilian Biodefense Studies founded in 1998, Henderson led the call for innovative improvements in disease surveillance. The call for more surveillance reflects a continuity with Languimir's postulation of a visible epidemic nation. However, the epidemic threat has lost its certitude and surveillance technology has subsequently mutated. The application of surveillance to smallpox during the eradication program had a known object: cases of smallpox. The goal of the program was to discover the peculiar regularities of disease transmission in order to improve the efficiencies of vaccination programs. For example, in 1967 one investigator in Nigeria discovered that the spread of smallpox could be interrupted through highly targeted, containment vaccination rather than mass vaccination of entire populations.70 Surveillance for bioterrorism (and in particular syndromic surveillance technologies) operate with a fundamentally different logic. Rather than epidemiological characterization of a known target, bioterrorism surveillance emphasizes the rapid recognition of the unknown. As the 2000 CDC study of the surveillance infrastructure argued, "strong surveillance is needed to identify these events at the earliest sign in order to trigger an immediate response."71

68 Alexander Languimir, "Evolution of the Concept of Surveillance in the United States," *Proc. Roy. Soc. Med.* vol. 64, (June 1971): 681-684.
69 Quoted in D.A. Henderson, "Smallpox Eradication," *Public Health Reports* vol. 95, no. 5, (September-October 1980): 425.
70 Henderson, "Smallpox Eradication," 426.
71 Baxter, et. al., 19.

Syndromic Surveillance: A New Pathological Domain

In the past ten years, the experimental syndromic surveillance system implemented by the New York City public health department has become a model for an emerging defense apparatus. Out of a contingent response to the failures of traditional disease surveillance has emerged a technique that attracts "widespread interest" for its potential ability "to detect a large-scale bioterrorist attack in its early stages."72 The result has been what two New York City health officials describe as a "flood of interest and funding" as "a surveillance methodology virtually unknown just a few years ago is now poised for deployment across the nation."73

The story begins inconspicuously with the kind of epidemic that historically has frequently problematized the techno-political governance of populations.74 In 1993, an epidemic of diarrheal *Crypto spordium* in Milwaukee that sickened over four thousand people went undetected by public health disease surveillance. A pharmacist who noticed large sales of over the counter anti-diarrheal drugs was the first to sound an alarm, and the local media publicly reported the epidemic days before the health department took action.75 The failure embarrassed and frightened public health officials across the country. According to Ronald Glasser, the Milwaukee outbreak was widely seen as "a clear sign that our infectious-disease and medical surveillance and prevention programs were no longer working."76

Two years later, the New York City public health department77 (NYCDH) implemented the first prospective surveillance system for so-called 'non-specific health indicator data': loosely, symptoms or syndromes rather than diagnoses. With Milwaukee's experience in mind, the system was designed to detect a large epidemic of diarrheal disease in its early stages. Rather than heightening the sensitivity of the traditional surveillance system, perhaps by enhancing the vigilance of clinicians and laboratories for cases of *Crypto*, this syndromic technique collected data on diarrheal illness that disregarded diagnosis entirely. Each of the three data sources under surveillance–cases of diarrheal illness at sentinel nursing homes; cases of diarrheal stool submissions at labs; and sales of over the counter anti-diarrheal drugs–tabulated cases of

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72 Richard Heffernan, et al, "Syndromic Surveillance in Public Health Practice, New York City" *Emerging Infectious Diseases* vol. 10, no. 5, (May 2004): 858.

73 Farzad Mostashari and Jessica Hartman, "Syndromic Surveillance: A Local Perspective," *Journal of Urban Health* vol. 80, no. 2, suppl. 1 (2003): i1.

74 cf. Paul Rabinow's discussion of cholera in France. Rabinow, *French Modern: Norms and Forms of the Social Environment* (Chicago: University of Chicago Press, 1995).

75 Ronald J. Glasser, "We are not immune: influenza, SARS and the collapse of public health," *Harper's* (July 2004):

76 Ibid.

77 New York City Department of Health and Mental Hygiene.

diarrhea rather than the specific causative species.78 Disease surveillance as established by Languimir had emphasized investigating known epidemics in progress. This diarrheal syndromic system, on the other hand, routinely collected health information in order to detect the emergence of an epidemic in its early stages.

Three years later, in 1998, a conjuncture of two factors radically transformed the horizons of the experimental system. The first was the emergence of bioterrorism as a problem for public health. D.A. Henderson gave his definitive speech to the International Conference on Emerging and Infectious Diseases about the imminent bioterrorism threat that year; New York City quickly emerged as a likely site for such attacks. In collaboration with the Fire Department, NYCDH began monitoring 911 emergency calls for "indicators of biological terrorism."79

Secondly, the new system shifted from a paper-based to an electronic reporting system. Emergency calls are routinely entered into an electronic database in order to facilitate ambulance dispatch.80 By mining a database that already existed in electronic form, the surveillance system only needed to reroute information to the health department. Initially, data was manually forwarded by e-mail every day; later, an automatic transmission mechanism was developed that delivered batches of call data to the health department multiple times a day.81 This approach towards real-time data collection remains one of the most exciting attributes of syndromic surveillance for its proponents.82

The consolidation of this interest into a focused and funded plan for national defense occurred in the aftermath of "9/11."83 The date did not mark an epochal transition: rather, technologies and discourses set in motion long before broke the surface of public and political awareness.84 Along with enhanced passive reporting, New York City public health built a third syndromic surveillance system within one day of the attacks because of concern about possible bioterrorism.85 Implemented in fifteen sentinel hospitals, the system

78 Richard Heffernan, et al, "System Descriptions: New York City Syndromic Surveillance Systems" *Morbidity and Mortality Weekly* 53 Suppl. (24 September 2004): 24.
79 Ibid.
80 Ibid.
81 Melanie Bescuildes, NYCDH, "Negotiating with data providers: examples," presentation on Data Transfer and Transformation at the 2003 National Conference on Syndromic Surveillance. Available at <http://www.syndromic.org/work.html>
82 Heffernan, et al, "Syndromic surveillance in public health practice."
83 Mostashari and Hartman, "Syndromic Surveillance: A local perspective," i1.
84 For calls to situate 'biodefense' technologies within a longer history, see especially King, "The influence of anxiety"; and Andrew Lakoff, Stephen Collier, and Paul Rabinow, "Biosecurity: Towards an Anthropology of the Contemporary" *Anthropology Today* vol. 20, no. 5 (October 2004).
85 Debjani Das, et al, "Enhanced drop-in syndromic surveillance in New York City following September 11, 2001," *Journal of Urban Health* vol.. 80, no. 2, Suppl. 1, (2003): i76.

collected data on every patient that visited the emergency department twenty-four hours a day. In its early stages, Epidemic Intelligence Service Officers (EISOs) directed by the CDC assisted physicians and nurses in completing one-page forms on patient syndromes. To facilitate completing forms, EISOs educated, verbally encouraged, and provided incentives such as food and candy to nurses and physicians. The EISOs, equipped with laptop computers and two-way radios, entered this information into databases from which a citywide data set was created at the end of the day.86

Manual data collection continued for two months on an emergency footing. However, an EISO survey revealed that manual collection caused delays and inconsistencies. The system was also costly in terms of human work hours.87 In November, the syndromic surveillance of ER visits shifted to an electronic network utilizing e-mail or automatic file transfer and the EIS workers left. The transition between two surveillance regimes could not be clearer. The program began as an emergency response enacted by the Epidemic Intelligence Service, but it became a routine biodefense surveillance program. Disease surveillance went from an emergency to a routine practice.

While New York City health officials acknowledged that the system was no substitute for clinicians with "a high index of suspicion," and the only bioterrorist attack that occurred (the anthrax mailings) was too small-scale to be detected, syndromic surveillance had burst onto the national scene.88 On September 23rd and 24th, 2002 the NYCDH and the New York Academy of Medicine hosted the first National Conference on Syndromic Surveillance in New York City with the assistance of a bioterrorism grant from the Sloan Foundation.89 Over four hundred public health practitioners, computer scientists, physicians, lawyers, and statisticians attended the conference from a global array of government, industry and military institutions. Over fifty presentations addressed topics ranging from the legal basis for syndromic systems, potential standards for system evaluation and data transmission, and nontraditional data sources.

In short, the event brought a lot of technical expertise into a single area in order to consolidate syndromic surveillance as a technology. As an online summary of the conference puts it,

> this timely and important conference provided a forum for participants to define the rapidly evolving science of syndromic surveillance, review and evaluate existing systems and discuss

86 Ibid.
87 Ibid., i86.
88 Ibid., i86-87.
89 cf. *Alfred P. Sloan Foundation*. Accessed from:
<http://www.sloan.org/programs/pg_national.shtml#bioterror>

> methodologies, opportunities and challenges in this emerging field. 90

Along with its technical consolidation, the conference fleshed out connections between the emerging technology and the techno-political apparatuses of the state Two of the opening talks built structural links between syndromic surveillance and the dual realms of public health and national security. Margaret Hamburg of the Nuclear Threat Initiative91 spoke on 'Putting Syndromic Surveillance in Context (National Preparedness)'; while Michael T. Osterholm, a public health practitioner from Minnesota spoke on "Putting Syndromic Surveillance in Context (Public Health)'.92

A second conference the next year encouraged the spread of syndromic surveillance to public health practice across the country. Using the New York City syndromic systems as an exemplary model, the conference centered on a three-day workshop for state and local public health practitioners interested in developing their own syndromic surveillance.93 Today most states and four federal agencies operate at least one syndromic surveillance system. Notable among the federal programs are the ESSENCE system built by the Department of Defense and the BioSense system built by the CDC. A few systems are emerging that are nationwide in scope. Both BioSense and the Pittsburgh developed National Retail Data Monitor utilize pharmaceutical sales information from major national retail chains.94 Slowly and not necessarily directly, the pathological domain under syndromic surveillance has expanded. Beginning with a single experimental system, expanding to address bioterrorism, and finally taking in a national domain, the process has involved hesitant articulations with both public health and national security institutions. At stake in this expansion is a fundamental shift in the use of disease surveillance. In Languimir's model, disease surveillance had been an investigative procedure modeled on the methods of the crime sleuth. The epidemic problem was known: the problem was figuring out what had caused it. Syndromic surveillance, on the other hand, makes no active attempt to characterize or describe epidemics. Instead, it only attempts to detect them and does so through the routine collection of data.

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90 Accessed from: http://www.syndromic.org/con_2002.html Nearly complete records of the conference can be found at this address.

91 The Nuclear Threat Initiative is a Washington, D.C. based policy think tank founded in January, 2001 by Ted Turner and Sam Nunn. The NTI's mission is "to strengthen global security by reducing the risk of use and preventing the spread of nuclear, biological and chemical weapons. NTI seeks to raise public awareness, serve as a catalyst for new thinking and take direct action to reduce these threats." Accessed from http://www.nti.org/b_aboutnti/b_index.html

92 Available from: htto://www.syndromic.org

93 For nearly complete records of the workshop see <htto://www.syndromic.org/work.html>

94 Government Accountability Office, "Emerging Infectious Diseases: Review of State and Federal Disease Surveillance Efforts" (Washington, DC: GAO, September 2004).

Displacing the Clinical Diagnosis: The New Epidemic Registers

The transformation of human disease into knowledge or meaning is an unstable and historically determined interpretive practice. The foundations of the clinic, and its particular diagnostic relationship between doctor and patient, are not so old. In the seventeenth century, the cause of disease was determined through two techniques in conversation: the ill person's vocalized description of symptoms; and the physician's visual analysis of bodily 'signs.' The developments of anatomy in the early nineteenth century and, later, a number of machinic visual aids, gave increasing precedent to the physician's interpretation (often of mechanical readouts) over the expressive speech of the sick.95 Foucault describes this as the 'anatamo-clinical' method in which the anatomy of the corpse is "embodied in the *living bodies* of individuals."96 Diagnosis is practice of subjectification in which patients come to know themselves as individual living beings (*subjects*, in Foucault's terms) through the interpretive examination of the doctor.

Traditional surveillance depends on diagnostic reports. The clinical diagnosis is at the heart of its assumptions about disease, though these reports are collected into a population. The technology of syndromic surveillance reveals dramatically different assumptions about the status of the sick, the space of the clinic, and knowledge of disease. The distrust of the clinical diagnosis in the face of the unexpected epidemic leads to a revaluation of the ill person's understanding of what is wrong with themselves. Through the patient's vocalized complaints or their consumption of pharmaceuticals, a new image of disease emerges for interpretation. Yet this is not a conversation and it is not oriented towards determining the correct actions for improvement or cure in the individual patient. Instead, the ill person's performance of suffering is translated into a standardized syndrome. For example, if a person buys cough syrup, the syndromic system interprets this as a case of influenza-like illness. An analysis of three nontraditional data sources exploited by NYCDH syndromic surveillance–911 emergency calls, ER chief complaints, and pharmaceutical sales–allows an examination of the displacement of the clinical diagnosis and the construction of alternative epidemiological registers.

Emergency Calls

New York is a city of emergencies. Over a million 911 calls are made each year requesting ambulance service (almost three thousand per day). Despite their

95 Stanley Joel Reiser, *Medicine and the Reign of Technology* (New York: Cambridge University Press, 1978).
96 Michel Foucault, *The Birth of the Clinic: An Archaeology of Medical Perception* (New York: Vintage Books, 1994): 196.

frequency, NYCDH syndromics workers believed that emergency ambulance dispatch calls were an untapped epidemic register. Of particular interest was the EMS call database. Each 911 caller's emergency complaint is fielded by an EMS dispatcher and routinely entered into a database. The database is categorized into fifty-two call types, ranging from ARREST to CARD (cardiac) to ABDPN (abdominal pain).97 In this computerized form, the caller's complaint is automatically dispatched to ambulances across the city.98 The syndromics workers exploited this differentiated collection of emergencies by identifying a limited number of call-types that correlated with specific health syndromes. They concluded that four call types (RESPIR-repiratory, DIFBR-difficulty breathing, SICK-sick adult, and SICPED-sick pediatric) most closely correlated with cases of the syndrome influenza-like illness. Flu-like illness is an important syndrome, of course, because many likely bioweapons appear similar to common flu in their prodromal stages.

Traditional public health surveillance monitored reports of clinical and laboratory expert judgment. Knowledge of disease was based on firsthand expert interpretations of *patients* or *cultures*.99 In this syndromic system on the contrary, the exclusive source of information is the callers vocal description of their suffering performed in the 911 call. Recovering and interpreting this performance is a multi-stepped process of translation. First, a caller tells the dispatcher that they have an emergency, such as difficulty breathing; then, the caller's vocal complaint is translated to an EMS call-type (DIFBR); finally, this call-type is translated into a syndrome such as influenza-like illness.

Through this process of translation, public health can track the numbers of specific syndromes in the restricted population of 911 callers. The characteristics of this population are important as well. Emergency requests for ambulance service are not typically made for routine illness but due to severe symptoms. Thus, this population is already bounded by the characteristic of severity, of emergency. This creates a surveillance bias that, depending on what one is looking for, either improves or worsens the sensitivity of the system. A follow-up analysis of emergency department clinical records demonstrated that nineteen per cent of ambulance arrivals were over the age of sixty-five. Ambulance arrivals were also more likely to suffer from extreme symptoms. According to the authors, this made the system better at detecting a bioweapon with severe prodromal stages, such as inhalational anthrax.

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97 Melanie Bescuildes, "Negotiating with Data Providers: Examples: Example 3," workshop on Data Transfer and Transformation, Second National Conference on Syndromic Surveillance (2003). Accessed from: <http://www.syndromic.org/work.html>

98 Jane Greenko, et al, "Clinical Evaluation of the Emergency Medical Services (EMS) Ambulance Dispatch-Based Syndromic Surveillance System, New York City," *Journal of Urban Health* vol. 80, no. 2, suppl. 1, (2003).

99 A medical culture is the practice of growing bacteria or viruses in the laboratory. I use the term simply to refer to laboratory diagnostics.

Chief Complaints

At almost every emergency department in the United States, health care is routinely administered through a triage system. French military surgeons developed the method of triage (from French *trier*-to sort) in order to prioritize care to those who needed it most in the difficult context of battlefield medicine. At emergency departments before the mid-20th century, patients were often cared for on a first-come, first-serve basis. Today, triage both prioritizes and differentiates care. Not only is the neediest cared for first, but patients that require specialist attention are sent to particular parts of the hospital (for example, pregnant women are sent to obstetrics). Determining triage is entirely subjective, however, and is most often performed by a nurse. The potential for costly mistakes is high. The Emergency Medical Treatment and Active Labor Act mandates that all triage interactions must be documented and form part of the patient's permanent medical record.100 Along with basic information about the patient such as age, gender, and home zip code, triage nurses record the patient's articulation of their symptoms–a so-called chief complaint–in a free-text field. According to Kristi Metzger, often the computerized record is the actual vocalization of the patient such as "I have a fever" or "coughing for two weeks."101

New York City public health officials identified these triage logs–databases of triage information–as potential epidemic registers. Today, the ED syndromic system electronically collects data from forty-eight hospitals encompassing eighty-six per cent of total annual emergency visits in New York City. While a number of data fields are collected (hospital name, date, mode of arrival, gender, age, etc.), the primary field under surveillance is the chief complaint. At the public health department, a computer algorithm analyzes the chief complaints for key text strings (such as "fever" or "cough") that can be coded into ICD-9 syndromes.102

The collection and analysis of chief complaint data reflects the increased trust in the ill person's expression of their suffering (dissolved in a population) rather than the clinical diagnosis of an expert. The patient's speech is taken at face value: NYCDH emphasizes to its ED partners that they should not truncate the chief complaint field which can be up to 200 characters long.103 However, this

100Robert Derlet, "Triage," *eMedicine*. Accessed from <http://www.emedicine.com/emerg/topic670.htm>

101Interview with Kristi Metzger. Statistician. Bureau of Epidemiology, New York City Department of Health and Mental Hygiene. (10 November, 2004).

102Heffernan, et. al., "Syndromic Surveillance in Public Health Practice, New York City," 859.

103Farzad Mostashari, "Syndromic ED Data Requirements", workshop on Data Transfer and Transformation, Second National Conference on Syndromic Surveillance (2003). Accessed at: http://www.syndromic.org/work

data provides no reciprocal knowledge about the individual patient. In fact, personal identifiers such as name, date of birth, and social security number are actively suppressed.104 The individual performance of suffering is taken out of the clinic and thrown into an epidemiological network. Medical intervention is not about a face-to-face encounter between carer and cared, expert and client; instead it turns individual behaviors into abstract factors within a fluctuating population flow.105

Drug Markets

For many years, pharmaceutical sales data has been believed to closely correlate with outbreaks of certain types of illness.106 . In 2002, NYCDH cemented a partnership with a New York-based pharmacy chain to monitor sales of over-the-counter drugs. Putting 248 stores in the city (thirty per cent of total over-the-counter sales in the city) under surveillance allowed a program with citywide scope to begin. At Duane Reade stores, sales information is automatically entered into a computerized database when UPC barcodes are scanned at the cash register. The database typically collects this information for marketing purposes; thus in a model agreement with an anonymous firm, the NYCDH agreed to deem all data "confidential and a trade secret."107 The database company hands over only raw data for the previous day: NABP (store number); store zip code; UPC number; date of sale; etc.108

Market trends, the "significant increase in sales of certain medications," are believed to indicate possible outbreaks.109 Through a mutation in the classical economic theory of rational market choice, consumer demand is assumed to directly reflect not only social wants or needs, but a population's epidemiological status.110 Each product is categorized by general class; in an example form distributed, these included cough suppressants, decongestants, antihistamines, and anti-diarrheals. Through a reverse translation from solution to problem, sales product categories are then grouped *by the syndromes they claim to solve*: thus cough suppressants and antihistamines are collated to determine the number of people suffering from influenza-like illness; anti-

104Ibid.
105cf. Robert Castel, "From dangerousness to risk" in Burchell, et. al, *Foucault Effect*.
106Julie. A Pavlin, et. al, "Innovative Surveillance Methods for Monitoring Dangerous Pathogens" in Stacey Knobler, Adel Mahmoud, and Leslie Pray, eds., *Biological Threats and Terrorism: Assessing the Science and Response Capabilities* (Washington, DC: National Academy Press, 2002): 186
107Bescuildes, "Example 4: Letter of agreement between the New York City Department of Health and Mental Hygiene and XXXXX [name redacted]. Accessed at: www.syndromic.org/work.
108Other data-fields: number of items sold; number of items left in stock; marker for promotion on each item; department code; sub-department code; promotion status of item on that day; and item description.
109Bescuildes, "Example 4."
110cf. Andrew Lakoff, "The Private Life of Numbers," in Stephen J. Collier and Aihwa Ong, eds., *Global Assemblages: Technology, Politics and Ethics and Anthropological Problems* (Malden, MA: Blackwell, 2005).

diarrheal sales reflect the number of people suffering from diarrhea. Rather than a clinical diagnosis of specific disease in an individual body, pharmaceutical based syndromic surveillance turns market trends into a picture of the flows of suffering across a population. This population is assumed to live in and through markets; the pharmacy outlet has encroached on the clinic as primary site of health care and cure.

Normed Pasts, Pathological Futures

The data collected and sorted by syndromes remains essentially meaningless. Another set of techniques is required to construct a population in which the emergence of an exceptional epidemic is visible. The way that raw information is organized and given meaning reflects the rationality guiding the system's construction. Analyzing this basically interpretive process reveals the political assumptions built into the technology: the *logos* that directs the techniques.

Kevin Konty points out that there are two philosophies on how to analyze a population of syndromes in order to detect a bioweapon initiated epidemic: signature and significance. Signature analytics compares observed data to an 'alternative hypothesis': a trend line plotted according to predictive assumptions about how an epidemic for a certain agent would look. Though good at restricting response to what can be determined to be a dangerous epidemic, signature analytics requires a foreknowledge of the characteristics of the biological agent in question.

The New York City system, on the contrary, is based explicitly on the assumption that this knowledge is lacking. NYCDH therefore looks instead for significance: identifying the truly aberrant health trend. The basic method, as Kevin put it, is to develop some idea of the status quo [a *norm*] and then watch to see if their is a break from it. The massive amounts of data collected by the syndromic network–literally thousands of pieces of information per day–is organized by a computer into a number of normed populations. Norm refers to a basic determination of value: in this case, the distinction between the normal state and the epidemic state. The problem is how to turn a quantified continuum (the absolute number of observed syndromes in a population) into a qualitative binary that distinguishes normal from epidemic.111 Syndromic surveillance systems must be able to determine the critical point (a certain number of observed syndromes) that signifies the presence of an epidemic. Most of the work done by the syndromic tech staff is adjusting this critical point in order to minimize both false-positives and false-negatives.

111cf. Georges Canguilhem, *The Normal and the Pathological* (New York: Zone Books, 2005).

NYCDH refers to this point as a *signal*: the "statistically significant aberration" from the norm. This norm is not a mere average. Rather, the norm is the statistical range (determined through a number of methods) in which syndromes fluctuate 'normally.' The signal point, on the other hand, is not a fixed numerical ceiling of syndrome cases. The signal is not just a fluctuation in the absolute number of cases, but a ranked aberration from the normal range. In other words, syndromic surveillance attempts to recognize and rank the improbable when it occurs. The more unlikely a certain spike in syndromes is, the more likely that it will trigger a signal.

The goal ultimately is to detect an unexpected, improbable epidemic in its emergent stages. This prospective surveillance restricts its analysis to "alive clusters" of syndrome cases in order to "detect ongoing epidemics" that are in danger of spreading further.112 Kevin Konty noted that in order to justify funding, syndromic surveillance must be able to detect the presence of an epidemic quicker than other surveillance systems. Due to this "desire to quickly detect outbreaks (especially those due to bioterrorism)" the ED chief complaint program has been tuned to detect increases in syndromes that occur within one to three days, rather than outbreaks that have been slowly growing for a longer time.113

Kevin compares the statistical method of aberration detection with techniques employed to detect credit card theft. By statistically analyzing a cardholder's buying patterns, this method is able to identify aberrant purchases and automatically cancel the card. Syndromic surveillance, on the other hand, analyzes the syndromal patterns of a population in order to detect an aberrant (and therefore perhaps epidemic) rate of syndrome cases.

The basic practice underlying the method of aberration detection is comparison: the comparison between statistically calculated norms and observed syndrome-totals. The norm is an alternative hypothetical value, similar to the control group utilized in standard experimental practice. However, whereas the control group (in cancer epidemiology, for example) is typically a second, placebo group under surveillance, in a syndromic system these control groups are cast into the historical past. Rather than comparing two contemporary groups, syndromics compares a historical control to a present, real-time observation. The historical control represents the number of syndrome cases that are expected to occur under normal conditions. Aberrations from this norm thus become recognizable as signals of a possible epidemic.

112"Statistical Methods for Emergency Department Chief Complaint Data." Accessed from: <http://www.syndromic.org/work.html>

113Heffernan, et al, "Syndromic Surveillance in Public Health Practice, New York City," 863.

Determining the normal syndromal patterns of a population requires a number of methods. It is important to emphasize here that the populations in question are not composed of every New York City resident. These are specifically delimited populations (populations of ER visitors, 911 callers, or pharmaceutical consumers) that are believed to best approximate the syndromal status of the citywide population during an epidemic. Determining the syndromal norm first requires a retrospective analysis of historical data from each of these sources. Normal fluctuations in historical data can be used to adjust the expected comparative norm For example, normal syndromal trends related to season, holidays, day-of-week and environmental temperature have been factored into the comparative norm. An increase in flu-like illness syndromes during the winter will be far less likely to produce a signal than a similar increase in summertime.114 Adjustments are made according to their predictive utility, that is, how consistently that shift (such as expecting more flu-like cases in winter) will reduce false-positives and false-negatives in historical data. Yet intervention is kept at a minimum. In our conversation, Kevin Konty cited the principal of parsimony, the principle that one should always choose the simplest explanation of a phenomenon.

In technical terms, the statistical determination of a normed population resembles the characteristic political rationality Foucault described as biopolitics. Focused on the population as object of knowledge and intervention, biopolitical techniques identify and adjust the regularities (norms) of mass biological existence: birth rates, mortality rates, life expectancies, or in this case, syndrome rates. As Foucault wrote, in biopolitical government "security mechanisms have to be installed around the random element inherent in a population of living beings so as to optimize a state of life."115 More specifically, the predictive normalization of the future employed by syndromic surveillance resembles certain biopolitical technologies of social insurance.116

Yet in fundamental ways syndromic surveillance adopts these technologies only to displace them. Where insurance technology argued that the accidents of fate in fact fell with calculable regularity, syndromic surveillance calculates the normal future *only to be able to recognize the unpredictably aberrant*. The same research is still being done: collecting historical rates of illness in a population, analyzing its fluctuations, and determining norms. Yet these carefully determined norms are not used to quantify or capitalize risk. Instead, the normed regularities of illness are only the background over which the significantly aberrant is expected to appear.

114Heffernan, et. al., "System Descriptions: New York City Syndromic Surveillance Systems," 24.
115Michel Foucault, *"Society Must Be Defended": Lectures at the Collège de France, 1975-76* (New York: Picador, 2003): 244.
116cf. Francois Ewald, "Insurance and Risk" in Burchell, et. al., *Foucault Effect*.

Francois Ewald writes of insurance technology that "to calculate a risk is to master time, to discipline the future."117 Syndromic surveillance assumes the inevitability of the unpredictable, unknown epidemic: the inevitability of a pathological future. Rather than disciplining the unpredictable, it only attempts to ensure its recognition. The future is defined by the expectation of exceptionality, an exceptionality that cannot be disciplined or capitalized but only monitored and controlled.

The (In) Security of Controlled Disorder

The enlistment of syndromic surveillance as a technology of vigilance against bioweapons dramatically refigures the structures of security. In the circuits of warfare, technologies of vigilance are sentinels, mechanisms that ensure the enemy is visible and can therefore be repelled. As such, the boundaries of their vision are also the boundaries of the defendable, of the secure. As Manuel Delanda argues, the boundaries of security produce the interiority that is the civil, political domain. When radar was first developed, for example, its vigilance was technologically limited to the territorial perimeter of the state. Later, however, the United States expanded the radar curtain to enclose the entire continent and ultimately, through the development of the nuclear umbrella, "enlarged its 'walls' to global proportions.118 The enemy (and in particular nuclear armaments) had nowhere to hide.

The assumptions and vigilance capacity of syndromic surveillance are far different than the integrated radar system, characterized by uncertainty rather than global vision. Even vigilance over the territory is considered impossible:

> Because of the incubation delays, no nation can protect itself (from biological attack) simply by screening travelers at its borders. Nor can a country such as the United States hope to inspect more than a fraction of the food it imports daily. As agricultural markets become increasingly global, the potential vulnerability of nations to food-borne natural or intentional disease will continue to increase.119

Rather than the territory of the state, the boundaries of syndromic vigilance run through the living bodies of the population. Only days after a bioweapon has been released, when the sick begin to appear at emergency rooms and hospitals, will any sign of the enemy's presence emerge. Rather than looking

117Ibid., 207.
118Manuel Delanda, *War in the Age of Intelligent Machines* (New York: Zone Books, 1991): 51-55.
119Chyba, 15.

for invasions across protected space (as radar does, for example), syndromic surveillance monitors fluctuations in syndrome levels over time.

At stake is an assumed inability to prevent or defend against bioweapons attacks. As Dr. William Roper narrated, while "the public's expectations, not surprisingly, called for 100% protection with no risks," the "goal of public health is to minimize risks." In this context, the task of syndromic surveillance is to "shorten the time from absolute chaos to controlled disorder."120 Giorgio Agamben glosses Foucault's concept of security in order to articulate the shifts in contemporary geopolitical rationality. He writes:

> While disciplinary power isolates and closes off territories, measures of security lead to an opening and globalisation; while the law wants to prevent and prescribe, security wants to intervene in ongoing processes to direct them. In a word, discipline wants to produce order, while security wants to guide disorder.121

Biodefense disease surveillance guides and manages the "controlled disorder" of the microbe-human ecology in an increasingly contagious world. One can perhaps imagine then a *secured* population spreading beyond the confines of the national territory. The future of war in an 'asymmetric' age certainly does not appear to be one that emphasizes the defense of borders. Rather, specific populations are watched and managed to ensure that the "controlled disorder" of global flows of goods, people, microbes do not develop into the chaos of epidemic.

Thoughts on Uncertain Times

To conclude, I want to meditate on the temporality of syndromic observation and, subsequently, my own ethnographic observation. The objects and problems posed by these two modes of inquiry (technological and anthropological) are quite distinct. Yet both share the temporal space of the contemporary and the aspiration of understanding our time.[122] In important ways, the semantics of temporality are in crisis. The history of progress that defined the modern imagination has begun to fade. The destructive consequences of so-called progress are ever more visible, particularly in ecological damage but also in global poverty and violence. At the same time, dreams of a perfectible future are ever more difficult to hold. From assymetric

120Strongin and Redhead, "Bioterrorism" in Rogers, ed. *Bioterrorism Reader* 84-85.
121Giorgio Agamben, "Security and Terror," *Theory and Event* 5:4.
[122] Cf. Paul Rabinow's discussion of the anthropology of the contemporary in: Rabinow, *French DNA: Trouble in Purgatory* (Chicago: University of Chicago Press, 1999) and *Anthropos Today: Reflections on Modern Equipment* (Princeton: Princeton University Press, 2003).

warfare to emerging infectious diseases, the future is increasingly presented as uncertain but potentially catastrophic.

The rise of apocalyptic eschatologies is one social response to present uncertainty. The logic is not foreign to the bioterrorism discourse. Monica Schoch-Spana, for one, has demonstrated that bioterrorism scenarios used to imagine possible futures have an apocalyptic character.123 In these texts, computer games, and role-playing drills the threat of bioterrorism is assumed at the outset to be inevitable: in Schoch-Spana's words, not a matter of if, but when. In turn, the inevitable threat is narrated in catastrophic terms. In the response-game *Dark Winter*, for example, smallpox quickly spread beyond the control of the role-playing government, infecting tens of thousands and quickly reaching pandemic scale. Or as Admiral Stansfield Turner sums up, biological weapons (like none other than nuclear) have the capacity to bring the US past the "point of non-recovery."124

An alternative ethical approach to the late modern condition is characterized by the calculus of risk. Understanding the contemporary in terms of risk means acknowledging that decisions in the present shape an uncertain future with possible costs, though in uncertain ways. Yet this uncertain future is not wholly unknowable in the sense of an imminent danger. Risk "we construct between ourselves [while] danger is 'out there,'" the way a map transforms land into a cultural and political medium.125 As Francois Ewald writes of insurance technologies, "for an event to be a risk, it must be possible to evaluate its probability."126 Essential to the concept of risk is the moral imperative to act in the present to reduce risks. The future is not understood as an inevitable disaster that comes from somewhere 'out there'. Rather, it is understood as uncertain and dangerous but ultimately our responsibility.

I have argued that syndromic surveillance utilizes a statistics of risk, but unlike insurance technologies does not do so in order to discipline the future. In essence, it assumes the incomprehensibility of the future: the appearance of the epidemic from somewhere 'out there.' Rather than attempting to calculate the probability of a biological weapons attack, syndromic surveillance claims only to be able to identify (but not define) the improbable when it occurs. Syndromic surveillance refuses to understand the present in terms of risk-based decision making. All action is displaced into the future where it is formulated in terms of *response* rather than risk.

123Monica Schoch-Spana, "Bioterrorism: US Public Health and a Secular Apocalypse" *Anthropology Today* vol. 20, no. 5 (October 2004).
124Tara O'Toole, "Emerging Illness and Bioterrorism: Implications for Public Health," *Journal of Urban Health* vol. 78, no. 2 (June 2001): 396.
125Robert Paine, "Danger and the no-risk thesis," in Susanna M. Hoffman and Anthony Oliver-Smith, eds., *Catastrophe and Culture* (Santa Fe: School of American Research Press, 2002).
126Ewald, "Insurance and Risk."

If risks are eminently political, than syndromic surveillance is a sort of anti-politics machine. By displacing decisions into the future, the space of politics in which decisions are debated is also displaced. The system is designed to ensure that disasters are visible when they occur so that they can be ameliorated: so that "absolute chaos" can be turned to "controlled disorder". In other words, syndromic technology ensures what Robert Paine calls the "no-risk thesis": the refusal to turn a danger into a calculable risk. By defining the future as incalculable but controllable, syndromic observation avoids confronting the influence present actions may have on the future. By focusing on surveillance and response as the primary method of dealing with the bioterrorism threat, the United States displaces an understanding of how history has shaped the contemporary threat. At stake for the United States is a denial of *responsibility* in the production of global insecurity and therefore the likelihood that present actions will continue to exacerbate risky circumstances. Giorgio Agamben presents the political dilemma:

> Maybe the time has come to work towards the prevention of disorder and catastrophe, and not merely towards their control. Today, there are plans for all kinds of emergencies (ecological, medical, military), but there is no politics to prevent them…It is the task of democratic politics to prevent the development of conditions which lead to hatred, terror, and destruction–and not to reduce itself to attempts to control them once they occur.127

The approach to emerging infectious diseases is revealing. The comparison is not random. Like the bioweapon, the future emergence and character of novel infectious diseases has been defined as highly uncertain. Proponents of syndromic surveillance argue that the system is technologically capable of detecting unexpected natural epidemics as well as deliberate ones. In short, if syndromic surveillance works, then an unexpected natural epidemic (like a bioweapons attack) becomes a controllable danger. Displaced by this logic, however, is the way present actions are responsible for producing infectious disease risks. The emergence of nearly every one of these new diseases has been ascribed to human actions:

> Responsible factors include ecological changes, such as those due to agricultural or economic development or to anomalies in the climate; human demographic changes and behavior; travel and commerce; technology and industry; microbial adaptation and change; and breakdown of public health measures.128

127Agamben, 2.
128Morse, "Factors in the Emergence," 7.

Even microbial adaptation (increased pathogenicity or drug resistance) has been largely fueled by human interventions such as the over-prescription of pharmaceuticals. And as Paul Farmer suggests, much of the contours and destructiveness of epidemics generally can be attributed to social inequality.129 Pouring funding into improved surveillance measures may be able to control or ameliorate an epidemic through early detection (although this, too, is highly speculative). However, the fundamental causes are displaced and the unequally distributed costs are ignored. Controlled disorder may be secure for those within the wealthy bastions of the world, where medical response and intervention is readily available. Yet as Farmer points out, while disease easily crosses borders, biomedical technologies and expertise are typically held up at customs.130

The circuits of war and politics enmesh the bioweapon even more tightly than the emerging infection. Bioweapons would often be artificially manufactured, altered through gene-splicing, or dispersed through aerosols; they would always be deliberately released. This problematic hybrid of human intentions and natural properties cannot be dealt with in either exclusively scientific or political terms. Syndromic surveillance is built in response to the failure of both science and diplomacy to solve the bioterrorism problem. Yet instead of addressing the failing modern division of science from politics, syndromic surveillance displaces the problem altogether. The controlled disorder of syndromic observation makes no claim to a scientific cure for the bioweapon (such as rapid vaccine development); nor does it claim to a political cure (such as nonproliferation). It offers no cure at all, displacing all action to a future response and (all hopes to a controlled disorder.)

The anthrax mailings of October 2001 offer a prime example of how response displaces responsibility. Leaving aside the fact that syndromic surveillance could not have detected such a small attack, the point is that a focus on emergency response displaced the historical origins of the event. Rather than an unknowable danger coming from ‘out there’, the roots of the anthrax attacks were fully internal to the United States. The attacker has yet to be identified. However, genetic investigations have determined that the bioweapon was the rare and particularly virulent Ames strain of anthrax. Military labs in the U.S. developed the Ames strains, either as an offensive weapon during the 1960s or for ostensibly defensive research after the global ban in 1972. The main custodian for the material is the U.S. Army lab at Fort Detrick, who had loaned

129Ibid.
130Paul Farmer, *Infections and Inequalities: The Modern Plagues* (Berkeley: University of California Press, 2001).

the material to other labs for research purposes.131 By understanding attacks like these exclusively in terms of disaster response, the responsibility of the U.S. military (and in particular its biological weapons programs) is displaced and forgotten. The costs are clear. Secret research on bioweapons within military institutions for allegedly defensive purposes continues and the probability of a pathological future, a future in which epidemic disorder becomes uncontrollable, increases.

My observation of the contemporary is an attempt to situate syndromic surveillance within the multiple histories of health and security. In investigating the emergence of a technology, I too was faced with uncertainty, though of a slightly different mode. The object of my analysis was not at all clear. As two of the developers of the NYC syndromic system acknowledge, "Despite a flood of interest and funding, many questions remain: Just what is syndromic surveillance?"132

My paper doesn't necessarily answer that question, or at least, it doesn't utilize such ontological terms. On the contrary, I hope to intervene in the impending solidification of the syndromic security apparatus by temporally jarring it with the genealogies of the past, intertwined and complex, that surface in the present. The ostensible novelty of emergent technologies is always deeply conditioned by the past, more an assemblage of extant tools than a *sui generis* creation. I conclude with the words of French philosopher Michel Serres. He writes:

> What things are contemporary? Consider a late-model car. It is a disparate aggregate of scientific and technical solutions dating from different periods. One can date it component by component: this part was invented at the turn of the century, another ten years ago, and Carnot's cycle is almost two hundred years old. Not to mention that the wheel dates back to neolithic times. The ensemble is only contemporary by assemblage, by its design, its finish, sometimes only by the slickness of the advertising that surrounds it.133

Anyone who claims to know the future is deluded. Yet it is our obligation to engage the present, as a brief moment chained to both past and future, and thereby take responsibility for reducing the pathologies of the future.

131Steve Fainaru and Joby Warrick, "Ames Strain of Anthrax Limited to Few Labs," [online] *Washington Post* 30 November, 2001: AO1. Accessed from: <http://www.washingtonpost.com/ac2/wp-dyn/A36408-2001Nov29>

132Mostashari and Hartman, "Syndromic Surveillance: A Local Perspective," i1.

133Michel Serres with Bruno Latour, *Conversations on Science, Culture, and Time* (Ann Arbor: University of Michigan Press, 1995). Quoted in Rabinow, *French DNA*.