

IMMUNIZING COMMUNITIES:

THE BIOPOLITICS OF VACCINATION AND ITS HISTORICAL ALTERNATIVE

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Thesis submitted to the School of Graduate Studies
in partial fulfillment of the requirements of the degree of

Interdisciplinary PhD

Memorial University of Newfoundland

September 2017

St. John's Newfoundland and Labrador

Abstract

In *Immunizing Communities: The Biopolitics of Vaccination and its Historical Alternative*, Carol-Ann Galego turns to the history of medicine in response to one of the most pertinent questions in the contemporary study of biopolitics: is it possible to promote life without inadvertently undermining it? She traces the development of two alternative methods of preventing epidemics: vaccination and the prophylactic use of homeopathy. Although both methods were developed in the same year and advanced with the common goal of mitigating the effects of infectious disease, vaccination and homeoprophylaxis are nevertheless worlds apart. While vaccination was ushered into mainstream practice through risk analysis and retroactively validated by later developments in modern immunology, homeopathy was motivated by the medical maxim to “first do no harm” and rendered meaningful by a romantic conception of disease as a dynamic interaction between an organism and its environment. Galego argues that the differences between these two preventative strategies signal nothing less than a fundamental difference in our understanding of how we, as living organisms, live in and interact with the world and, no less radically, of how we should best navigate our limited capacity to understand these complex interactions. She finds in the history of homeopathy and its roots in German romantic medicine an alternative trajectory to modern developments in immunology and risk analysis, which have come to define our relations with others—indeed our very existence—as an inevitable negotiation of risk. Uniquely positioned to expose the limitations of the modern effort to immunize ourselves against the world, this untold chapter in the history of medicine considers alternative ways of living in and fostering healthy community.

KEYWORDS: Biopolitics; Michel Foucault; Roberto Esposito; History of Medicine; Immunity; Vaccination; Edward Jenner; Risk Analysis; Ulrich Beck; Anthony Giddens; Homeopathy; Samuel Hahnemann; German Romanticism; Romantic Medicine *Naturphilosophie*; Friedrich Schelling; Johann Wolfgang von Goethe.

Acknowledgments

First and foremost, I would like to thank my sister, Christina, whose eager engagement, critical thinking, and attention to detail helped me convert a string of interesting ideas into a comprehensive thesis. From the early stages of grant writing to the final sea change, her input throughout the years has greatly contributed to the integrity of this project. I would also like to thank my parents, extended family, practitioners, and friends, most notably my long-standing interlocutor, Toby, for reminding me to keep my thesis *schmesis* in perspective and not to forget the world that exists beyond the completion of a dissertation: *This too shall pass*. For my partner Carl; for his sustained nurturance and unwavering faith in me throughout this arduous process; for his respect for my work and uniquely delicate way of handling my stress; and for his ready assistance translating old German texts into English, I am forever grateful.

Many thanks are due to my co-supervisors, Drs. Steve Crocker, Sean McGrath, and Jim Connor, whose confidence in my project, constructive feedback, and trust in my capacity for self-direction afforded me with a uniquely exploratory and deeply fulfilling learning experience; to Dr. Jennifer Dyer, director of the Interdisciplinary Program at MUN, whose prompt responses, assistance with logistical matters, and sustained encouragement greatly facilitated the entire process of my doctoral studies; to Markus Enders from the University of Freiburg, whose involvement on my committee helped grant me access to important library resources; to my first German instructors, Anna Stahlhofen and Dr. Maria Mayr, and the wonderful team of instructors at the *Sprachenkolleg für Ausländische Studierende*, whose enthusiasm and rigor greatly facilitated my intensive study of the German language; to immunologist Dr. Tetyana Obukhanych, whose detailed and comprehensive introduction to the fundamentals of immunity helped me engage more confidently and critically with contemporary scientific contributions and provided me with a compelling new perspective; and to the helpful respondents at the academic conferences I attended – especially my fellow Canadian, Dr. Alexander Wilson – whose feedback to my preliminary ideas prompted me to reconsider and reconfigure my argument in critical ways.

This project was greatly enhanced by my time spent at the *Institut für Geschichte der Medizin der Robert Bosch Stiftung* in Stuttgart, which was funded by a Hans Walz research grant. I am most grateful for the warm welcome and generous support provided by the entire staff, especially Prof. Dr. Robert Jütte, Prof. Dr. Martin Dinges, and Frau Dorothea Schmucker. The abundant resources that I could avail at the library; the respectfully distant, though incredibly helpful, input that I was offered; and the idyllic location, amounted to one of the most memorable and valued experiences in my academic career. Special thanks goes out to Marion Baschin for her help deciphering a particularly difficult piece of old German handwriting and to Abigayle and Steven, whose serendipitous input from abroad helped redirect my thesis and remind me of its contemporary relevance.

The depth of my engagement in this project would not have been possible without funding provided by the Social Sciences and Humanities Research Council (SSHRC). I am deeply indebted to the assistance of the then Dean of Graduate Studies, Dr. Noreen Golfman, and the brilliant Grantscrafter, Dr. Rosemary Osbourne, in helping me secure a CGS Doctoral Award.

Freiburg, Germany.

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Preface: Edward Jenner and the Case for Cowpox

Despite persistent contemporary debates surrounding the question of vaccination and the ongoing assumption of risks that it requires, Edward Jenner's (1749-1823) method of inoculation with cowpox is widely celebrated for beginning a process that would eventually result in the successful eradication of the smallpox virus in 1980. The English country doctor first started to entertain the idea that inoculation with cowpox could forever shield a person from the scourges of smallpox in the early 1770s, when he began to take note of a striking coincidence: sufferers of cowpox did not contract smallpox, in some cases not even many years after the initial infection. While Jenner's early observations were made a century before the rise of modern immunology – which would retroactively provide a physiological explanation for this pattern – the observation that survivors of smallpox were resistant to subsequent encounters with the disease is ancient¹ and it was with this understanding of “immunity” that Jenner considered the protective properties of cowpox. In this context, when “immunity” was used in a medical sense it did not yet invoke defensive images of antibodies or macrophages; it simply referred to the empirical observation that some people, places, and groups appear to manifest disease less frequently and less severely than others (Cohen 175).

Jenner started compiling information related to this phenomenon and,

¹ As early as 430 B.C, survivors of smallpox were summoned to care for the afflicted (Gross and Sepkowitz 55).

over time, accumulated several case studies of individuals known to have suffered from cowpox who later resisted contracting smallpox (Hays 126).² He was inspired by his findings to investigate this phenomenon, which was also well-established folk knowledge at the time: cowpox preserved milk maidens' unblemished skin by saving them from the ravages of “the speckled monster.” Jenner hoped that further insight into the phenomenon could help protect others—others who were not dairy maids—from the virulent disease.

And so, when he learned that the dairy farmer, Sarah Nelmes, had contracted cowpox, Jenner seized the opportunity to test his hypothesis that this minor affliction could have protective properties against smallpox. In a famous experiment that would later be recorded as the first vaccination, on 14 May 1796, Jenner inserted matter taken from a sore on Nelmes' hand into two superficial incisions he had made on the arm of James Phipps, “a healthy boy, about eight years old” (*Inquiry* 51). From the seventh to the ninth day following vaccination, Jenner observed the course of a mild illness in his young patient—including a loss of appetite, slight headache, and restlessness—and was confident that the inoculation had effectively transmitted the cowpox disease from Nelmes to Phipps. The more pertinent question for Jenner, however, was whether the boy, after exhibiting the systemic effects of cowpox ever so

² The first case Jenner outlines in his *Inquiry*, for example, details the experiences of John Merret, a farmer who had contracted cowpox in 1770 and failed to respond to variolation in 1797, when the entire population of Berkeley was inoculated with smallpox in anticipation of an approaching epidemic. Jenner himself tried to variolate Merret, but the procedure failed to elicit the symptoms characteristic of smallpox. During the whole time that his family members had smallpox, one of whom had it severely, the man received no injury from exposure to the contagious disease (9-10).

slightly, would consequently be rendered insusceptible thereafter to smallpox. In order to test the protective properties of inoculated cowpox, six weeks later Jenner inoculated Phipps with variolous matter that he had immediately extracted from a smallpox pustule:

Several slight punctures and incisions were made on both his arms, and the matter was carefully inserted, but no disease followed. The same appearances were observable on the arms as we commonly see when a patient has variolous matter applied, after having either the Cow Pox or Small Pox. Several months afterwards he was again inoculated with variolous matter, but no sensible effect was produced on the constitution (*Inquiry* 53).

Observing in Phipps the same immune response as those with recorded histories of either cowpox or smallpox, Jenner believed it was safe to assume that the young patient's medically acquired immunity offered the same protection observed in those who had encountered the disease the “traditional” way, that is, by milking cows. More specifically, he concluded that “the disease produced in James Phipps by vaccination with the cowpox matter taken from Sarah Nelmes had the same properties as the disease produced by direct contact with the infected cow” (Hays 30). Apparently unmindful of the fact that, as a milk maid, Nelmes was regularly exposed to cowpox, Jenner

expressed confidence that extracting disease material from its immediate context and inserting it into the arm of someone remote from that context was sufficient to convey a *bona fide* state of immunity. He was implicitly operating under an assumption that would later become emblematic of modernity's enclosure of the body from the outside world: he understood protection against disease as a state of being that could be achieved within an individual body, rather than as an ongoing, dynamic interplay among living organisms.

This was arguably the aspect of Jenner's thesis that allowed the practice of vaccination to spread as rapidly as it did: the possibility of person-to-person transmission of cowpox significantly reduced dependence on animals as a source of vaccines and provided a means of transporting inoculation material to countries in which vaccination would have been otherwise impossible.³ Although others before him had observed the protective properties of cowpox, it was Jenner's contention that direct cow-to-person transmission was not necessary to acquire cowpox—and by extension its lifelong protective properties—that made it possible to envision vaccination as a universal solution to the smallpox problem (Jannetta 30).⁴

³ Vaccines could be transported over short distances or in cool climates by preserving the disease matter, for example, between sheets of glass. For longer distances, particularly in warmer climates, the vaccine was maintained by weekly arm-to-arm transmission through volunteers or children. This method was used to spread cowpox through the British forces in India and to distribute vaccine from the Spanish Empire to Central and South America (Baxby, "Jenner Bicentenary," 8). For a detailed study on the early transmission of vaccine material, see Rusnock's "Catching Cowpox."

⁴ Though he continues to be celebrated for this contribution, some claim that Jenner's fame is the result of political opportunism rather than genuine discovery. See, for example, Horton's "Myths in Medicine; Jenner Did Not Discover Vaccination." While the relevance and impact of Jenner's contributions to the history of vaccination is a contentious subject, he is generally acknowledged (for better or for worse) for introducing scientific testing to this commonly held belief, disseminating his results widely, and introducing the arm-to-arm method of transmission. For

After waiting nearly two years to reproduce the results observed in the Nelmes-Phipps transmission (that there were no cases of cowpox to be found in Gloucestershire in 1797 attests to the disease's rarity), Jenner inoculated a series of children, transmitting the mild cowpox disease from child to child. Impressed that the children also exhibited the characteristic signs of resistance to subsequent attempts at exposing them to smallpox, in September 1798, he published his results in *An Inquiry into the Causes and Effects of the Variolae Vaccinae*, declaring that "What renders the Cow-pox virus so extremely singular, is that the person who has been thus affected is for ever after secure from the infection of the Small Pox; neither exposure to the variolous effluvia, nor the insertion of the matter into the skin, producing this distemper [smallpox]" (16). He encouraged his colleagues to test and verify the experiments that supported this bold claim and promised to continue his own research, hopeful that pursuing this line of inquiry would prove to be essentially beneficial to humankind (96).

By substituting smallpox material with cowpox, Jenner promised to provide a better alternative to the prominent method of inoculation at the time, which involved using a non-virulent strain of smallpox material, a technique referred to as *variolation*, in the hope of preventing a severe case. In using material that caused only a mild reaction in humans and was not easily contagious from person to person, Jenner addressed two of the main

balanced accounts on this issue, see Baxby's "Edward Jenner's Role" and Ridel's "Edward Jenner and the History of Smallpox Vaccination."

objections to variolation: despite efforts to select disease material from a relatively safe manifestation of the disease, variolation proved, first of all, to be sometimes fatal to individuals, and secondly, occasionally responsible for triggering full-blown epidemics (Durbach Ch. 1, location 435, par. 15; Razzell ix). In either case, variolation kept the smallpox disease in circulation. As such, although variolation had reduced the lethal impact of smallpox in many countries during the late eighteenth century, it was intrinsically incompatible with the goal of disease eradication. By using a related virus that protected inoculated persons against smallpox but was not transmissible to contacts, Jenner's innovation made the goal to forever free the world of smallpox seem like an attainable one (Fenner vii).

Though Jenner claimed to have achieved the same prophylactic ends as variolation, that is, lifelong immunity against smallpox, the widespread acceptance of his innovation inhered in his method's promise of entailing little or no apparent risk of harm to both the patient and the population. Indeed, he continues to be celebrated by many for his insight that "it was possible to use a related, mild infection to immunize against a different severe one" (Wilkinson 93), but his early claim that vaccination provided lifelong protection has long since been challenged, even by his most loyal supporters. Today the general consensus seems to be that "Jenner rashly argued that one vaccination conferred life-long immunity to smallpox, and only gradually did his supporters realize that that was not so" (Hays 127). No longer convinced that a single

encounter with disease can generate lasting protection, contemporary scientists are more inclined to recognize the importance of continual re-exposure to disease in the achievement of long-term immunity.⁵

Over time, the gradual acceptance that immunity eventually wanes was addressed by the implementation of revaccination. Abandoning the early promise that vaccination could immediately convey lifelong immunity, health authorities remained hopeful that a universal program of vaccination and revaccination could effectively rid the world of smallpox. They recognized that if, at any given time, a sufficient portion of the population was immune to it, the disease's circulation would be interrupted. No longer invested in granting lasting immunity, health authorities refocused their efforts on eradicating the disease worldwide. They interpreted the problem of waning immunity not as a prompt to find other, non-defensive, strategies for co-existence with pathogens, but as confirmation that the only way to assure lasting protection is by annihilating the enemy. But as we will learn, the promise of eradication proved just as difficult to keep as the promise of life-long immunity it was designed to replace. Both failed to recognize that efforts to prevent infection often have the perverse effect of making us even more susceptible to the diseases from which we seek protection.

⁵ From this perspective, some suggest that the discrepancy between Jenner's observations of vaccines' lasting efficacy and the many documented cases of waning immunity can best be understood in light of the fact that Jenner regularly "challenged" (i.e. re-exposed) his subjects with smallpox inoculation in order to test his vaccines. While such testing was for the expressed purpose of verifying patients' susceptibility to smallpox, it was also a form of boosting patients' level of protection as compared to the eventual majority of those who received vaccines without being challenged.

Though Jenner himself was not prepared to publicly accept the possibility that the efficacy of vaccines might be temporary,⁶ he maintained that even if the immunity they conferred was not as long-lasting as he had foreseen, vaccination remained an advantageous alternative to variolation insofar as the latter method risked considerably more harm to those seeking protection. He was assured by the fact that he had never heard of a dangerous or fatal case of cowpox and accordingly “left no doubt about his conviction that, in time, inoculation with cowpox virus would prove far superior to even the most cautiously administered variolation” (Jannetta 32). Jenner was not alone in making this assessment, and after vaccination became well established, acceptance of variolation declined and, in some cases, the practice was completely outlawed. The British Parliament, for example, criminalized variolation in 1841 out of fear that the practice contributed to, rather than arrested, the spread of smallpox (Durbach Ch.1, location 451, par. 17). Although the use of variolation had been previously defended as a rationally safer gamble than succumbing to natural smallpox, when vaccination was introduced as an even safer alternative, the risks of variolation could no longer be justified.

While Jenner's innovation was widely accepted in his time as an improvement upon the old method of inoculating with smallpox material, his

⁶ According to Baxby, the closest that Jenner came to admitting that vaccines might not provide lifelong protection was in a letter written by Jenner in 1805: “The security given to the constitution by the vaccine inoculation is exactly equal to that given by the variolous. To expect more from it would be wrong. As failures in the latter are constantly presenting themselves . . . we must expect to find them in the former also” (qtd. in *Jenner's Smallpox Vaccine* 145).

hope of entirely mitigating the risks of prophylaxis were never fully realized. His method of arm-to-arm transmission allowed vaccination to reach geographic areas that would otherwise have been impossible to reach, but cowpox was not the only disease being conveyed in the process. Cowpox itself was not a fatal illness, but the practice of lancing lesions to collect diseased lymph would expose patients to other potentially very dangerous infections. By the mid-nineteenth century, some physicians began to argue that diseases such as erysipelas, tuberculosis, syphilis, and leprosy could be transmitted this way (Biddiss and Cartwright 78; Rusnock, "Catching Cowpox," 29). Even after vaccination no longer involved the exchange of bodily fluids, bacterial contamination remained a problem (Biss 17). In short, while the transition to vaccination alleviated some of the concerns associated with variolation, it also generated new suspicions about other unforeseen albeit harrowing side effects. Although it represented a significant technological development in the history of immunization, vaccination could not entirely break away from the rhetoric of risk that had surrounded variolation.

More than two hundred years later, the same controversial question that attended the early practice of immunization continues to press upon us: is it a risk worth taking? The specific risks of the medical procedure have, no doubt, changed over the years. Eula Biss observes that "[n]ow our vaccines are, if all is well, sterile." (17). So now it is the additives and adjuvants, she argues, that people worry about in vaccines: "Our witches brew is chemical"

(17). But what remains for the most part remarkably unchanged is the fact that we continue to approach the decision for or against immunization in terms of risk analysis (Blower 286).⁷ Despite years of technological advances, contemporary medicine has still not succeeded in manufacturing vaccines deemed to be completely safe. As Paul Fine and Jacqueline Clarkson write: “Though contemporary vaccine preparations must pass rigorous criteria for safety, it is unlikely that any vaccination procedure will be absolutely safe, in particular when administered routinely to large populations” (1012). We have learned simply to accept that no preventative medical intervention is completely risk-free.

What is more, we have come to accept the political conflicts implied in using a prophylactic strategy that imposes a burden of risk on the very lives it intends to protect. When the risks of vaccination are distributed throughout the population—for example, when they are assigned to designated demographics or individual bodies of a certain kind—problematic tensions between the multiplicity of singular individuals and the community at large become apparent. In this way, the persistent presence of risk in our efforts to eradicate disease has been formative not only within the domain of public health. At a very deep, one might say cellular, level, the injection of risk into the project of immunizing communities has infected our very understanding of

⁷ In her commentary on Daniel Bernoulli's calculations, for example, Sally Blower argues that Bernoulli's emphasis on the population-level benefits of public health intervention—for example, the addition of 25 000 useful “Civil Lives” (as opposed to the risks faced by babies who do not actively contribute to the State's welfare)—continues to be the primary focus in contemporary public health initiatives (287).

what it means to live in relation with others. Providing a vivid portrayal of the competing interests that can emerge in a public health enterprise, vaccination is often, as we shall see, referenced as a paradigmatic expression of the conflicts at the heart of the social contract. As such, the question of vaccination is never simply a medical question but always also a political one. And, as I hope to convey with the following work, when we consider the historical conditions that gave rise to the modern formulation of vaccination in view of a historically-situated medical alternative, we are well poised to displace what has become one of the most powerful modern metaphors for understanding the politics of life.

Introduction: *Same Old Story, in a Different Way*

The beginning of this story is well known. It borrows from one of the most frequently cited chapters in the history of medicine: the development of the first vaccine. In the pages that follow, I detail the ways in which the early medical effort to prevent smallpox was completely transformed by the mathematical analyses undertaken to legitimize the risks of prophylactic intervention. I then consider how the public controversy that followed this development – whether to privilege the health of the individual or the safety of the community – persists to the present day. As such, this is a story as much about the present as it is about the past, providing insight into the political challenges that we continue to face, not only in our efforts to mitigate the effects of contagious disease, but also, more generally, in our attempts to safeguard life without inadvertently endangering it.

The continuation of this story is lesser known, and it is less a continuation than an alternative perspective from which to consider the political implications of immunizing communities. I supplement my reading of vaccination and its political implications by returning to Jenner's experiments with cowpox inoculation, in order to trace another trajectory in the history of medicine. Although Louis Pasteur (1822-1895), Robert Koch (1843-1910), and the founders of modern immunology retrospectively claimed Jenner as their predecessor, and medical mathematicians of the time were eager to demonstrate the numerical advantages of implementing his procedure on a

social scale, Jenner's contributions were largely empirical and do not betray any overt philosophical or political motivations (Cohen 85). Indicative of its underdetermination,⁸ the observed efficacy of vaccination was not only appropriated by later developments in immunology; it was also rendered meaningful by another, radically different, medical tradition.

German physician, Samuel Hahnemann (1755-1843), the founder of homeopathy, celebrated Jenner's method of inoculating with cowpox—a disease similar to, though much less virulent than, the smallpox it was intended to prevent. He recognized it as confirmation of his own observation that an organism can never have two similar diseases at the same time, and endeavored to develop this prophylactic principle further in his use of specific remedies to prevent other contagious diseases.⁹ Motivated by the medical maxim to “first do no harm” and by the recognition that inoculated disease material does not always elicit a response in patients, Hahnemann thought that it would be both safer and more effective to extend the principle of Jenner's method to include the use of specially prepared remedies, which he believed capable of inducing artificial states of disease. In this way, he endeavored to provide the protection associated with vaccination without the

⁸ 'Underdetermination' refers to the insufficiency of evidence to determine theoretical explanation. The same evidence can, for example, be used to confirm two competing theories.

⁹ Hahnemann's method of preventing contagious diseases by prophylactically administering diluted remedies that induce symptoms similar to those associated with the disease to be prevented, *homeoprophylaxis*, is often thought to have influenced the development of *homoprophylaxis*, the use of diluted disease material, 'nosodes,' to prevent communicable diseases. Today, this distinction is often overlooked and most instances of 'homeoprophylaxis' cited in the scientific literature and offered in practice are in fact homoprophylaxis. See Decker and Verspoor, “Nosodes,” 70; Papsch, “Nosoden,” 74-77 and Vieracker, “Jenners Vakzination,” 38-40.

risks.

Hahnemann's response to infectious disease was informed by his understanding of disease as a dynamic interaction between an organism and its environment that could not be reduced to material causes. He accordingly tended to both the disease agent as well as the unique susceptibility of the exposed individual. As such, his approach was inherently at odds with the numerical analyses that helped legitimize inoculation by generalizing the risks of disease – whether naturally or artificially induced – across the population. Furthermore, by developing a prophylactic method that did not involve the transfer of disease material or otherwise impose risk on individual bodies, Hahnemann's approach preserved the possibility of preventing communicable diseases without bringing the well-being of the individual in tension with the protection of the community, a possibility that is often precluded in the controversy surrounding the decision to vaccinate.

His work in the area of prophylaxis garnered considerable attention and, at the prompting of the prominent physician Christoph Wilhelm Hufeland (1762-1836), the efficacy of his method of preventing scarlet fever homeopathically was verified by numerous physicians throughout the German territories.¹⁰ Though wary of Hahnemann's efforts to undermine existing

¹⁰ As historian Wilhelm Ameke points out, the “judgment of the impartial Hufeland is in sharp contrast with the utterances of the majority of allopathic authors, who, on innumerable occasions, did not hesitate to speak of homeopathy as a 'delusion' and 'a system of deception'” (x). It also distinguishes itself from the hagiographical accounts of Hahnemann and the uncritical reviews of homeopathy produced by his devoted followers. According to Kuzniar, “the fact that [Hahnemann] forged his own persona as a scientific genius and medical prophet encouraged hagiographic deference, as can be seen even to this day” (*Birth of Homeopathy*, Introduction, location 162, par. 13). Hufeland is

medical practice by promoting the foundation of a new remedial system, Hufeland celebrated Hahnemann's developments and was hopeful about homeopathy's potential to effectively prevent epidemics without risking the lives of those in need of protection. Despite its documented success during times of epidemics and the promising precedent it established for the politics of public health interventions, Hufeland's reservations were later confirmed and homeopathy never rose to prominence as Hahnemann had hoped. By extension, the political implications of the homeopathic prevention of infectious disease remain, in many respects, an untold story.

Yet, in view of the enduring controversies that continue to plague the project of immunizing communities, it is a story worth telling. It represents an alternative trajectory to modern developments in immunology and risk analysis, which have come to define our relations with others—indeed our very existence—as an inevitable negotiation of risk. Uniquely positioned to illuminate the historical contingency of our modern understanding of immunity, this is a story that gestures towards alternative ways of living in and fostering healthy community. Indeed, more than suggest an alternative method of prophylaxis, a politico-historical reading of Hahnemann's medical innovations offers insight into a different approach to understanding and interacting with life – both individual and collective – than that operative in the modern practice

rightfully recognized for his relatively fair and balanced accounts of new medical innovations, including, for example, the introduction of vaccination in Germany (See Pfeifer, “Der Weg zur Pockenschutzimpfung” in *Medizin der Goethezeit*, 192-99). His assessment of Hahnemann's contributions to preventative medicine is accordingly valuable reading for all those interested in the history of homeopathy, whether they be critical, sympathetic, or neutral in their orientation.

of vaccination. That is, the divergent political implications of inoculation and homeopathy are indicative of an underlying incompatibility between the epistemological and ontological assumptions that, respectively, inform and are informed by these medical techniques. Stated otherwise, the differences between these two preventative strategies signal nothing less than a fundamental difference in our understanding of how we, as living organisms, live in and interact with the world and, no less radically, of how we should best navigate our limited capacity to understand these complex interactions.¹¹

From this perspective, the differences between vaccination and homeopathy can also be said to reflect the different *epistemes* in which they were developed.¹² According to Michel Foucault, an *episteme* refers to “the total set of relations that unite, at a given period, the discursive practices that give rise to epistemological figures, sciences, and possibly formalized systems” (*Archeology* 191). In other words, it refers to the fundamental epistemological assumptions that govern a particular movement in the history of ideas, assumptions that are often so basic so as to be invisible to those employing them, but that can be discovered when one analyzes them at the level of discursive regularities that occur across the sciences. In view of the

¹¹ Rather than acknowledge the philosophical discrepancies between these two prophylactic procedures, most “comparisons” of vaccination and homeopathy simply impose the epistemological and ontological assumptions operative in modern understandings of immunity onto the practice of homeopathy. See, for example, CBC's “Shot of Confusion” and “Vaccine Alternatives Offered by Homeopaths 'Irresponsible.’”

¹² Though homeopathy can not easily be classified under the *epistemes* of Classicism, the Renaissance, or Modernity that Michel Foucault describes, but rather under one that I will designate as distinctly romantic.

different epistemological assumptions operative in each prophylactic method, I will demonstrate that, although they were developed in the same year and both were advanced with a similar political interest in containing the spread of infectious disease, vaccination and homeopathy are nevertheless worlds apart. Informed by a distinctly romantic *episteme*, Hahnemann's nuanced understanding of disease etiology and, even more fundamentally, of an organism's relation to the world in which it lives, initiated a trajectory of disease prevention that diverges radically from the modern development of vaccination and its political implications.

Homeopathy and the *Episteme* of German Romanticism

Although he issued harsh criticisms against their speculative tendencies, Hahnemann's therapeutics were nevertheless strongly influenced by early German romantic philosophy and *Naturphilosophie*, both of which prompted alternatives to the reductionism characteristic of modern science. Critical of the ways in which modernity had estranged humans from the natural world and had disenchanting nature with the imposition of narrowly analytic structures, the early German Romantics¹³ sought to re-enchant nature by insisting that its mysterious forces could never be exhaustively comprehended by analytic reason (Stone, "Schlegel," 4). According to Frederick Beiser, the primary aim of early German Romanticism was social and political: "to

¹³ Among the early German Romantics, Beiser includes Friedrich Schlegel, Friedrich von Hardenberg (Novalis), Friedrich Schleiermacher, and Friedrich Schelling.

overcome the alienation and disenchantment created by modernity, and to restore unity with oneself, others, and nature.” He accordingly contextualizes all aspects of this movement – including its preference for community over antagonistic egoism and its commitment to an organic concept of nature over a mechanistic worldview – in terms of its overall goal “to cure humanity of homesickness and to make people feel at home in the world again.” Similarly, in their critique of mechanistic, materialistic, and deterministic science and its betrayal of nature's complexity, *Naturphilosophen* demanded “not merely a theoretical or epistemological shift, but a reformulation of the relation between human beings and nature, often entailing novel political or ethical commitments” (Peterson xi). In line with this trajectory, although consisting of a plurality of diverging responses to the insufficiency of inorganic sciences to illuminate living processes, one of the recurring themes that characterizes the romantic movement in the history of German medicine (ca. 1795-1840) is its recognition of the inherent interconnectedness of life.

Indicative of his place within this tradition (De Almeida 3; Handley 36; 55; Kuzniar, “Romantic Vitalism,” 165-66),¹⁴ like his contemporary romantic philosophers and physicians, Hahnemann understood the natural world as dynamic, organic, and interconnected, and focused on integrating human beings into, rather than severing them from it, an approach that directly informed his response to disease. As Alice Kuzniar observes of Hahnemann's

¹⁴ Most notably, see Kuzniar's recent monograph, *The Birth of Homeopathy out of the Spirit of Romanticism*.

romantic influences, although homeopathy may, at first glance, seem to resemble inoculation, a differentiated understanding of how health and disease affect living organisms renders these two prophylactic procedures vastly different: “homeopathy relies on opening oneself up to the slightest modification offered by the dynamized medicine, while inoculation permits one to seal off and protect oneself from susceptibility to toxic influence” (“Romantic Vitalism” 163-64). To state the difference concisely: “inoculation means developing a resistance, a hardening, or habituation, precisely in order to avoid susceptibility that is the precondition for homeopathy's effectiveness” (“Romantic Vitalism” 179). Focusing his treatment on the unique susceptibility of an organism, Hahnemann observed that when a person is predisposed to a particular disease, even the slightest exposure will be infective. More importantly, it was in view of the heightened sensitivity of people who fall ill to infectious diseases that he understood the efficacy of both preventative and remedial treatment: it is precisely those who are most vulnerable to a particular disease, he observed, who are also most responsive to a well-indicated remedy, that is, a remedy selected for inducing symptoms similar to those produced by the disease it is designed to prevent or treat. In this way, Hahnemann found a way to address susceptibility to disease by working with an organism's unique receptivity to its external environment rather than providing a form of protection that sealed it off from it. In Kuzniar's words: “if homeopathy presumes and enhances the integrity of the body, at the same

time this body is a permeable membrane” (*Birth of Homeopathy*, Ch. 3, location 2762, par. 68).

In developing his prophylactic method in view of the irreducible singularity of an organism's responsiveness to its environment, Hahnemann renounced the need to unnecessarily impose risk on individual bodies. As Kuzniar notes, “Homeopathy avoids any poisoning that allopathic medicine might generate; it also steers clear of the spectre of contamination by a nonhuman substance (actually, from the instruments used) attributable to vaccination” (*Birth of Homeopathy*, Ch. 3, location 2762, par. 68). Applying this observation to the political implications of Hahnemann's prevention of infectious disease, I will argue that he also renounced the possibility that such an allocation of risk could possibly benefit the community. Informed by German Romantics' appreciation for the inherent interconnectivity of nature, Hahnemann was predisposed to approach community health in view of an organism's relations with its external environment and to thereby promote a more fluid and porous exchange between the parts and the whole. In short: his integrative ontology of nature supported a radically different politics than that operative in the controversy surrounding vaccination and its insulating treatment of individual and community life.

Insofar as Hahnemann's attention to an organism's unique responsiveness to its external environment is inherently at odds with the calculation of risk used by proponents of variolation and vaccination – which

attempted to generalize the effects of medical intervention across the population – his method also implies a different epistemology than that operative in the distribution of inoculation. Promulgated on the basis of risk analysis and the calculation of possibilities, variolation and vaccination were implicated in the development of a narrowly analytic form of rationality that arose, generally, to demystify the secret workings of nature and, in particular, to address the corresponding problem of medical uncertainty. As such, the effort to more effectively prevent infectious diseases with ever more sophisticated mathematical calculations – however noble – was involved in the “disenchantment of nature,” a designation that Max Weber would later use to describe a world in which “we are no longer ruled by mysterious, unpredictable forces, but that, on the contrary, we can in principle *control everything by means of calculation*” (13).¹⁵ In contrast, Hahnemann, who was informed by a distinctly romantic response to the problem of medical uncertainty, sought to achieve greater precision in medical practice not through an analytic assessment of competing risks, but, rather, by cultivating the power to observe living organisms as integrated identities, a faculty that German Romantics referred to as *intellectual intuition*.

In concrete terms, rather than mathematically distribute the variables affecting health and its prevention across the population, a level at which they could be better comprehended by analytic rationality, Hahnemann sought to

¹⁵ To read more about the early German Romantics' commitment to the re-enchantment of nature and how their work anticipates Weber's account of disenchantment, see Stone's essay, “Friedrich Schlegel, Romanticism, and the Re-enchantment of Nature.”

improve his capacity to recognize the unique susceptibility of an organism to its external environment. And, as we will see, during epidemics, he extended this method of observing individual organisms to the community as a whole. That is, his method of selecting an appropriate remedy for all those infected by a circulating disease required the capacity to recognize across the differences of each and every unique symptom picture an underlying unity. In this way, his method reflected what Dalia Nassar identifies as the romantic conviction “that nature as an integrated nexus is a unity that emerges only *in and through difference*” (*Romantic Absolute* 3). Opposed to the standardization of medical practice that was occurring during his lifetime (Kuzniar, *Birth of Homeopathy*, Ch. 2, location 1195, par. 4), Hahnemann's response to community health provides a striking example of the Romantics' sophisticated understanding of unity, that is, a unity that “is not abstract or general, but concrete and internally differentiated” (Nassar, *Romantic Absolute*, 4).

Hahnemann's method of observing organisms – both singular and social – as differentiated unities is essential to understanding not only the political significance of his romantic influences, but also the coherence of his work. Otherwise it is difficult to reconcile, on the one hand, Hahnemann's unprecedented attention to the individual organism with, on the other hand, his relatively uniform method of preventing infectious disease. As Kuzniar observes in *The Birth of Homeopathy Out of the Spirit of Romanticism*, Hahnemann “believed in the specificity of each individual” (Ch. 2, location

1279, par. 10), a conviction that she identifies with the ideals of romanticism, which “defended uniqueness, celebrated individuality, and admired irreducible integrity” (Ch. 2, location 1333, par. 13). From this perspective, she emphasizes Hahnemann's criticism of allopathic medicine “for attempting to reduce separate manifestations of an illness to one cause, whereas he saw each discrete case as distinctive. He swore that it was always the person with the disease who must be treated, not the disease itself” (Ch. 2, location 1350, par. 15).¹⁶ Recognizing the way in which Hahnemann's insistence on the individuality of each ailment directly relates to his call for physicians to be as sympathizing and attentive as possible (Ch. 2, location 1364, par. 16), Kuzniar argues that its emphasis on the personalization of the symptom explains both homeopathy's historical and continued success. Its move away from an earlier mechanized view of the body to focus on communicated self-attentiveness was especially appealing to Hahnemann's patients, who experienced their symptoms to be absolutely exceptional (Ch. 2, location 1517, par. 29), and its emphasis on individuality remains favourable to many “even today in a health-

¹⁶ While Kuzniar remains nuanced in her position, Wischner rightly observes that the biggest mistake in the reception of homeopathy is the belief that in homeopathy there are no diseases, only diseased people (104). Wischner insists that Hahnemann never formulated such a statement and that in view of Hahnemann's understanding of fixed diseases (“festständigen Krankheiten”) there is no doubt that he had an understanding of real, existing, diseases (105). Hahnemann provides a concise summary of his nuanced understanding of disease in his “Essay on a New Principle for Ascertaining the Curative Powers of Drugs”: “Now, when I entirely deny that there are absolute specifics for individual diseases, in their full extent, as they are described in ordinary works on pathology, I am, on the other hand, convinced that there are as many specifics as there are different states of individual diseases, *i.e.*, that there are peculiar specifics for the pure disease, and others for its varieties, and for other abnormal states of the system” (260-61). For a helpful summary of Hahnemann's understanding of the dual nature of disease, see Decker and Verspoor, “Chapter 7: Two Approaches to and Two Types of Specific Remedies for Disease” in *The Dynamic Legacy*.

care environment where the allopathic practitioner rarely spends over ten minutes with a client” (Ch. 2, location 1444, par. 22).

Yet, during his lifetime, Hahnemann enjoyed the greatest gains in popularity following his documented success with epidemic diseases, which decidedly did not emphasize the irreducible singularity of each and every individual's unique manifestation of symptoms. Following his treatment of epidemic typhus in 1813, for example, Hahnemann's consultations grew fivefold within four months (Jütte 57). He similarly received increased recognition, including from government officials, in 1831 for his recommendations on how to prevent and treat cholera, so much so that his pupil Karl Julius Aegidi celebrated the disease for its role in “increasing the love of homeopathy” (qtd. in Jütte 90). According to Ameke, “[a]ll the evidence points to the fact that the spread of homeopathy increased rapidly during and after the cholera; the self-reliance and confidence of the homeopaths grew, and the irritation of their opponents reached the highest pitch” (249).

In contrast with his attention to the way in which chronic diseases find unique expression in each and every individual and so require an individualized approach to remediation, in his treatment of epidemic diseases, Hahnemann selected a remedy based on its similarity to the *disease itself*, recognizing its underlying unity despite the various ways in which it expressed itself in different people.¹⁷ As he notes in “The Medicine of Experience”:

¹⁷ Acknowledging that there are a few exceptions to Hahnemann's insistence that all diseases are dissimilar and innumerable, Kuzniar turns to his later views on the inherited chronic diseases, which he considered to be generalizable diseases, as a possible counter-example. Yet even here, Kuzniar

We observe a few diseases that always arise from *one and the same* cause, *e.g.*, the miasmatic maladies; hydrophobia, venereal disease, the plague of the Levant, yellow fever, small-pox, cow-pox, the measles and some others, which bears upon them the distinctive mark of always remaining diseases of a *peculiar character*; and, because they arise from a contagious principle that always remains the same, they also retain the same character and pursue the same course, excepting regards some accidental concomitant circumstances, which however do not alter their essential character (440).

Based on this insight, Hahnemann generally prescribed a single remedy, or a limited set of possible remedies, whether prophylactically or curatively, for all those affected by a particular epidemic disease.¹⁸ Yet, as I will later detail, his transition from the individual to the community involved neither a generalization of risks nor a standardization of demographics, but rather a

notes, “he believed in the poly-etiology and individuality of illness,” concluding that “[c]learly, Hahnemann's entire system of homeopathy is founded on [the] personalization of the symptom” (*Birth of Homeopathy*, Ch. 2, location 1444, par. 22). It is, however, not immediately clear how she would fit Hahnemann's treatment of epidemic diseases into this system, where remedies are not based on the personalization of the symptom, but rather selected in light of their similarity to the disease itself. This aspect of homeopathy may prove illuminating in view of the “marked discrepancy” that Kuzniar identifies when she compares Hahnemann's theory to individualize each patient's case with his case notes (*Krankenjournal*), in particular with instances in which he prescribed a single remedy to all visiting patients. According to Kuzniar, the high rate of occurrence with which the same remedy was given simultaneously to several patients raises the question of “whether Hahnemann's praxis was truly tailored to the individual” (*Birth of Homeopathy*, Ch. 2, location 1538, par. 22).

¹⁸ For a detailed overview of Hahnemann's distinction between fixed and transient diseases, see Wischner, “Die Lehre von der Krankheiten,” *Fortschritt oder Sackgasse*, 75-147.

method of observing symptoms concurrently at the levels of the individual and the community. In this way, his attention to the health of the population remained inextricably bound to the lived experiences among the multiplicity of individuals that populated it, a feature that bodes well for the affirmative potential of romantic biopolitics.

Overlooking the political significance of an approach to community health that implements the Romantics' differentiated understanding of unity and the relation of the part to the whole, traditional historiography has generally treated the German romantic movement "like a pariah among the medical-historical episodes" (Galdston 346), a warning of the violence that occurs when medicine is divorced from empiricism and is lost in a philosophical play of empty phrases. More recently, however, a more nuanced understanding of the important role that observation played for the Romantics, along with a greater appreciation of the ways in which more empirically-oriented physicians, such as Hahnemann, were influenced by the romantic ideals of their contemporaries, has problematized such dismissive readings of this unique chapter in the history of medicine.¹⁹ Moreover, a sobering recognition of the limitations of modern medicine, especially in the fields of psychiatry and immunology, has revived interest in romantic medicine (Tsouyopoulos, "German Philosophy" 345). As Iago Galdston affirms, "the recognition which the Romantics shared in common, of the linkage of man to

¹⁹ See, for example, Nassar, "From Philosophy of Self to a Philosophy of Nature" and Tsouyopoulos "Schellings Konzeption der Medizin als Wissenschaft."

the universe and of the universe to man” (361), has promising implications for the practice of medicine. By extension, a deeper understanding of the inherent interconnectedness of living organisms and the natural world stands to provide a necessary corrective to our modern isolation in a risk-laden world.

A Romantic Remedy for a Biopolitical Problem

Inspired by this revived interest in German romantic medicine, I turn to a medical practice brought forth by this tradition – homeopathy – in response to an enduring problem in the contemporary study of biopolitics, a problem brought to the fore in the question of vaccination but certainly not confined to it: is it possible to protect life without inadvertently endangering it? More affirmatively, I outline an alternative politics of life that emerges from the German romantic tradition of medicine – operative in the homeopathic prevention of epidemics – in order to challenge the seeming inevitability of biopolitics' reversal into an instrument that indirectly puts the life it is designed to protect in peril and that thereby problematizes the relationship between the singular and the social.

Biopolitics, the political management of *life* at the level of the population, is beset by a tragic paradox: the ability to regulate the vitality of a population has been historically linked to an increasingly sophisticated administration of *death*. This seemingly insoluble problem has haunted thinkers since Foucault introduced it in his analysis of the emergence of

biopower, that is, the rise of the modern state's hold on life, its "acquisition of man insofar as man is a living being" (*Society* 239). Foucault's analyses highlight the myriad ways in which the state's ability to regulate and enhance the vitality of a population are inextricably related to its capacity for increasingly all-encompassing administrations of life to the point of control over its death. As he presents it, biopower acquires its capacity for violence by isolating bodies, both individual and collective. More specifically, biopower gains control over life both by segregating a multiplicity of individuals into distinct bodies that, through various processes of normalization, can be monitored and controlled, and by massifying that multiplicity into a population that can be surveilled and influenced. While this process of subsuming the biological under state control enables a more efficient management and, in many cases, enhancement of life, Foucault warns that it also results in a potentially violent disconnect between the 'population' as an object of analysis and intervention and the multiplicity of individuals. When the 'population' is divorced from the multiplicity that populates it, he observes, it becomes possible to legitimize the sacrifice of certain lives in order to safeguard the life of the population as a whole. In this way, by seizing life, in both its singular and social forms, and severing it from its living context, biopower engages not only in the protection of life, but also in its demise.

In view of the simultaneously protective and destructive capacities of enclosing life from its (at times threatening, at other times nurturing)

surroundings, a number of contemporary thinkers interested in developing approaches to life that offer protection without sacrifice resist the isolation and insulation of living organisms by emphasizing their inherent interconnectivity and mutual vulnerability.²⁰ Others attempt to rescue the multiplicity of individuals from the stifling homogeneity of “the population” by emphasizing the diversity of community and the irreducible singularity of its members.²¹ In this way, several recent contributions in the field of biopolitics resonate with the project of German Romanticism: they respond to the potential for biopolitical violence by supporting approaches to life that promote more open and fluid exchange across nevertheless protective and differentiating boundaries.

And yet, despite these important points of convergence, “[r]omanticism occupies an ambivalent position in the most influential contemporary theoretical accounts of biopolitics.” As Alastair Hunt and Matthias Rudolf observe, although romanticism appears at a pivotal moment in the history of biopolitics, especially in the British and German traditions, biopolitical theorists have consistently overlooked romantic contributions. Tracing this tendency within biopolitical thought back to its founder, they note that, “while Foucault locates the emergence of biopower at the ‘threshold of modernity’—the very historical moment punctuated by the emergence of romanticism—his historical

²⁰ This list includes, among others, Roberto Esposito, Donna Haraway and Judith Butler, and is exemplified by the ‘posthumanism’ turn in the contemporary study of biopolitics. See Cary Wolfe, “The Biopolitics of Posthumanism.”

²¹ This approach is epitomized by the work of Michael Hardt and Antonio Negri, in particular their notion of “the multitude” as “a set of singularities” (*Commonwealth* xiii).

analyses circumvent romanticism.” Faced with “symmetrical views of the same terrain – the view of biopolitics without romanticism, and the view of romanticism without biopolitics” – they encourage scholarship that explores “the implications of the biopolitical problematic for romanticism.” Without denying the importance of this pursuit, in the following work I reverse this emphasis and instead consider the equally important implications of romanticism for the biopolitical problematic. While the former approach is admittedly more compatible with the critical orientation of biopolitical study, I find the latter to be more resonant with the effort to trace the contours of an affirmative politics of life. I maintain that the endeavor to establish a life-giving basis for biopolitics requires more than a critical problematization of contemporary and historical interventions into life; it also demands of us the courage to posit – however tentatively – an alternative method of engaging with life.

While I find many aspects of German Romanticism – in particular its ethics, aesthetics, ontology, and epistemology – relevant for addressing the challenges at the heart of biopolitics, in the attempt to most directly respond to the concerns raised by Foucault's analyses of biopower, I hone in on how these philosophical contributions are operative in a historically-situated medical technique that arose out of this movement. As Maren Klawiter observes, in Foucault's account of biopower, medicine is “a particularly dense point of transfer within the modern circularity of power” (23). More specifically,

Foucault's interest in how biopower functions to both subjugate bodies and control populations leads him to interrogate how the isolating mechanisms of modern medicine are operative in both its clinical and public health applications. The genealogy of biopower's grip on the body can be traced back to the rise of scientific medicine or what Foucault termed the "clinical gaze" and its control over the population back to the modern apparatus of public health, or what might be called the "epidemiological gaze" (Klawiter 23). To this end, his work focuses on dominant trends in the history of clinical and public medicine that highlight power's tendency to isolate and control life, sometimes even to the point of death. But there is a rich plurality of other developments in the history of medicine that remain unmentioned in his historical-political analysis, developments – such as those emerging from the romantic tradition that he consistently overlooked – that designate life without divorcing it from its living context and that postulate community without eroding the unique singularity of its members. Such developments, by extension, suggest alternative outcomes to his reading of the rise of modern biopower. As Foucault himself observes, "among the cultural inventions of mankind there is a treasury of devices, techniques, ideas, procedures, and so on, that cannot exactly be reactivated, but [that] at least constitute, or help constitute, a certain point of view which can be very useful as a tool for analyzing what's going on now—and how to change it" ("Afterword" 236). In other words, "understanding the immense array of possible historic and

present alternatives provides the only way of making an informed choice about the technologies and techniques in which one can participate” (Gerrie).

In view of the extensive range of medical interventions available in the history of medicine, the biopolitical question guiding this study – namely, how does the relationship between the multiplicity of individuals and the collectivity of the population either enable biopower's potential for violence or provide a safeguard against it? – prompts me to focus on the prevention of epidemics. Highlighting the political nature of infectious disease prevention, Ed Cohen notes that the very word 'epidemic' (meaning “among the people”) derives from the Greek word *demos*, a term that, in contrast with 'epizootic' (derived from *zoon*, meaning “nonpolitical animal life”), denotes a geopolitical district. He reasons that “if 'epidemics' presuppose that illness carries significance as *a political form of life*, then defining immunity as exemption from such epidemic illnesses concomitantly frames it within the same biologic” (176). When political leaders assume the task of immunizing individuals, especially when the immunity in question is against endemic life-threatening diseases, they act precisely as a political sovereign does, defining those whom it exempts from otherwise binding laws. Cohen argues that “if we remember that Foucault characterizes the political sovereign as the one who bears the ‘right to take life or let live,’ then immunity in both its political and medical valences evinces such a power” (176). In other words, prophylactic interventions against infectious diseases are, by definition, political interventions. They “go

to the heart of the social contract, requiring a determination of where the line runs between the interests of the individual and those of the community” (Baldwin 563).

Reinforcing the foundational role that the prevention of epidemics played in the modern rise of biopower and the formation of the nation state, in his comparative reading of various European states' responses to infectious disease between 1830 and 1930, medical historian Peter Baldwin remarks that it is not immediately clear whether “prophylaxis is a continuation of politics with other means” or whether “politics were shaped by the imperatives of prevention” (2).²² What is clear, however, is that the precise ways in which the lines of distinction are drawn between the singular and the social organism vary among different prophylactic methods. Not all preventative health strategies position the individual and community in antagonistic relation to each other – such that the survival of the one threatens the well-being of the other – and, by extension, not all methods of protecting life run the risk of inadvertently endangering it.

According to Baldwin, “over the *longue durée* of western thinking about diseases and their causes” (9), it is possible to distinguish between “a focus on the environmental background of epidemic disease [miasm theory] and its transmissibility among humans; prophylactically, between attempts to

²² For his part, Baldwin convincingly concludes that:

It was not British liberalism or German interventionism (to take again the outliers) that, by themselves, determined prophylactic strategies, but the imperatives of geoepidemiology, and the associated factors identified here, that helped shape not only the preventive precautions they encouraged, but indeed the very political traditions of these nations (563).

ameliorate toxic surroundings and limiting contagious spread” (9).

Acknowledging that a strictly binary view of either disease etiology or prophylaxis would be a distortion (7) – in fact strategies to prevent or contain the spread of infectious disease were multiple and mutually permeable – he nevertheless finds it helpful to maintain the distinction in view of the respective political implications of each prophylactic approach. At its broadest, Baldwin summarizes:

this etiological distinction separates, on the one hand, a view of disease as an imbalance between humans and the environment whose prevention requires a reequilibration from an understanding, on the other, of illness as the outcome of a specific external attack on the autonomous integrity of the body, which, if not preventable (by vaccination) or curable through various targeted medical manipulations, can at least be rendered innocuous, from the community’s point of view, by ensuring that the victim does not infect others (16-7).

He observes that, generally, an environmental understanding of disease etiology and a corresponding emphasis on sanitary reforms were considered liberal, allowing for freedom of movement (and trade!) and freedom from invasive medical intervention. Those who emphasized the importance of separating sewage from clean drinking water, for example, and providing more spacious housing and nutrient-dense food, often prided themselves on

demanding “no costly tradeoffs between the respective interests of the individual and community” (14). In contrast, prophylactic methods designed to interrupt the transmission of diseases, whether through inoculation or quarantine, were often thought to involve “violations of the freedom and bodily integrity of those feared as infectious, subordinating the (afflicted) individual to the interests of the community” (18).

As we will see, although Hahnemann emphasized the importance of environmental and lifestyle considerations in the prevention of epidemics and insisted on the immateriality of disease, it is obvious that he was nevertheless partial to the transmission theory of contagious disease (Jütte 89).²³

Acknowledging that some instances of acute diseases (or acute flare ups of chronic diseases) are the result of individual predisposition or external influences, in the *Organon* he also identifies others that are 'epidemic,' that is, contagious diseases that seize many people and illicit similar symptoms in each and every one of them (§73).²⁴ His commitment to the transmission theory of disease is especially evident in his writings on cholera, in particular, in his “Appeal to Thinking Philanthropists Respecting the Mode of Propagation of the Asiatic Cholera.”²⁵ Here Hahnemann explicitly denounces the theory

²³ See also Wischner, “Die Lehre von der Krankheiten,” *Fortschritt oder Sackgasse*. 75-147.

²⁴ Unless indicated otherwise, all references to Hahnemann's *Organon* refer to the sixth and final edition.

²⁵ Providing an earlier example of Hahnemann's preference for the transmission theory of disease, Robert Jütte notes that although other eighteenth-century physicians thought that scabies was caused by “small living insects or mites,” this did not immediately impact their choice of treatment: “The traditional doctrine of the four humours as well as a number of ineffective home remedies continued to prevail, while Hahnemann was the only one to recommend, as early as 1792, the use of sulphur solutions to destroy the mites” (84). Kuzniar emphasizes that “Even in an era before Rudolf Carl Virchow's (1821-1902) germ theory of disease and the ensuing drills of quarantine, disinfection, and

that the disease is spread through an “atmospheric-telluric nature” in favour of the conviction that it is “communicable by contagion only, and propagated from one individual to another” (756).

Presenting a relatively nuanced understanding of disease transmission that some consider to be prototypical of modern germ theory and immunology (Scheible 54-9), Hahnemann criticizes the faulty conclusion that, since some individuals do not fall ill to the disease, that it is therefore not contagious. He considers it a “wonderfully benevolent arrangement of God” that it is “possible for man to fortify himself against, and render himself unsusceptible to, the most deadly distempers” that is, “if he gradually approaches it” and “has an undebilitated body” (759). But he chastises physicians and nurses who boast, in light of their capacity to treat sick patients without themselves falling ill, that the disease is therefore not contagious. He considers this assertion to be “presumptuous, inconsiderate, and perfectly untrue,” and, more critically, one that has “cost thousands of lives” (760). After all, he argues, when such physicians and nurses, themselves fortified against the disease, leave the patient:

they take away with them in their clothes, in their skin, in their hair, probably also in their breath, the invisible (probably animated [wahrscheinlich lebendigen]) and perpetually reproductive

sterilization, he counseled against kissing others, handshaking, drinking from their glass, and using their toilet” (*Birth of Homeopathy*, location 317, par. 27). See also Hahnemann's writings on “The Visitor of the Sick” and “Protection Against Infection in Epidemic Diseases” in “Friends of Health” (1792).

contagious matter surrounding the cholera patient . . . and this contagious matter they unconsciously and unsuspectingly carry along with them throughout the town and to their acquaintances, whom it unexpectedly and infallibly infects, without the slightest suspicion on their part of its source (760).

From this perspective, he considers physicians and nurses to be “the most certain and frequent propagators and communicators of contagion far and wide” (760). He accordingly pleads to all “thinking philanthropists” to accept the transmission theory of contagious disease and, by extension, to adopt methods that interrupt the circulation of disease.

As indicated by his harsh condemnation of those whose ignorance exposes others to infection, Hahnemann recognized the responsibility that individuals – especially physicians²⁶ – have to others in their personal management of contagious disease. In other words, his approach to communicable diseases was not one that heralded the rights and freedoms of individuals over the security of the community. And yet, I will argue, although he aligned himself with the transmission theory of disease, his approach to prophylaxis also did not subordinate the health of the singular organism to that of the social. His distinctly romantic method of observing organisms enabled him to recognize the inherent inextricability between the multiplicity of individuals and the community. From this perspective, what is most

²⁶ Hahnemann also describes a similar pattern in sailors who, after building resistance to cholera onboard, expose susceptible individuals to the disease when they return to land.

illuminating about Hahnemann's development of homeoprophylaxis is the way in which it develops so closely alongside the modern prevention of epidemics – most notably vaccination – and yet consistently diverges on precisely those points that impact its implications for community relations.

Insofar as I trace the seemingly insoluble controversies in the vaccine debate over the interests of the individual versus those of the community back to the statistical distribution of risks, I am interested in the potential corrective provided by Hahnemann's commitment to developing a method of prophylactic intervention that follows the medical maxim to first do no harm, *Primum non nocere*.²⁷ While it is impossible to predict all possible side effects of a medical intervention, this mandate challenges physicians to refrain from any procedure that has demonstrated its capacity for harm, whether imminent or long-term, inadvertent or intended, even if it is to avert a potentially greater, future harm. It was cited as one of the main medical objections that arose in response to variolation, and later, vaccination, that could not be addressed by the calculation of risks that ultimately justified the admission of inoculation into

²⁷ Though this maxim is often attributed to Hippocrates, more recent studies suggest that the author was neither Hippocrates nor Galen. One of its first uses in English has been traced back to a book by Thomas Inman, *Foundation of a New Theory and Practice of Medicine*, published in 1860. Inman attributes the aphorism to the famous English physician, Thomas Sydenham (1624-1689): “Lest it should be objected that our opinions are new-fangled, and therefore unworthy of credence, we crouch under the cloak of Sydenham, and say, that our motto is none other than [sic] a translation of his Latin aphorism respecting a physician's duties, viz.: – “*Primum est ut non nocere*” (qtd. in Smith 372). Inman, however, does not provide an explicit citation or reference and the aphorism has not yet been located in Sydenham's works or biographies. Others trace the expression back to Worthington Hooker, who introduces the concept in 1847, attributing it to the oral teaching of a Parisian pathologist, François Chomel: “The golden axiom of Chomel, that it is only the second law of therapeutics to do good, its first law being this – not to do harm – is gradually finding its way into the medical mind, preventing an incalculable amount of positive ill” (qtd. in Smith 374). For a detailed discussion on the history of this concept, see Smith.

mainstream practice; it could only be overridden. It accordingly provides a baseline against which to consider the particular problems that surround the decision to vaccinate. It also provides a strategy for opting out of the logic of risk analysis employed to legitimize the practice of vaccination, preserving the possibility that medicine can effectively prevent disease without actively introducing harm to the organisms that it serves to protect. In this way, it denies the foreclosure of alternative strategies that is implied in the risk analysis of vaccination, which suggests that there are no options outside of the risks of infectious disease and prophylaxis: one risks either the side effects of vaccination or the complications associated with the diseases they are designed to prevent.

Thomas Osborne identifies the rise of modern public health policy – the penultimate expression of modern biopolitics – with the opening of a gap between the two terms of 'health' and 'policy,' that is, “when the relation between them was implicitly acknowledged to be dogged by a certain indeterminacy” (“Health and Statecraft” 178). One response to the problem of medical uncertainty, a response that Foucault emphasizes, lead to the calculation of probabilities and the rationalization of risk that helped usher inoculation into mainstream practice. It also gave rise to the problematic disconnect between the population and the multiplicity of individuals that we have come to associate with the violent inclinations of modern biopolitics. But this was not the only response. Heavily influenced by Immanuel Kant (1724-

1804), the romantic movement in German medicine developed radically different ways of addressing the problem of medical uncertainty than those representative of the English Enlightenment. Reluctant to accept the limits of finite rationality, they denied the supremacy of discursive thought and developed other, more intuitive, approaches to grasping organisms as they are engaged in living processes. The Romantics' responses generated an understanding of our relationship with the organic world – including the world of infectious disease – that was defined, not by risk, which spurs the erection of impermeable boundaries and the annihilation of the other, but by fluid and open interchange. I accordingly turn to a historically-situated public health practice ushered forth by this tradition to consider the alternative strategies it developed to reconcile the needs of the individual with the demands of the community in the prevention of communicable diseases.

In response to the many current theses that attempt to identify the origins of modern biopolitics, I emphasize that there are multiple medical technologies that take life as their object. More specifically, I recognize, in the German Romantics' treatment of life an overlooked alternative to the 'biopolitics' that Foucault identifies with modernity. I contend that the problems at the heart of modern biopolitics must be approached in view of the latter's complex origins: instead of *affirming* the inextricable relationship between a politics of life and a politics of death, I *challenge* it by presenting a historical alternative.

The Politics of Risk

By approaching the politics of prevention in view of the risk factors that a particular prophylactic method may or may not introduce, I hope to find a more accurate indication of the relationship between the individual and the community than is evident in the political or state ideology used to promote it. I contend that the competing ideologies used to legitimize a prophylactic strategy do not change that strategy's political implications unless they also address the risk factors involved. In other words, the divisive ways in which the allocation of risk organizes social relations cannot be resolved by presenting it in a more compelling way. In the case of immunization, a mercantilist concern for the interests of the late absolute regime was used early on to promote variolation and vaccination; proponents argued that this procedure promised to increase the population and thus the wealth of the state. Later, enlightenment philanthropy and considerations of the common good played a major role in legitimizing this medical intervention (Baldwin 246; Huerkamp 620; Maehle, "Conflicting Attitudes," 205; and Wolff, *Einschneidende*, 12). More recently, the assumption of risk assumed by those who elect to undergo vaccination is promoted by an ethics of altruism (Biss 21-2). But how do these various ways of *legitimizing* the burden of risk resolve the fundamental way in which the *insertion* of risk into the public health enterprise problematizes the relationship between the individual and the community? Were we to confine our criticisms to the mercantilist argument in

favour of immunization because of its explicit compromise of the multiplicity of individuals for the sake of the whole, we would miss the ways in which the same problem continues to plague the decision to vaccinate even when it has been reframed in the more socially acceptable language of altruism.

By focusing on the risks associated with vaccination rather than on the political legitimization of these risks, I also distinguish my historical account from those that deem the most pertinent political issue that arises in the practice of immunization to be whether or not its administration is mandatory or compulsory. I contend that such readings fail to address the subtler ways in which power operates. They nevertheless abound. According to Baldwin: “For smallpox, the extremes varied between the compulsory system of universal vaccination and revaccination imposed in Germany . . . and the British government's inability to maintain similarly strict measures in the face of widespread protest, its adoption of a purely voluntary approach” (11). Mandatory vaccination is typically associated with the readiness to sacrifice individual liberties to the communal good, a position epitomized by the German medical police; whereas England's preference for voluntary vaccination is considered liberal in its concern for the civil rights of even the infectious (529). Reinforcing the traditional dichotomy between liberal England and police-minded Germany, analyses that focus exclusively on legislation fail to address the critical fact that non-compulsory —that is, voluntary— vaccination often proved to be just as effective, if not more so, than mandates

enforced by law. After all, insofar as Britain's interventionist policies differed from those pursued on the continent, they were certainly not developed with the hope of doing nothing. They were, rather, selected with the promise of being “equally, if not more, effective than the drastic alternatives” (531). That is, prominent policy makers in Britain believed that, in the long run, voluntary preventative measures would achieve more than harsh compulsion. And, as Baldwin observes, seen from a longer historical perspective, this prediction turned out to be quite accurate. Indeed, the British prophylactic response to contagious diseases “has proven to be the one eventually adopted by most other nations, however different their starting points” (531).²⁸

Finally, by assessing the divergent political implications of vaccination and homeopathy in terms of risk rather than in terms of the discourse used to navigate between individual rights and the collective good, I am also holding out the possibility that a medical intervention need not bring singular and social organisms into conflictual relations. From this perspective, I believe both pro-individual and pro-community arguments concede too much. I accordingly hope to problematize the tendency for both sides of the vaccination debate to deepen the severance between the interests of the

²⁸ This pattern can also be found in the United States. As James Colgrove notes, one of the most counterintuitive aspects of the history of vaccination in the United States, “given the early use of legal enforcement to protect against smallpox and the extensive network of laws currently in place, is that throughout the middle of the twentieth century, health officials relied very little on coercion. The preference for persuasion was rooted partly in respect for the principles of liberty and autonomy that have occupied such a central position in American civic and political life. Equally important were pragmatic reasons. Laws enforced through schools would distract from efforts to protect infants, health officials believed, while attempts to force adults would provoke potentially violent resistance. Above all, persuasion was felt to be a surer source of behavior change” (5-6).

community and those of the individual. As Foucault astutely observes, it is as futile to pit the rights of the individual against the state as it is to subordinate the individual to the needs of the population (“Omnes” 254), since both responses reinforce the units of life that biopower controls, or perhaps more precisely, the bodies through which power gains access to life. Indeed, throughout the long and polarizing conflict between the “pro-” and “anti-” vaccine positions, the boundaries between the individual and collective body have been reinforced, with both sides reifying a monolithic body while remaining quick to point out the contradictions that emerge when their opponents do the same.

As some early anti-vaccine protestors observed, by identifying and targeting individual bodies as the locus of disease, the use of vaccination as a public health strategy breaks with a long medical tradition that approached disease as an imbalance with the environment rather than a specific external attack on the body. In contrast with public hygiene methods that focus, for example, on providing clean drinking water, effective sewage clearance, and spacious housing, vaccination promises to “localize its protocols around the individual body to produce aggregate results within the population as a whole” (Cohen 87). In this way, although those in favour of vaccination often tend to emphasize the common good, denying that a decision that affects public health should be left to individual conscience, the efficacy of this medical procedure relies on the cooperation or coercion of individual bodies insofar as

they are identified as vehicles of contagion. More recent critics have also pointed out that the early hope that vaccination could provide lifelong immunity was based on the false assumption that immunity is a state that can be attained after a single clinical event rather than through ongoing exposure to pathogens. Overlooking the critical importance of continual exposure to “offending agents” in the development of robust disease protection, “immunity” was falsely conceived as a state achieved in and by individual bodies rather than through an ongoing symbiotic, open exchange between bodies and their environments. Similarly, the principle of herd immunity, often used to emphasize the porous relations between individual bodies, presupposes the existence of a closed community that has to defend itself from external threats in the form of reimported pathogens and internal threats in the form of susceptible community members. Herd immunity, or community immunity, we are told, acts as a protective barrier to shield susceptible bodies from infection.

And yet, despite their reliance on a conception of closed organisms both individual and collective, those in favour of vaccination are usually keen to point out the inconsistencies that arise when such delineations are drawn by their opponents. More specifically, they criticize those who willingly “free-ride” on the “herd immunity” established by their community, claiming that this ill-conceived decision entertains the false belief that individuals are somehow not part of the public. By making a special exemption of themselves, they argue,

such individuals perpetuate an illusion of independence—as if the health of our bodies is not always dependent on choices that other people make (Biss 127-29).

On the other hand, while many early anti-vaccine activists typically advocated a more environmental and social approach to medicine, one that emphasizes the fluidity between individuals and their surroundings, many resisted compulsory vaccination by emphasizing the integrity of the human body, drawing a firm boundary between where their flesh begins and where the realm of legitimate state intervention ends.²⁹ Feeling the need to defend themselves against state coercion, many equated the “common good” with state interests in order to demonize both without addressing how individual interests could possibly coincide with those of the community. A notable exception to this line of argument was made by those who decried the violence of medical science in general and so did not need to pit the individual against the collective—they simply denied that the “cuttings and maimings” involved in vaccination could possibly be for the public good. By focusing on the damage caused by vaccination, many anti-vaccine voices could also gesture to the hypocrisy of a state that maintained the right of “puncturing babies” but claimed no responsibility for the outcome (Durbach Ch. 3, location 1350, par. 10). How can the decision in favour of vaccination be a social good, they would ask rhetorically, but its dangerous side effects not be a social

²⁹ In *Bodily Matters*, Nadja Durbach argues that this body politics was particularly characteristic of working-class resistance to compulsory vaccination, an aspect of the campaign that middle-class anti-vaccination leadership failed to fully address (Ch. 3, location 1677, par. 46).

burden?

As the areas of overlap between these counterpositions indicate, insofar as both pro- and anti-vaccine advocates have defended (and defined) their bodies in response to an external threat, whether it be the state's invasiveness or a virulent infection's, neither group has effectively resolved the controversy surrounding the question of vaccination or, more generally, the paradoxes at the heart of biopolitics. That is, neither offers an approach to protecting communities from infectious disease that reconciles the implicit conflict posited between the interests of individuals and those of the community. Furthermore, neither approach heeds Foucault's observation, in view of the double-pronged reach of biopower, that traditional forms of resisting against its proclivity for violence are useless. For my part, instead of engaging in this conflict, I propose to expose its contingency in view of a historical alternative. How did the insertion of risk into the project of public health give rise to the competing interests that continue to plague our medical decisions? Conversely, how did the homeopathic prevention of epidemics – which endeavored to safeguard life without introducing an element of risk – promise to mitigate the tension between the individual and the community implied in most public health interventions? Considering the seemingly irresolvable conflicts surrounding the decision to vaccinate, this genealogy can perhaps best be read as counter-history, written in opposition to the dominant historical view, which makes the present paradoxes of vaccination seem

inevitable, either by naturalizing the present or by presenting the present as the pinnacle of progress.

The (Critical) Reality of Risk

Although my analysis highlights the historically contingent ways in which the modern project of immunizing bodies designates life by allocating risk, I do not thereby adopt a strong but rather a weak social constructionist position, also referred to as 'critical realism.'³⁰ That is, I acknowledge both that hazardous phenomena exist that may harm people's health or well-being—such as infectious disease or the side effects of a prophylactic procedure—and that these hazards are either identified and designated as 'risks'—*or not*—via social and cultural assumptions. In fact, it is precisely the possibility that harmful phenomena exist whether or not we apprehend them as such that motivates my interest in biopolitics. More specifically, it is the possibility that technologies designed to protect life can produce unintended but nevertheless *real* side effects, oftentimes only ever in the distant future, unbeknownst to the key players involved, that prompts me to delve more deeply into the ways in which such technologies specifically target certain segments of the population.

In line with governmentality scholars following Foucault, I am interested in the ways in which the analysis of risk emerges historically in the context of surveillance and the regulation of populations. Accordingly, I pay close

³⁰ For a helpful summary of various positions vis-a-vis the reality of risk, see Deborah Lupton 36.

attention to the ways in which concepts of risk are constructed to encourage individuals to self-regulate and engage voluntarily in undergoing medical procedures. How does the imminent threat of infection, for example, motivate “high-risk” groups to voluntarily line up for an untested vaccine, perhaps even more efficiently than more direct forms of coercion? How does the theory of herd immunity extend the assumption of risk by discouraging individuals’ refusal of vaccines for reasons of personal conscience and promoting instead a principled, active acceptance of vaccination’s risks, all in the name of altruism?

And yet, while I identify such constructions of risk analysis as a form of governance and an exertion of biopower, I maintain that our ethical evaluation of medical interventions—whether we consider them to be instances of fostering life or of systematically endangering it—rests, at least in part, on our capacity to discern the reality of the various hazards at play in various analyses of competing risks. Indeed, the act of people readily lining up for a medical procedure because they are deemed to be at high risk of infection has radically different implications depending on the actual imminence and virulence of the infection, their actual susceptibility to infection, and the actual safety and efficacy of the prophylactic intervention. Foucault correctly defines the capacity to kill in the biopolitical context not simply as “murder as such,” but also as “every form of indirect murder: the fact of exposing someone to death, increasing the risk of death for some people” (*Security* 256). From this

perspective, in order to address biopower's proclivity for violence, I find it imperative that we acknowledge the reality of the hazards that it imposes on us.

That said, although I recognize the existence of a social and natural world independent of human perception, I also acknowledge that human knowledge of reality is always fallible and incomplete, especially in the face of risk, which is inseparable from ideas of probability and uncertainty. As Anthony Giddens observes, “[a] person can't be said to be running a risk where an outcome is 100 per cent certain” (*Runaway World* 22). The inherent uncertainty of risk is further complicated in the field of medicine where, we often try to reduce risks that negatively affect our health as much as we can (*Runaway World* 24).³¹ In this case, not only is our response to risk informed by our perception of it, but our actions actively change its ontological status. That is, divergent reactions to the same risk produce multiple, varying results. In view of this future-oriented nature of risk, I find it imperative that we always consider the ways in which our management of risks is constituted by preexisting knowledges and discourses. What we consider to be a risk and what is in fact a risk are determined by our arsenal of possible responses, which is, by definition, limited. Thus, while it may be meaningful to speak about the objective reality of certain risks—for example, whether or not an

³¹ In this way, my position closely resembles that advocated by Ulrich Beck, who seeks to integrate what he sees as the two major approaches to interpreting risk: “natural-scientific objectivism about hazards” and “cultural relativism about hazards,” into what he calls “a sociological perspective.” For a summary of this integration and how it fits into other approaches to risk, see Lupton 62-3.

infectious disease is circulating throughout a susceptible community—I contend that insofar as a risk is only ever an unrealized potentiality, one that we try to avoid or mitigate, no matter how precise or sophisticated our instruments of measurement may be, a single objective assessment of risk is always beyond our grasp.

Reinforcing my observation that various responses to risk give rise to myriad possible outcomes, I would like to explicate another philosophical conviction guiding this study, namely, that the reality brought into being by multiple medical technologies is plural. Following Anne-Marie Mol, I agree that *ontology* is not just “given in the order of things, but that, instead *ontologies* are brought into being, sustained, or allowed to wither away in common, day-to-day, sociomaterial practices. Medical practices among them” (6-7). Stated succinctly: “If it is not removed from the practices that sustain it, reality is multiple” (6). That is, vaccination and homeopathy are not only designed and developed in light of different *epistemes*; as medical practices, they also enact different ontologies and impart different politics. In the words of Cohen: “medicine secret(e)s its political import within the tissues, cells, and molecules of our flesh, where we would not usually think to look for it,” (Introduction, paragraph 77, loc. 677) making it all the more important to explicate the realities that they impose on us. From this perspective, the investigation and questioning of ontologies are “therefore not old-fashioned philosophical pastimes to be relegated to those who write nineteenth-century history,” but

rather highly topical, political, matters. After all, “[i]f reality is multiple, it is also political” (Mol 7). More concretely, in view of the various possible ways in which medical practices can be done, and the various possible realities that medical interventions can impart, we can begin to ask how they might be done *well* (Mol 7). Along with Cohen, I approach the biopolitics of modern medicine as “a matter worth rethinking” and, more importantly, I too am confident “that such a rethinking might actually lead us to imagine new ways of living, both singularly and together, which might be more healing than those that modern medicine currently offers us” (Introduction, paragraph 77, loc. 677).

Indeed, my hope is that, by exploring the epistemological assumptions governing the homeopathic prevention of epidemics *vis-a-vis* those operative in vaccination and by explicating their respectively implied ontologies of life, we might be better poised to trace the contours of an affirmative biopolitics, that is, a politics of life that does not inadvertently endanger the very life that it endeavors to protect by bringing the survival of the individual and that of the community into irreconcilable conflict with one another. Conversely, by presenting the rise of vaccination alongside a historical alternative, I intend to expose the limitations of the epistemological and ontological assumptions operative in the seemingly inevitable controversy surrounding the question of vaccination, which has become paradigmatic of the problems that plague biopolitics. In contrast with an ethical or legal response to the allocation of

risks surrounding vaccination, for example—which takes the various competing interests between the individual and the community as given in order to prescriptively suggest strategies for negotiating them—I will consider their historical conditions of possibility. More specifically, I will demonstrate how the risk analyses developed to legitimize variolation and later vaccination to the population functioned to sever the relations between the individual and the community. I will then highlight how the inevitable level of medical uncertainty that remains despite the most rigorous of calculations creates a problematic horizon for biopolitics – one in which it becomes impossible to discern whether we are effectively protecting life by prioritizing treatment to those most in need or systematically exposing certain segments of the population to undue risk. In short, I will present the seemingly insoluble problems at the heart of biopolitics as a function of a particular set of epistemological and ontological commitments.

In the first chapter of my thesis, I describe how the challenges surrounding the decision to vaccinate have become paradigmatic of all efforts to preserve life. First, I detail the ways in which the attempt to interrupt the circulation of infectious disease by preemptively imposing risk on otherwise healthy bodies raises political questions concerning the optimal relationship between the individual and the community. Then I draw on Roberto Esposito's and Jacques Derrida's reflections on immunity and autoimmunity to highlight more generally the potential for protective mechanisms to destructively turn

against the very life they are designed to protect, whether a biological or a political organism. In view of the incredible pervasiveness of this problem, I describe the ways in which biopower's capacity for self-destruction is a function of a distinctly modern ontology of life and politics. I hone in on the ultimately self-defeating ways in which the defense mechanisms of modernity isolate organisms from the otherness that threatens their annihilation. More affirmatively, I outline contemporary strategies to escape the self-destructive immunitary features characteristic of modernity by opening organisms to continuous exchange with the environment, further contextualizing my turn to the romantic medical tradition within the broader effort to find fluid and porous understandings of life that counter the modern alienation of individuals and its divisive impact on community relations.

In the second chapter, in order to consider the general historical and political conditions under which both vaccination and the homeopathic prevention of disease emerged, I present the rise of biopower as Foucault introduces it, situated in the context of modern European states' struggle for their position among other states. I outline the rise of the medical police and its interest in the health of the population as further developments of the state's explicit mandate to preserve and strengthen its power. I then consider the responses of Foucault, Esposito, and Hannah Arendt to the potential for violence that emerges when public health initiatives address life at the level of the population in ways that divorce it from the multiplicity of individuals. Finally,

I problematize analyses that attempt to distinguish life-saving public health initiatives from violent forms of medical policing by emphasizing the German, patriarchic roots of the latter and celebrating the influences that liberal English ideals of freedom and individuality had on the development of the former. In view of the many anomalies generated by this polarized reading of history, I promote a politico-historical analysis that considers the biopolitical implications of specific medical interventions in view of the risks that they actively introduce to the lives they are designed to protect, regardless of the cultural and ideological prejudices used to promote them.

Pursuing the problematic relation between the individual and the community as it developed historically in the practice of immunization, **in the third chapter** I explore the risk analyses that helped usher variolation into accepted fields of rationality by relocating risk to the level of the population, one of modern man's most effective strategies for confronting the bombardment of risks that surrounded him. First, I identify the calculus of probabilities as a response to the problem of medical uncertainty that was generally accepted in England in light of John Locke's (1632-1704) skepticism regarding our capacity to know the world. Then, drawing on Giddens' and Ulrich Beck's insights into the paradoxes that inevitably emerge in the assessment of competing risks, I expose the limitation of this epistemological approach and problematize the risk-laden ontology that it generates. More specifically, I identify how the discourse on risk, specifically the calculus of

probabilities used to promote variolation, failed to account for, let alone predict, the far-reaching implications of this preventative strategy against smallpox. In particular, I consider how the persistent yet unpredictable phenomena of waning and failed immunity problematized early attempts to accurately assess the risks assumed in the decision to acquire immunity.

In the fourth chapter, I explicate the problematic politics of vaccine distribution by highlighting how they preemptively target specific segments of the population to undergo preventative treatment and, by extension, to carry the burden of risk associated with prophylaxis. In a close reading of Foucault's 1977-78 lectures at the *Collège de France*, I show how the logic used to legitimize variolation propagated the position that in order to achieve overall improvements in health and prosperity at the level of the population, the sacrifice of certain individuals should not only be permitted, but actively encouraged. I then demonstrate, with reference to the 2009 swine flu pandemic, how the discriminating distribution of risks throughout the population perpetuates this logic of sacrifice, even if our political ideology no longer supports it.

In the fifth chapter, I consider alternative ways of navigating the problem of medical uncertainty that developed in early nineteenth-century Germany. Contextualizing the Romantic Movement in German medicine in terms of the plurality of responses that arose to address Kant's delineation of human understanding, I describe how a shared appreciation for the

interdependent receptivity between an organism and its environment unified these desperate approaches and, more importantly, how this ideal informed medical practice. In contrast with many historical readings of romantic medicine that emphasize its speculative tendencies, I focus on the important – if nuanced – role that observation played in this tradition, epitomized by Johann Wolfgang von Goethe's (1749-1832) observation of plant growth, which had a significant impact on the *Naturphilosophie* of Friedrich Schelling (1775-1854) which, both independently and by extension, facilitated the integration of the romantic ideal of intuiting organisms as integrated identities into the life and medical sciences. Finally, I detail the ways in which Hahnemann's "romantic" method of observing organisms as they were engaged in living processes and responding to external stimuli concretely informed his treatment of disease and, by opening organisms up to ongoing exchange with the outside world, how his understanding of the power that preserves life, *Lebenskraft*, suggests an alternative to the isolation often implied in modern understandings of immunity.

In the sixth chapter, I return to the political question of immunizing communities by considering how Hahnemann's romantic understanding of the fluid interaction between organisms and the external world concretely informed his attempts to prevent epidemics. I outline Hahnemann's early response to infectious disease and identify the philosophical and ethical convictions that motivated his ambivalent reception of vaccination and

subsequent effort to develop safer, more discriminating, forms of treatment. I then detail his innovations in the effort to prevent contagious disease and the affirmative reception that his prophylactic method received. Finally, I consider the political implications of homeopathy as a preventative medical technique that refrains from actively imposing risk on the lives it intends to protect, a possibility precluded by the contemporary reliance on vaccination.

Cohen warns that when we conceptualize immunity as modernity has presented it to us, that is, as primarily insular and defensive, we occlude the multiple non-defensive healing possibilities that an organism may manifest (233). By extension, we deprive ourselves of discovering different conditions of possibility for approaching the complex relationships between the individual and the community. What might we learn when we redefine our understanding of health such that it no longer denotes a defensive, risk-laden frontier but rather a vulnerable coexistence with and openness to others? How might we change “if we imagined that coexistence rather than self-defense provides the basis for our well-being” (251)?

Chapter One: The Biopolitics of Prevention

The idea that “what does not kill us makes us stronger”³² complicates what might otherwise be a straightforward goal of medicine: to promote health by preventing disease. Indeed, the very distinction between the two states of being is nuanced by the suggestion that those who survive a bout of infectious disease often enjoy more robust vitality in the form of resistance to subsequent reinfection. This form of immunity, at least historically, has been the privilege of those who have fallen prey to disease and lived to speak about it. A consolation prize for survivors, immunity was quickly recognized, in its power to protect, for its potential to transform a previous encounter with illness into a measure of future health.

But what happens when we attempt to bypass the risks associated with *natural* immunity by developing techniques to gain *acquired* immunity, that is, when the contraction of disease is no longer “an essentially passive condition [but] one that is actively induced” (Esposito, *Bios*, 7)? Despite (or precisely because of) the fact that, in the process of gaining natural immunity, people often stood to lose more than they could possibly gain, the end result was so valued that early civilizations sought to mimic this process in a more controlled setting.

Primitive practices of deliberately exposing an uninfected person to disease have been found in most early civilizations around the world where

³² “That which does not kill me, makes me stronger” (Nietzsche 38).

smallpox was endemic; it was considered a rite of passage orchestrated by parents whose children had not yet had the disease (Jannetta 10). The medicalized attempt to orchestrate a mild case of smallpox in the hopes of conveying future immunity was documented as early as 590 AD in China, where children were instructed to breathe airborne droplets of the virus through their nasal passages and into their lungs (Jannetta 11; Link x). The inoculation of non-virulent live variola virus into one or more incisions made in the skin reached Constantinople by 1679 (Kitta 8) and was popularized—albeit controversially—in Europe at the beginning of the eighteenth century. While the Royal Society of England worked tirelessly to help sway public and professional opinion in favour of variolation, it did not address all of the objections concerning the various risks associated with the practice. Such resistance persisted even after variolation was replaced in the nineteenth century, as we have seen, by Jenner's method of inoculation with cowpox, a disease similar to, though much less dangerous than, smallpox. While the relative safety of vaccination quieted some of the controversy surrounding acquired immunity, many old concerns remained and many new ones arose.

From ancient techniques of variolation, through Jenner's proposed method of vaccination, right up to contemporary practices, the history of acquired immunity is a long and complicated one. It is comprised of many disputed facts, told by strong proponents and equally fervent resisters. It is, in short, a history that raises more questions than it answers. What exactly are

the implications—politically, ethically, and socially—of deliberately orchestrating an encounter with disease in a way that attempts to favour our chances of survival?

According to the myth of Achilles, the Greek god killed by a strike to his one and only point of vulnerability, conferring immunity is a perilous task. It is “a myth . . . and no mortal can ever be made invulnerable” (Biss 8). Echoing this position of ancient Greek suspicion, Plato expresses his wariness of all medical interventions, “even when they are wielded with good intentions, and even when they are as such effective” (Derrida, *Dissemination*, 99). As Derrida observes, the very word Plato uses for a 'therapeutic intervention,' *pharmakon*, captures this ambivalence; it can just as easily be translated as 'poison,' or 'drug,' as it can as 'remedy' (*Dissemination* 71). There is by definition “no such thing as a harmless remedy. The *pharmakon* can never be simply beneficial” (*Dissemination* 99). Following Greek tradition, or, more precisely, the doctors of Cos, Plato maintains that the *pharmakon* is essentially harmful because it is artificial. It is thought to go against natural life because disease is comparable to “a living organism, which must be allowed to develop according to its own norms and forms, its specific rhythms and articulations. In disturbing the normal and natural progress of illness, the *pharmakon* is thus the enemy of the living in general, whether healthy or sick” (*Dissemination* 100).

As an enemy of the living, the capacity for the *pharmakon* to both

promote health and endanger life also brings the individual and community into precarious relationship, even though the one depends on the other for its existence. For example, when prescribed to individuals for the benefit of the community, as is often the case with vaccination, the *pharmakon* simultaneously strengthens and severs the ties that bind community members together: it unites the interests of the individual and the community in the quest for protection against disease; but, by actively exposing individual bodies to risk, it also brings them into irreconcilable tension.

At Risk: The Severance of the Singular and the Social

At the heart of the controversy surrounding immunization is the fact that this medical procedure introduces an element of risk—however extreme or negligible— in order to avoid a greater, future, risk—however imminent or improbable.³³ As James Colgrove observes, “[l]ike any medical intervention, vaccination carries the small risk of sometimes severe adverse reactions. But unlike other procedures, vaccination is performed on healthy people” (2).³⁴ Unlike the risks associated with lifesaving surgery, for example, the risks of

³³ Centuries later, even among those who are convinced by the efficacy of immunization and take its mechanisms for granted, the idea remains philosophically perplexing. Bringing its paradoxical nature to the fore, Esposito describes vaccination as a practice that “infects the organism in preventative fashion, weakening its primogenital forces: it risks killing what it meant to keep alive” (*Bios* 92). Georges Canguilhem offers a similar, if more ethically laden, description of the logic of vaccines, reasoning that modern immunological techniques excite “a curative faction . . . by introducing a lesser evil [*mal*], a benevolent evil, which leads the organism to react more promptly than usual so as to outstrip the onset of more serious, imminent harm [*mal*]” (32).

³⁴ See also Fine and Clarkson: “This observation, coupled with the fact that prophylactic vaccines are in general given to ‘healthy’ individuals, prior to exposure to disease, raises important ethical and strategic problems” (1012).

vaccination are assumed not in order to treat a diseased condition but to prevent one from happening. It is this preemptive—or, more precisely, prophylactic—aspect of risk assumption that generates so much resistance, especially when states impose the medical procedure on citizens. Previous to the development of state-sponsored immunization, regulations such as mandatory quarantine, which limited individual liberty in the effort to protect the common good, usually required people to *refrain from* an action or behavior such as travel or communal living. In contrast, mandatory vaccination policies forced people to *submit to* a medical procedure, “one that involved discomfort and whose safety and efficacy remained uncertain in the minds of many” (Colgrove 10). According to Nadja Durbach, compulsory vaccination acts “were the only government initiatives to intervene in direct and invasive ways with apparently healthy bodies that posed no immediate risk to the social body” (Introduction, location 246, par. 17). Accordingly, the unprecedented emergence of organized resistance to vaccination can be understood historically as a reaction to these dual elements of risk and coercion (Colgrove 11). The first “anti-vaccination” group, for example, which arose in nineteenth-century England, portrayed the procedure as dangerous and ineffective³⁵ and asserted that making it mandatory was a tyrannical violation of individual liberty (Colgrove 10-11). Their arguments were part of a growing discourse

³⁵ In *On Immunity: An Inoculation*, Biss references an observation made by Cass Sunstein in “The Laws of Fear,” and by Paul Slovic in *The Perception of Risk*, that people tend to believe that risky things carry little benefit and that beneficial things carry little risk. Applying this observation to the case of vaccination, she speculates that if we believe that vaccines carry a high risk, we may also tend to believe that they are ineffective (178).

attempting to articulate the optimal relations between the individual and the community. More specifically, they often reflected the ideal of individual liberty that was beginning to be promoted in liberal societies as a new social value.³⁶

While early opponents of vaccination often emphasized personal freedom and the integrity of the human body in their criticism of the state's intervention, as a strategy for preventing contagious disease, vaccination was always also part of a larger debate regarding the health of the social body (Durbach Ch. 6, location 2734, par. 1). Many in favor of mandatory legislation argued that as a matter of public health, the decision to vaccinate should not be left to individual conscience but rather made in line with the interests of the community (Durbach Ch. 7, location 3327, par. 27). It is this appeal to the communal good that pushes vaccination beyond the field of bioethics, where respect for patient autonomy is paramount and coercion is anathema, into the still-developing field of public health ethics, where it is less clear whether or when compulsory measures are appropriate (Colgrove 6).³⁷ Insofar as vaccination penetrates the individual and social body alike, the balance between the interests of the individual and the claims of the collective—one of the most fundamental and enduring tensions in the enterprise of public health—is nowhere more salient than in policies and practices surrounding immunization (Colgrove 2). As Baldwin observes, these dilemmas

³⁶ To read about the complex relationship between anti-vaccination movement and liberalism, see Durbach.

³⁷ For a general discussion on the key differences between medical ethics, which generally applies to individual interactions between physicians and patients, and public health ethics, which navigates the tension between individual and community interests, see Swain, Burns, Etkind.

counterpose the rights of the individual to autonomy and freedom and the claims of community to protection against the potential calamity threatened by its infectious members. They cast up the basic problem of reconciling individual and community in the most fundamental, pressing and unavoidable of terms (2).

The controversy surrounding immunization has, from its very inception, pitted the interests of the individual against those of the community. But in more recent years, the paradoxical relationship between the singular and the social organism implied in the decision to vaccinate has been brought to the fore even more vividly by deliberations concerning herd immunity. First formally described in the 1920s, (Colgrove 3; Fine 266) the theory of herd immunity accounts for the observation, made at least as far back as the mid-nineteenth century, that vaccinating only part of a population against smallpox could arrest an epidemic in full (Biss 23; Fine 266). As further evidence of this phenomenon, in the era before vaccination, epidemics tended to come in waves followed by lulls during which the number of new children who had not yet acquired immunity through natural infection approached a critical mass, rendering the community vulnerable to outbreak (Biss 23). Although it continues to carry a variety of meanings, the most common implication of the term 'herd immunity' is "that the risk of infection among susceptible individuals

in a population is reduced by the presence and proximity of immune individuals” (Fine, Eames, and Heymann 911). The idea is that when a sufficiently large segment of the population is immune to a specific, contagious disease, they provide indirect protection to those around them who would otherwise be susceptible to the infection.³⁸ Stated otherwise, when enough members of a community are immune, pathogens have difficulty moving from host to host and cease to spread (Biss 22). It is this consideration, made at the level of public health, that informs the policy of Mass Childhood Immunization (MCI) (Hobson-West 275) and is consistently referenced in legislative or persuasive attempts to overrule an individual's decision to refuse vaccination.³⁹ In order for public health goals to be met and maintained, we are consistently reminded, a high degree of compliance is necessary.

It is in light of the principle of herd immunity that an individual's decision regarding vaccination is thought to have a direct impact not only on her personal well-being, but also on that of her community. Insofar as the risks associated with vaccination are considered to be non-existent or negligible or at the very least outweighed by the benefits, this decision is used to provide a

³⁸ The indirect “herd effect” of vaccines applies only when infected persons participate in the transmission of an agent and when immunization induces at least some protection against infection (and not merely against disease). Thus, as John and Samuel reason, “immunisation against tetanus or rabies (even if given routinely) will have no herd effect. As BCG inoculation seems to protect only against progressive primary tuberculosis and not against secondary type pulmonary tuberculosis, it also has no herd effect” (604).

³⁹ An individual's “right” to make an exception of him- or herself by refusing vaccination is widely condemned as a threat to public health. From this perspective, the World Health Organization maintains that during a pandemic, it may be necessary to overrule existing legislation or (individual) human rights. Examples are the enforcement of quarantine (overruling individual freedom of movement), use of privately owned buildings as hospitals, off-license use of drugs, compulsory vaccination, or implementation of emergency shifts in essential services (“Checklist” 5).

strong counterexample to the assumption that “what is good for the body politic cannot be good for the body natural—that the interests of these bodies must be at odds” (Biss 131). As Biss summarizes in reference to “all sorts of risk-benefit analyses and models of herd immunity”: “vaccination benefits the individual as well as the public . . . even 'a population of self-interested people can defeat an epidemic’” (131).

However, when the risks (perceived or actual) of vaccination are just high enough to sway an individual's risk analysis when the threat of infection (perceived or actual) is relatively low, the principle of herd immunity introduces an irreconcilable chasm between the interests of the individual and those of the community. Assuming that an individual acts out of rational self-interest, he will act in a way that minimizes risk for himself or his children. If the perceived threat of disease is high, for example, and that of a vaccine is low, vaccination will be sought more readily than if the opposite is true. But insofar as vaccination offers indirect protection, when others assume the risks of vaccination, they are also thought to reduce the chances of infection for those around them and, indirectly, to increase others' willingness to forgo the procedure. On this basis, Fine and Clarkson argue that a rational, self-interested “individual's ideal strategy would be to encourage everyone else to be vaccinated, save himself or herself” (1013).⁴⁰ In other words, by offering an

⁴⁰ For a community, the optimal level of vaccine coverage is that level which minimizes the total morbidity in the population. But for an individual, the critical level of coverage is whatever minimizes his personal risk of disease—below which he should elect to be vaccinated, and above which he should elect not to be vaccinated (Fine and Clarkson 1014).

indirect benefit, vaccination is thought to generate a free-rider problem, that is, the possibility of individuals profiting from, without contributing to, the communal good. As with any free-rider problem, only so many can enjoy a free ride. Beyond a certain threshold, the social benefit is destroyed. In the case of vaccination, public health administrators insist that, while the decision of any one individual to refuse vaccination will not affect the group's protection, those decisions in the aggregate will undermine herd immunity. They accordingly urge all those deemed fit enough to undergo this medical procedure to do so, reserving exemptions for those with medical contraindications rather than those with conscientious objections.

In view of the potential for "free-riders" to take advantage of the immunity of those around them, Colgrove reasons that in contemporary liberal societies, where vaccination is voluntary, a successful vaccination program "depends at least in part on individuals making an altruistic decision" (4). But when the failure of altruism erodes the common good, considerations of herd immunity are often referenced as an ethical foundation for the acceptableness of coercive measures to ensure the welfare of the collective. That is, they are used to legitimize interventionist measures that liberal-oriented societies have historically resisted, namely mandatory vaccination. Previous to the emergence of "herd immunity," opponents of vaccination could more readily cite the dictum of John Stuart Mill that the only justification for coercive action against an individual is the presence of imminent harm to other members of

society or, in the words of Justice Oliver Wendell Holmes, that “the right to swing my fist ends where the other man's nose begins.” According to this libertarian principle, they would insist, the individual who refuses to accept the risks associated with vaccination places only himself at risk of natural infection, a situation that does not warrant state intervention. But insofar as the notion of herd immunity suggests a concrete other-regarding consequence to the decision against vaccination, recent liberal and libertarian philosophers have been keen to reference Mill's harm principle as the key ethical justification for compulsory vaccination (Colgrove 5).⁴¹ Since some vaccines fail to develop intended immunity in certain individuals (a phenomenon known as 'vaccine failure') and some are not recommended for people with certain biological susceptibilities, the argument goes, there are always some members of the community willing to assume the risks of vaccination but unable to benefit from its protective properties who are endangered by vaccine refusers (Colgrove 4).

In view of this enduring conflict, can we ever foster a healthy, vibrant community without overriding the individual interests of its members? Can we demand social responsibility in medical decision-making without reverting to coercive measures that are otherwise at odds with the ideals of a pluralistic, democratic society?

⁴¹ See, for example, Ronald Bailey: “To borrow Holme's metaphor, people who refuse vaccination are asserting that they have a right to 'swing' their microbes at other people. There is no principled libertarian case for their free-riding refusal to take responsibility for their own microbes.”

A Persistent and Paradigmatic Problem

When we extend consideration beyond the particularity of the problems involved in acquiring immunity, it is striking to consider how the same tensions between the individual and the community implied in the act of vaccination are at play in myriad other social interactions. According to Esposito, such paradoxes are paradigmatic of all encounters of life, individual and collective. “Whether we are talking about the outbreak of a new infectious disease, a dispute over established legal prerogatives, a sudden intensification of migratory flows, or . . . a terrorist attack,” he observes, “all of these events call on a protective response in the face of risk,” that is, an immune response (*Immunitas* 1-2).⁴² More specifically, in all of the above examples, he notes that the risk has to do with trespassing or violating borders: “Someone or something penetrates a body—individual or collective—and alters it, transforms it, corrupts it” (*Immunitas* 2). In the case of vaccination, several types of risks factor into the decision-making process: “the risk of contracting the disease a vaccine is designed to prevent; the risk of suffering an adverse event caused by the vaccination; and the risk an individual may impose on others by remaining without protection” (Colgrove 5). Yet all of these risks presuppose a body, either individual or collective, that is being compromised. A 'body,' after all, is not only a medical, but also a political entity. It can be used to denote individual organisms as well as social organizations. As Mary

⁴² In his interview with Timothy Campbell, he provides a general definition of immunity or immunization as “a particular situation that protects [mette in salvo] someone from a risk, a risk to which an entire community is exposed” (50)

Douglas writes, “[t]he body is a model which can stand for any bounded system. Its boundaries can represent any boundaries which are threatened or precarious” (141). Indeed, whether the danger that lies in wait is a disease threatening an individual body or a susceptible individual threatening the social body by undermining herd immunity, both incite a defensive immune reaction, at times biological, at other times political, most of the time impossible to distinguish. But when an individual's defense against a perceived threat in turn introduces a risk to the community, or vice versa, the singular and the social organism are forced to struggle against each other for their own survival, *even though both depend on each other for their very existence*.

In the effort to gain insight into the tension between the collective and the individual implied in the logic of immunization, and to better understand the underlying mechanisms operative in the various domains in which this relation is defined and redefined, Esposito turns to the etymology of 'immunity' to excavate its political-juridical meaning. He observes that in its ancient usage, immunity denotes an exemption on the part of the subject with regard to concrete obligations or responsibilities that under normal circumstances would bind one to others. In short, those who are immune owe nothing to anyone (*Immunitas* 5) and, as such, threaten to undermine the legitimacy of the social contract. And yet, indicative of the dual nature of immunity both to limit and protect, it is precisely by defining lawful exceptions to the law that the law

preserves its capacity to be applied universally and without exception. In other words, “since the law declares that its exceptions always already derive from it, such exceptions do not trouble its jurisdiction” (Cohen Introduction, location 153, par. 8). On the contrary, the exception confirms the rule in cases not excepted. A conscription law, for example, which identifies those who can legitimately opt out of service, compels those who do not meet its requirements to fight. To reinforce negatively the law that some people *must fight the war*, it allows some people to avoid fighting it. The people exempt from the law become a negative example for those who are not exempt *precisely to uphold the law*.

In the case of vaccination, the legitimate exemption of certain individuals from a routine immunization strategy—namely those understood to have immature or deficient immune systems—is recognized by health administrators as necessary to that strategy’s effective administration. These exceptions negatively reinforce the rule: it makes it all the more important for able bodies to be vaccinated and suggests that anyone who exempts him- or herself for other, non-medical, reasons or for no reason at all undermines the whole enterprise. The fear is that when too many people object to the procedure on conscientious rather than medical grounds, the threshold that guarantees herd immunity will be surpassed and the efficacy of the intervention jeopardized. It is similar to the concern that if not enough soldiers are enlisted to fight, homeland security will be compromised. The central idea

is that if enough people personally seek to avoid risk by making an exception of themselves and relying on others to defend the community, then everyone will be at increased risk. In this way, the individualistic strategy to minimize risk ultimately backfires. A different articulation of the same underlying problem found in conscription laws, in the decision to vaccinate we find a vivid medical example of the paradoxical nature of political immunity: in the attempt to achieve herd immunity, the very mechanism that protects the individual and the social organism—the capacity for exceptions—simultaneously threatens to undermine this protection.⁴³

Derrida articulates the capacity for organisms to inadvertently act against their own best interests in his discussions on autoimmunity. By 'autoimmune' he means "that strange behavior where a living being, in quasi-*suicidal* fashion, 'itself' works to destroy its own protection, to immunize itself *against* its 'own' immunity ("Autoimmunity" 143). Biologically, autoimmunity denotes a kind of malfunction in which an organism produces antibodies or lymphocytes that work against naturally occurring substances in the body. Extending its meaning beyond this usage, Derrida recognizes the perverse effect of autoimmunity, more generally, in terms of the capacity for organisms – whether social or singular – to produce the very dangers they need to avoid in

⁴³ In view of its political and biological meanings, Biss notes the convergence of these definitions that occurs in the decision against vaccination: "Long before the term *immunity* was used in the context of disease, it was used in the context of law to describe an exemption from service or duty to the state. *Immunity* came to mean freedom from disease as well as freedom from service in the late nineteenth century, after states began requiring vaccination. In a peculiar collision of meanings, the exemption from immunity made possible by the conscience clause was a kind of immunity in itself. And allowing oneself to remain vulnerable to disease remains a legal privilege today" (126).

order to ensure their own survival. From this perspective, he takes it as a given that “repression in both its psychoanalytic sense and its political sense – whether it be through the police, the military, or the economy – ends up producing, reproducing, and regenerating the very thing it seeks to disarm” (“Autoimmunity” 150).

Elucidating this paradoxical quality of immunity as it is operative in democracy, Derrida begs the question of whether a democratic society that squashes voices of dissent against democracy undermines or reinforces itself: “Is the right to speak without taking sides *for* democracy, that is, without committing oneself to it, more or less democratic? Is democracy that which assures the right to think and thus to act without it or against it?” (*Rogues* 41). Indeed, in order to preserve itself, a functional democracy must always risk its own demise. That is, in a well-functioning democracy, democracy itself must always remain open for discussion; it must always remain possible to democratically elect a totalitarian fascist. Otherwise, by squashing anti-democratic sentiments, democracy inadvertently produces the very authoritarianism it seeks to avoid. From this perspective, Derrida claims that there is no immunity without autoimmunity – there is no attempt at self-preservation that does not put the self at risk.

Similarly, Esposito observes that, in both its political-juridical and biomedical applications, immunity preserves the organism, either individual or collective, to which it pertains, by subjecting it to a condition that

simultaneously negates or reduces its power to expand: just “as the medical practice of vaccinating the individual body, so too the immunization of the political body functions similarly, introducing within it a fragment of the same pathogen from which it wants to protect itself, by blocking and contradicting natural development” (*Bios* 46). Without this immune reaction, Esposito insists, both individual and common life would die away. In the words of Derrida, “suppressing the immunity that protects me from the other might be nothing short of life-threatening” (“Autoimmunity” 194). Providing insight into this biopolitical paradox, Esposito acknowledges that, as a defensive form of protection, there is always the possibility that the immune apparatus inadvertently turns on itself and its constitutive elements destructively, pitting the individual and the community against each other even though the one cannot survive without the other. As with the *pharmakon*, the dose, it seems, is what makes the poison.⁴⁴

In view of its nuanced role in both the protection and negation of life, Esposito introduces immunity as a productive paradigm for considering more generally the destructive capacity of biopolitical phenomena, that is, the tendency for political interventions into living processes to inadvertently disrupt the life they intend to preserve. Stated concisely, he turns to (auto)immunitary logic in the effort to understand why “a politics of life always risk[s] being reversed into a work of death” (*Bios* 8). As outlined above, this paradox has

⁴⁴ To read more about how Esposito compares and contrasts his understanding on the negativity of immunitary logic from Derrida's theory of autoimmunity, see his interview with Campbell, 52-4.

haunted the study of biopolitics since its very inception: Why do mechanisms of power that endeavor to protect life, such as vaccinations, sometimes endanger it? According to Esposito, there is no phenomenon of international importance that escapes the double tendency implicit in all biopolitics: “On the one hand, a growing superimposition between the domain of power or of law [*diritto*] and that of life; on the other, an equally close implication that seems to have been derived with regard to death” (*Bios* 7). In view of its incredible pervasiveness, he asserts that a philosophy capable of thinking its own moment, “cannot avoid engaging with the question of immunization” (“Interview” 53).

But, what, exactly, does the question of immunization tell us about our own moment? What does the historically-situated medical practice of vaccination, for example, reveal about the potentially problematic ways in which we have come to think about 'life' at both the individual and collective levels? Is the disconnect between individual interests and the common good implied in the decision to vaccinate simply a function of the potentially self-destructive way in which immunity preserves life? Or does the problem lie in the particular, historically-situated ways in which this prophylactic strategy approaches life, such that other historical approaches to communicable diseases might open up new, life-affirming, ways of engaging with living organisms in both their singularity and their sociality?

Immunization and the Modern Enclosure of the Self

Acknowledging that the biomedical definition of immunity—the refractoriness of an organism to the danger of contracting a contagious disease—is ancient, Esposito maintains that the modern approach to and understanding of conferring immunity is absolutely distinct from older prophylactic methods.⁴⁵ He identifies the transformation of the concept of immunity between the eighteenth and nineteenth centuries, inspired by Jenner's development of vaccines, the experiments of Pasteur and Koch, and the birth of medical bacteriology as a critical development in immunological thinking (*Immunitas* 7). In fact, before 1883, the pivotal year when Élie Metchnikoff (1845-1916) ushered in a modern concept of immunity by defining it as the host's capacity to defend itself, neither 'immunity' nor 'defense' referred to physiological functions (Cohen 175). When 'immunity' was used in the pre-modern medical context, it was not thought of as a response *against*, but rather as a freedom *from* something (Zumbusch 9). As such, it borrowed from its juridico-political inheritance (Cohen 176) and was used primarily in a way that closely resembles the original, ancient Roman meaning, which denotes the exemption of certain individuals from universally-binding laws (Cohen 13).

From a medical-historical perspective, the answer provided by the field of immunology is simply one of several possibilities for explaining why, given

⁴⁵ According to Esposito, “What distinguishes the Egyptian agrarian politics or the politics of hygiene and health in Rome from protective procedures and the development of life set in motion by modern biopower . . . [is] the intrinsic immunitarian connotations of the latter, which were absent in the ancient world” (*Bios* 53).

uniform exposure to sources of illness, morbidity varies (Baldwin 3) – a distinctly modern one. As Cohen observes, “modern presumptions about personhood and collectivity saturate both immunity and defense,” the two cornerstones of modern immunology. Each concept “offers a different strategy for accommodating the frictions and tensions (if not outright contradictions) between the singular and the multiple, the one and the many, that characterize modern political formations” (Introduction, location 115, par. 3). Cohen argues that the immunological idea that survival requires a constant struggle against the world, now a central tenet of biomedical dogma, is at odds with biological thinking about how organisms coexist in shared ecologies, which includes myriad non-defensive possibilities for interaction available to organisms, such as symbiotic, neutral, and indifferent relations. Accounting for this obvious discrepancy, he argues that the life science's investment in a defensive organism exposes its (mis)appropriation of modern philosophies of personhood. That is, our understanding of biological

immunity incarnates ideas about human being culled from modern politics, economics, law, philosophy, and science, which then belatedly achieve scientific status when immunity inoculates them into the living organism and thereby validates them as essentially 'natural'

(Introduction, location 217, par. 17).

And yet, however seemingly 'natural' and self-evident the modern notion of

immunity has become,⁴⁶ Cohen's genealogy of its history reminds us that it does not provide the only way of imagining illness and healing (236) and, by extension, the only way of constituting relations between the individual and the community, self and other.

Gesturing towards one such overlooked alternative, Kuzniar notes that studies examining the cultural implications of vaccination around 1800 – in particular the understanding of immunity as a kind of defensive hardening – do not mention homeopathy and understandably so: after all, “homeopathy offers a different model of human communication and understanding of individuality” (*Birth of Homeopathy*, Ch. 3, location 2782, par. 69). In other words, the romantic understanding of an organism’s receptivity to disease that informed Hahnemann’s development of homeopathy stands to provide an illuminating alternative to the modern rise of germ theory and immunology. It bears repeating: the range of preventative techniques that the modern immunitary apparatus supports—as well as the distinctly defensive way in which it configures the complex relationship between individuals and communities—is not exhaustive. Other historical approaches to preventing disease suggest other conditions of possibility for engaging with living organisms and for navigating the full breadth of their potential for interaction.

Esposito's search for an approach to life that does not import the

⁴⁶ Cohen remarks that the more he delves into the subject, the less he understands why “it seems obvious to us to use a complex legal and political concept to describe how we coexist as organisms. Taken at face value, immunity has little to recommend it as an organismic possibility; indeed, once called to our attention, it seems hard not to notice that the trope only works as catachresis” (Introduction, location 328, par. 28).

contradictions we have come to associate with the immunitary response prompts him to problematize the specific immunitary logic adopted by modernism. As he explains in an interview with Timothy Campbell, it is precisely this “exasperated immunitary conception of biopolitics that became a form of paroxysmic thanatopolitics, that is, a politics of death” (52). Esposito identifies modernity with the historical and cultural period in which the project of preserving life takes the center of political theory and praxis. With the increasing secularization of religious meaning, he explains, modern subjects became increasingly exposed to the outside world and, in response to this new vulnerability and increased sense of risk, developed a series of immunitary apparatuses intended to safeguard life.

According to Giddens, its ongoing relationship with risk has become a fundamental feature of modern society. Reinforcing Esposito's reading of modernity, he argues that risk “is the dynamic of a society bent on change, that wants to determine its own future rather than leaving it to religion, tradition or the vagaries of nature” (“Taking Risk” 31). Where traditional cultures may well have been more hazardous than contemporary modern society, he explains, they had no concept of risk because they did not need one. They simply relied on ideas of fate or the will of the gods, whereas modern societies tend to substitute such supernatural concepts with the idea of risk (*Runaway World* 22-3). Through myriad processes that ultimately resulted in the disenchantment of nature, the unfathomable aspects of the natural world –

previously revered as an incomprehensible animating force – were replaced with calculable risks. In a modern society, for example, whether or not an individual fell ill to a contagious disease, was more likely to be explained in terms of quantifiable risk factors than in view of whether or not he was being punished for his sins or being struck down by the wrath of nature. In this way, the rise of variolation, and later vaccination, coincides with the secular and rationalistic ideals of the Enlightenment. Indeed, the general acceptance of acquired immunity signaled a decisive break away from fatalism: it represented modern man's eagerness to positively embrace risk by making the calculated decision to undergo the potential side-effects of a prophylactic medical procedure in order to protect himself from the scourges of a communicable disease.

As this example illustrates, another distinctive feature of the modern effort to defend life in the face of countless risks, is that it always requires a sacrifice. The religious sacrifice was simply replaced by a calculated one. From this perspective, Esposito identifies Thomas Hobbes as “the symbolic point of departure for the process of modern immunization” (“Interview” 54). Providing a paradigmatic example of the negative dialectic of immunization, Hobbes asserts that subjects must sacrifice all of their natural rights to the sovereign in order to protect their lives from the risk of death that is implicit in the community. As Cohen emphasizes, Hobbes characterizes the “state of nature” as one of “Warre of every one against every one” (qtd. in Introduction,

location 434, par. 37). Esposito finds this simultaneously defensive and self-sacrificing approach to individual and collective life in all of the political categories employed by Hobbes and his followers, including sovereignty, property, and liberty. He attributes the contemporary inability to protect life without inadvertently negating it to modernity's all-pervasive legacy.

After all, the modern quest to preserve life by minimizing the risks that threaten it, ultimately backfires. As Giddens observes, the attempt to mitigate existing risks simply gives rise to new, “manufactured risks,” that is, risks “created by the very impact of our developing knowledge upon the world” (*Runaway World* 26).⁴⁷ Furthermore, insofar as such manufactured risks have no historical precedent, the potential danger that they pose is impossible to calculate. Ironically, while the rise of the idea of risk was closely tied to the possibility of calculation, the risks that were inadvertently produced in the attempt to preserve life exceed our predictive capacities: “We simply don't know what the level of risk is, and in many cases we won't know for sure until it is too late” (*Runaway World* 28).

In view of the inherently negative way in which modernity attempts to preserve life, Esposito's search for an affirmative biopolitics is grounded first and foremost in the effort to “break the modern relation between biopolitics and immunization” (52), which, he argues, centers on the idea of a body that is closed on itself destructively.⁴⁸ Cohen argues that when medical science

⁴⁷ Giddens accordingly distinguishes between 'external risk,' that is “risk experienced as coming from the outside, from the fixities of nature,” and 'manufactured risk' (*Runaway World* 26).

⁴⁸ This is, for example, “how the Nazi biocracy conceived of the German people” (Esposito,

transformed the concept of immunity in the late nineteenth century by equating it with its defensive capacities, it radically changed how we imagine our bodies and how we understand what it means to live as an organism among other organisms (Introduction, location 115, par. 6). And when immunity as a mechanism of defense was employed in the 1880s to account for the success of Pasteur's vaccination experiments, it retroactively conferred the status of natural law on germ theory, solidifying the twin pillars of modern medicine: immunity and germ theory (18). According to Cohen: "Until immunity legalizes the microbe as the causal agent of disease from which immunity exempts an organism (thus negatively anointing it as the hostile entity against which an organism must defend itself), germ theory contended with a number of competing theories of disease causality" (18). The profundity of this development in both the history of medicine and modern political thought cannot be overstated. For although the modern notion of biological immunity appears somewhat late in a political context that had long since propagated defensive modes of embodiment, this particular incarnation of it "naturalizes such defensive presumptions by repurposing these juridico-political concepts as intrinsic to the human organism" (36).⁴⁹ The result was not only that the defensive activity previously reserved for the political realm was now also fully

"Interview," 52), and it was often with reference to the organic integrity of the German folk that the extermination of Jews was not only justified but deemed necessary. "Nazism treated the German people as an organic body that needed a radical cure, which consisted in the violent removal of a part that was already considered spiritually dead" (Esposito, *Bios*, 10).

⁴⁹ As Cohen astutely points out, it is anything but coincidental "that at the same moment when bioscientists affirm the metaphor of immunity's credibility as a biological truth, Nietzsche depicts all such truth as the forgetting of metaphor" (6).

operative on the biological plane. More critically, by achieving the status of a biological fact, such defensive activity, *in all of its various instantiations*, could now be valorized as a fact of life.

Instead of evoking the organism's essential connection to the world in which it lives, Cohen tells us, this quintessentially modern conception of immunity refigures medicine “as a powerful weapon in the body's necessary struggle to defend itself from its life-threatening context” (Introduction, location 169, par. 10). As Melinda Cooper observes, since the late 19th century, “modern biology imagined humans and microbes to be engaged in a merciless war; a struggle for survival from which only one of us would emerge victorious” (114). By defining the organism as a defensible interior which endlessly needs to protect itself from a hostile exterior, the modern concept of “immunity-as-defense” effectively naturalized the precepts of an earlier political modernization, one that appoints the individual body as the natural social unit (Cohen Introduction, location 341, par. 29). In Cohen's words: “Until the end of the nineteenth century the modern individual's atomized body did not accord with prevailing scientific theories that apprehend living organisms as contiguous with, rather than fundamentally distinct from, their lifeworlds” (Introduction, location 207, par. 16). Stated otherwise, with the rise of biological immunity, “a monadic modern body fully achieved its scientific apotheosis” (Introduction, location 207, par. 16): the insular body that Esposito identifies as the locus of biopolitical violence—a violence he seeks to

interrogate.

But how, exactly, should we respond to the closure of the modern body—both individual and collective—so that it can better escape power's grasp? Can we refigure the relationship between the singular and the social organism such that they no longer enter into defensive and ultimately self-defeating conflict with one another?⁵⁰ Can we preserve the protective features of the immune apparatus without inciting an autoimmune response?

Opening the Organism to Continuous Exchange

As described above, in the effort to preserve life without endangering it, many contemporary responses to the paradoxes at the heart of biopolitics reinforce the efforts of the early German Romantics to expose the organism to the outside world and thereby to soften the distinction between self and other. Applying this strategy to the concept of immunity, we might ask: If the autoimmune response signals a confusion between self and non-self, what happens if we altogether do away with this false dichotomy? The challenge, as the German Romantics were well aware, is to preserve the otherness of the other, that is, to not simply incorporate what is other into the self, but to positively embrace rather than ostracize what is alien to us.⁵¹ For his part, Esposito finds inspiration in Maurice Merleau-Ponty's deconstruction of the

⁵⁰ Indicative of how pertinent this issue has become in contemporary discussions of biopolitics, Giorgio Agamben considers it more urgent to work on these divisions “than it is to take positions on the great issues, on so-called human rights and values” (*Open* 29).

⁵¹ For more on this important nuance, see Stone, “Alienation from Nature and Early German Romanticism.”

compacted notion of the body and subsequent turn to the notion of flesh, which effectively opens the body both to its outside and its internal difference. That is, he turns to an understanding of immunity that takes as its starting point a conception of individual identity that distinguishes itself from the closed, monolithic one described in modern concepts of immunity: “Rather than an immutable and definitive given, the body is understood as a functioning construct that is open to continuous exchange with its surrounding environment” (*Immunitas* 17). Esposito insists that “a positive conception of biopolitics can only emerge . . . if one simultaneously develops a conception of life that is aporetically exposed to others in such a way that the individual escapes an immunization of the self (and hence is no longer an individual proper)” (Campbell, “Introduction,” xxix). He finds in the example of the implant, whether an artificial prosthesis or a natural implant like fertilized eggs in the mother’s womb, the most striking case in point:

The fact that the genetic heterogeneity of the fetus rather than its genetic similarity is what encourages the mother’s immune system to accept it means that the immune system cannot be reduced to the simple function of rejecting all things foreign. If anything, the immune system must be interpreted as an internal resonance chamber, like the diaphragm through which difference, as such, engages and traverses us (Esposito, *Immunitas*, 18).

From this perspective, Esposito notes, the capacity for the immune system to

turn in on itself and its constituent parts is displaced precisely because it resists an insulation of the self. Stated otherwise, in the case of pregnancy, immunity is no longer the enemy of the common. In fact, it never effectively closes itself off from the common. Furthermore, he notes that the productive immunitary features of pregnancy offer a suggestive metaphor for an immunity in which “the diversity of the other does not lead to an all-out immunitary struggle against it. The traditional immunitary paradigm that reinforces this reality is only one possibility” (Campbell, “Introduction,” xxxii). In view of the ongoing interplay between the biomedical understanding of immunity and its legal and political counterparts, Esposito maintains that the full significance of this more expansive understanding of the immune system still eludes us. The task of translating a non-negating, hospitable notion of immunity operative in the biomedical example of the transplant into political or ethical terms is, after all, not an easy one. It is not even clear that such a translation is possible. But, Esposito insists that it is “precisely on such a possibility that we have to gamble” (“Interview” 54).

Insofar as they subvert modern understandings of self and otherness, singularity and collectivity, I think that the alternative understandings of immunity that Esposito and other contemporary thinkers elucidate help establish the basis for an affirmative biopolitics. But the question remains: how do more fluid and porous conceptions of immunity address the problematic relations between the individual and the community implied in modern acts of

immunization? In other words, how does an organism in constant exchange with its environment live in relation with others? And so, in the attempt to more concretely understand how the biopolitical perplexities at the heart of the immunitary apparatus inform the relations between social and singular organisms, I turn to a prophylactic method that Hahnemann developed in view of his understanding that the preservation of life requires a dynamic interchange between an organism and its environment. As Kuzniar summarizes:

Hahnemann sees the human body as an open system in a continuous change of energies. The body responds to the vitality of the natural remedy rather than build, as one might explain today, antibodies against an entity. Whereas immunological identity, as inherited from the late eighteenth century, sets life against life, Hahnemann engages life on behalf of life. In this he resembles newer concepts of immunity that speak of auto-reactivity in terms of interaction and homeostasis as constant regulation of the body's balance (*Birth of Homeopathy*, Ch. 3, location 2804, par. 68).

Informed by the integrative ontology and epistemology of German Romanticism, Hahnemann's understanding of disease and its prevention is uniquely well-poised to expose the limitations of modernity's risk-laden and divisive understanding of immunity.

Although certain aspects of the counter-Enlightenment have been dismissed as a regression from modern scientific achievements, one of the distinguishing features of early German Romanticism is its endorsement of the enlightened values of secularism, humanism, and the primacy of reason. Stated succinctly, the Romantics “sought to create a culture that would reconceive nature as enchanted, but in a distinctly modern way” (Stone, “Schlegel” 4). Alison Stone accordingly finds this area of study relevant for any contemporary philosophy that attempts to reconceive nature as animated without completely jettisoning the values of modernity that we continue to uphold, values such as those prompting us to prevent disease rather than succumb to it fatalistically. Indeed, what is most illuminating about Hahnemann's response to epidemics is that it corresponded with the enlightened dream to rid the world of the scourges of disease. He was simply not prepared to engage in an endless negotiation of risk or, more precisely, to actively impose risk on living organisms, in order to accomplish this goal. His integrative ontology prevented him from drawing the lines of distinction necessary to justify the imposed burden on a single individual in order to benefit the whole. As a result, his distinctly romantic approach to disease prevention provides an important historical alternative to the modern trajectory of immunization.

If the self-defeating aspects of immunology and, more generally, biopolitics can be traced back to modern man's defensive reaction to his

threatening environment, what new possibilities become available to us when we consider alternative responses to this perceived risk? While modern immunology functions to naturalize our modern orientation to risk, I maintain that alternative immunological understandings of embodiment cannot alter our relation to others and our environment unless we also reconfigure our relation to risks, such as, for example, those involved in disease prevention. How do the risk assessments that inform our decisions regarding vaccination delineate a kind of life deserving of protection? How do they antagonize the relationship between the individual and the community? Finally, how might a problematization of this relation to risk help resolve the paradoxes at the heart of vaccination and, more generally, biopolitics? In short, in order to better understand how a less defensive understanding of immunity might bring the individual and community into more harmonious relations, I reformulate the quest for an affirmative biopolitics in terms of the politics of disease prevention: Is it possible to protect a multiplicity of individuals from communicable diseases without endangering the very lives we seek to protect? If so, how would such a non-negating form of protection resolve the seemingly irreconcilable tension between the individual and the community operative in the modern immunitary apparatus?

Chapter Two: Politics of the Body and the Body Politic

Before considering the ways in which the homeopathic prevention of epidemics suggests an alternative approach to life than that operative in the proliferation of risk analyses used to promote inoculation, it is important to first consider the general historical and political conditions under which both methods were developed. As public health initiatives that developed alongside the rise of the modern state, both inoculation and homeopathy were of interest to state leaders urgently trying to improve the health of the population. Yet, as we will see, state initiatives to interrupt the spread of infectious disease and to thereby increase the life expectancy of the population – however enlightened – were never exclusively motivated by humanitarian ideals. Economic and militaristic interests were also at play in efforts to foster the vitality of the population. And, as Foucault presents it, this instrumentalist investment in life introduced a problematic gap between the 'population,' a life force that is valued for its contribution to the wealth of the modern state, and the 'multiplicity of individuals' – the aggregate of living bodies – which is thereby stripped of its inherent value.

In view of the problematic divide between the population and the multiplicity of individuals that it generates, one of the biggest challenges emerging from Foucault's account of biopower is how to distinguish life-giving public health initiatives from the biopolitical apparatus that generated them. While many have been eager to salvage social medicine from the grips of the

medical police by emphasizing the individual rights and freedoms won by the rise of liberalism and its critique of state power, the insidious nature of biopower prompts us to more carefully examine how various medical interventions continue to reinforce its originary divisiveness despite radical transformations in political ideology.

Raison d'État: The State's Raison d'Être

As Foucault's historico-political analyses detail, Western mechanisms of power have undergone a profound transformation since the classical age: the tactics of battle have retained the same underlying principle—"that one has to be capable of killing in order to go on living" (*History* 136-37)—but mechanisms of power invariably change shape when employed to secure states rather than to protect the sovereignty of monarchs. For modern society, he observes, "the existence in question is no longer the juridical existence of sovereignty; at stake is the biological existence of a population" (*History* 137). That is, power is no longer exercised to ensure the safety of the prince and his territory, but rather the security of the population and, by extension, of those who govern it (*Security* 93).

Foucault situates the historical rise of biopower in the aftermath of the Thirty Years' War (1618-48), an enduring period of political and religious conflict that destroyed countless lives and devastated economic growth throughout many parts of Europe (Cohen Introduction, location 368, par. 32).

When the ambassadors who negotiated the treaty of Westphalia sought to end the persistent wars by establishing a state of balance between European states, he argues, the nation state developed a new interest in the life of its population, recognizing it as the most valuable resource for maintaining a state of war preparedness (Foucault, *Security*, 384). After all, the new equilibrium in Europe did not actually end the state of war, but rather changed its terms. According to Gustav Schmoller, during this formative period, the whole history of European foreign relations can be “summed up in the opposition to one another of the separate interests of the newly rising states, each of which sought to obtain and retain its place in the circle of European nations” (50).

In the interest of its own survival, each state strove to rely as much as possible on domestic resources to support its military, political, and economic initiatives, which were numerous. It was necessary not only to repair the ravages of war, but also to meet the new military demand to establish permanent armies, all the while addressing the population's growing consumption. Together, these circumstances led states to develop strategies both to promote and protect their productive potential. The result was a set of mercantilist policies and interventions designed to accumulate financial resources and achieve self-sufficiency through state subsidy, control, and protection (Cohen 59; Raeff 1224). In its various forms (including the distinctly

German form, *cameralism*),⁵² mercantilism can most coherently be understood as “the instinctive national policy of states in the process of evolution, while at the same time in miscellaneous struggle with other states” (Small 25). More specifically, in the attempt to maintain always an advantageous position in the balance of trade, the importation of manufactured goods was discouraged in favour of their production and exportation; the exportation of raw materials was prohibited; and domestic shipping and coasting trade were encouraged by restricting or forbidding foreign competition (Schmoller 58). Although a country’s unique geopolitical position informed the specific ways it adopted these general guidelines, the consistent thought pursued everywhere was this: “as competition with other countries fluctuated up and down, to cast the weight of the power of the state into the scales of the balance in the way demanded in each case by national interests” (Schmoller 59). In short, *raison d’État* was each state’s *raison d’être*.

The perilous balance established in Europe was meant primarily to prevent any state from becoming strong enough to enforce its law on any other state. But, as Foucault notes, “war is the first instrument of this precarious, fragile, and provisional universal peace” (*Security* 387). More specifically, after “peace” was established in Westphalia, it was deemed not only justified, but also necessary, to wage war in order to preserve this

⁵² *Cameralism* is often referred to as the more politically-oriented, specifically German, form of, or continental translation of, mercantilism (Cohen 266; Rosen, “Cameralism,” 23). For a description of the important differences between *cameralism* and mercantilism and the distinct geopolitical circumstances that gave rise to each form of statecraft, see Wagner.

balance (*Security* 387). The existence of a large, expensive, permanent military apparatus within this system of “peace” was one of the indispensable instruments for the constitution of European balance (*Security* 392; Cohen 65). And so, while the treaties that ended the Thirty Years’ War allowed state leaders to empty the battlefields and rebuild the economy, they also prompted them to make massive investments in permanent armies to carry out military operations. The continuity of life that could be trained for such purposes—the endurance of the life of the population—became an object of unprecedented political and economic importance. As George Rosen observes: “[a]dmiration for the virtues of a growing population and intense desire to increase the number of people within a country mark the political and economic views of the later seventeenth century and of most of the eighteenth century” (“Cameralism” 21).

Since the preservation of the state requires not only a living population but also a thriving one, it follows that the role of modern government is not just to govern, but also to improve the condition of the population, to increase its wealth, its longevity, and its health (Foucault, *Security*, 141). In a mercantilist system, the prosperity and happiness of the population was considered the wealth of the state, a basic principle expressed nowhere better than by the young Prince Friedrich of Prussia: The might of a state, he recognized,

does not at all consist in the extent of its lands, nor in the possession of vast wastes or immense deserts, but in

the wealth of its inhabitants and in their number. The interest of a prince is thus to populate a country, to make it flourish, not to devastate and destroy it (qtd. in Broman 46).

This view, held by many throughout Europe, functioned to legitimize the state's interest in organizing and intervening in societal affairs. With the rise of the modern state, the traditional role of government shifted from the duty to preserve justice to the active task of fostering society's productive energy. Foucault identifies this transition with the rise of a police force that could effectively enforce and regulate matters of national interest through various methods of inspection and surveillance, information and intelligence gathering, and direct intervention (sometimes to the point of deadly force) in private, familial, and commercial matters (*Security* 465).⁵³ Installed to make *raison d'État* function by intervening in the lives of citizens (*Security* 358), the police force continued to demonstrate the exertion of power in ever new domains of life (*Security* 440). In concrete terms, managing the population required, among other things, reducing infant mortality rates, preventing epidemics, and lowering morbidity and mortality rates of endemic diseases (*Security* 474). In crude terms, it required fostering the life body that populated the permanent armies that had been erected to defend newly delineated nation states (Cohen Introduction, location 434, par. 36). And it is in this context that Foucault traces

⁵³ Reinforcing this transition, Foucault emphasizes: "Police is not justice. Whether written by those who support and justify the need for a police, or by jurists or parliamentarians who display a certain mistrust of police, all the texts agree on this: police is seen as not being justice" (*Security* 439-40).

from “beneath the dramatic and somber absolute power that was the power of the sovereign, and which consisted in the power to take life,” the emergence of biopower: “the power to make live” (*Society* 247).

Medical Policing and its Valuation of Life

Insofar as the preservation of the state was correlated generally with the prosperity of its members, the domain of the police in modern states was immense, extending, as Foucault succinctly summarizes in *Security, Territory, Population*, from “living to more than just living” (421), its heterogeneity a testament to its totalizing aspirations. In its modern usage, 'police' refers to “the set of interventions and means that ensure that living, better than just living, [and] coexisting will be effectively useful in the constitution and development of the state's forces” (421). Stated otherwise, “the objective of police is everything from being to well-being, everything that may produce this well-being beyond being, and in such a way that the well-being of individuals is the state's strength” (422). Despite differences in the various ways it was worked out in practice, the basic idea behind the emergence of the police apparatus—that is, the imperative to use and increase the state's forces in a way that reinforces rather than compromises the order of the state (414)—showed remarkable resilience over time and across Europe (Carroll 464).

As one of the regions most devastated by the enduring years of religious and political war, in the years following the treaties of Westminster, German

states engaged in some of the most intense theoretical and practical development of “state-making” and police control in Europe. Following the Thirty Years’ War, while other state systems were expanding to meet the new needs of the time, the German territories had to struggle for their very existence (Small 48). It was not only the immense loss in men and capital compared with other regions that pushed German states into retrogression, but also, more critically, its lack of politico-economic organization and consolidation of its forces (Small 48). It was, in short, not without reason that German statesmen came to attribute their struggles to want of a good “*Polizei*” (Small 45). Foucault appropriately refers to the German states that were constituted and reorganized at the time of the treaty of Westphalia as privileged spaces for innovation of policing strategies. Occupying an intermediate position between feudal structures and the big European states, he observes, they became small, microstate laboratories that could serve both as models and sites of experiment (*Security* 412-13).⁵⁴

During these formative years, German territories became paradigmatic examples of a modern police state trying to cultivate internal resources in order to achieve external security. In the attempt of these small, war-torn territories to secure their place in the newly established European equilibrium, a new form of statecraft was developed, called *cameralism* (Cohen 60). While *cameralism* is often presented as the continental version of mercantilism, the

⁵⁴ As Neocleous observes, it was in large part the collapse of the feudal world that demanded new practices of order and new concepts with which to understand those practices and, in turn, that linked police to the doctrine of *raison d'État* and the emergence of the modern state (436).

critical difference is that the latter emphasized the prosperity of the state through economic regulation while the former sought to govern people's lives (Cohen 266). More specifically, the project of *cameralism* encompassed the inhabitants of the state, not in their singularity, but “as an aggregate whose collective life activities it channels, directs, augments, enhances, organizes, and dedicates to the 'happiness' of the state” (Cohen 61). It used methods which were clearly out of the question for democratic societies: its most salient feature was the *subordination of the interests of the individual to the interests of the community*” (Small 29), or, more accurately, to the interests of the state. In the effort to consolidate and centralize administrative and economic policies for the absolute monarch, the primary task of cameralists was to provide the heads of state with the aggregate knowledge necessary for state action (Rosen, “Cameralism,” 24). To this end, they made extensive use of a strong police force; *Polizeiwissenschaft* was taught in German universities as a subfield of *Kameralwissenschaft*, with practically no equivalent until the end of the eighteenth century, when it would exert a critical influence throughout Europe (Foucault, *Security* 412-13).

Alongside the development of administrative systems to centralize all activities in the German territories for the welfare of the state, medical men developed an increasing interest in the relation of health problems to the state (Rosen, “Cameralism,” 35). In the eighteenth century, German academic physicians struggled for recognition in a society bombarded with a plethora of

“health providers,” including surgeons, barbers, and midwives, as well as miracle healers, charlatans, and drug peddlers. Their predominantly academic training and proficiency in Latin was unimpressive to the large majority of the population and, without a recognized standing in society, most physicians had only a few patients on whose fees their income depended. Indeed, many medical practitioners complained that their wealthy patients viewed them as a kind of servant (Broman 19-20; Huerkamp 621). In an effort to gain a more authoritative and financially secure position in the health field, in the 1770s, numerous physicians began publishing works in the area of public health, with the hope of gaining recognition from state administrators. More specifically, they started to present medical policy in terms of the new cameralist discourse and proved themselves quite adept at so doing (Broman 49-51). Their efforts to establish themselves as important contributors to the administration of governance were largely successful, and over time, questions of health and disease were deemed so critical as to warrant a new domain of political interest, namely 'medical police.' While the population's well-being already fell generally under the scope of modern police, the explicit emphasis on medicine as a form of governance effectively refocused the policing project.

The rise of medical policing effectively functioned to align the police force with medical experts rather than the cameralist administrators who had previously dominated the scene (Cohen 66). Medical policing came to be recognized as a particularly important branch of general policing, since its

reach was not confined to those who came under its influence through specific circumstances, but applied to the whole population (Rosen, "Fate," 56). Indeed, this new jurisdiction expanded the purview of medicine from the individual body to the body politic and, with it, its governing concerns to include social, political, and economic factors that inform the population's vitality (Cohen 67). In this capacity, although medical policing did not normally deploy deadly force, it was otherwise configured within the general ideas and practices of policing and included methods of investigation, regulation, prosecution, information gathering and intervention (Carroll 465). Like other jurisdictions of state power, the medical police authorized itself by declaring its interest as the state's interest. Although it continued, as medical practice, to exhibit a deep interest in life, as an extension of the police force, this investment did "not accrue interest simply because human life—or more specifically, the life that citizens embody—represents an intrinsic good" (Cohen 73). Rather, medical police valued the life of the population "as a fund on which the state can draw" (Cohen 73). In other words, medical police based their recommendations on one of the central principles of eighteenth-century *cameralism*, namely that the size and productivity of a state's population is the cornerstone of its economic and political power (Broman 51). As Cohen perceptively observes, this advantage-value calculus is what frames the entire discourse of medical police or, more specifically, the way in which it "explicitly defines human 'value' as not only calculable per se but

calculable precisely with respect to the 'advantage of [the] population'" (69).

Providing a coherent framework for optimizing the state's primary asset, that is, the vitality of its population, the medical police had a lasting impact not only on European political and medical thought, but also on public health practice. The six-volume *System of Complete Medical Police (System einer vollständigen medicinische Policey)*, for example, written by Johann Peter Frank (1745-1821), had a direct influence on medical pedagogy and encouraged others to translate the principles of medical policing into official legislation (Cohen 67). While the effect of his work was felt most strongly within German-speaking regions, and in areas such as Italy, which were in close political and cultural contact with the German states, there is little doubt that Frank helped spread his notion of medical police beyond German borders: by the later eighteenth century and well into the nineteenth century, his ideas appeared not only in Germany, Austria, and Italy, but also in France, Great Britain, and the United States (Rosen, "Fate," 46).

The Rise of the Population and the Fall of Men

Though it undoubtedly improved the health and longevity of countless lives, the fact that the modern state's investment in public health was originally for the explicit purpose of building a robust military and a strong economy gives us reason to question the ways in which its various strategies configure the multiplicity of individuals in relation to the population. As Foucault warns,

although the well-being of the population appears, at first glance, to be the final end of government, when *raison d'État* is the predominant political rationality, the well-being of a population is valuable only insofar as it preserves the state. In other words, there is “*an absolutely fundamental caesura*” between the population, a level that is pertinent for the government's economic-political action, and the multiplicity of individuals that is no longer pertinent, or more precisely, “pertinent to the extent that, properly managed, maintained, and encouraged, it will make possible what one wants to achieve at the level that is pertinent” (*Security* 64). More specifically, through the use of forecasts, statistical estimates, and overall measures, biopower engages with the population as the primary life body and relates to the multiplicity of individuals that comprise the population as merely that. With the most sophisticated of techniques, he observes, it achieves a kind of “bestialization of man” (qtd. in Agamben, *Homo Sacer*, 10). In the words of Foucault: “[F]or the first time in history, the possibilities of the social sciences are made known, and at once it becomes possible both to protect life and to authorize a holocaust” (qtd. in Agamben, *Homo Sacer*, 10).

Although he distinguishes biopower from sovereign power in its capacity to normalize, modify, and regulate rather than annihilate life, Foucault insists that biopower's rise to prominence did not thereby coincide with a decrease in bloodshed. Moreover, he provides insight into the apparent paradox that the power to make live could be capable of hitherto unthinkable violence. More

specifically, Foucault highlights the ways in which biopower takes on a new capacity for destruction when it operates at the level of the population: “If genocide is indeed the dream of modern powers, this is not because of a recent return of the ancient right to kill; it is because power is situated and exercised at the level of life, the species, the race, and the large-scale phenomena of population” (*History* 137).

In her account of the rise of the modern state, Arendt similarly problematizes the development of public health, which, she argues, targets the life-body of the population in such a way that dissolves the freedom and spontaneity of its individuals. In *The Human Condition*, Arendt identifies the state’s preoccupation with the “life process itself,” that is, with “all activities serving the subsistence of the individual and the survival of the species,” as a distinctly modern phenomenon (72). In contrast, she notes that in the ancient Greek polis, laborers who ministered to the bodily needs of life, and women who guaranteed the physical survival of the species, were always hidden away in the private sphere, well beyond the scope of public life (72). Matters of survival were, according to ancient Greek understanding, driven by necessity and thereby justified the use of violence. As such, they were categorically excluded from the polis, where “everything was decided through words and persuasion and not through force and violence” (26). The violence necessitated by the struggle for survival was characteristic of life beyond the polis. Such violence was the distinctly pre-political act of liberating oneself

from the necessity of life for the freedom of the world (31). But, Arendt observes, it was never a matter of politics proper. And for good reason.

According to Arendt, the movement of the life processes from the privacy of households to the light of public consciousness did not bring with it an end to the brutality characteristic of bare necessity. She insists that the violence previously characteristic of family life, “where the household head ruled with uncontested, despotic powers” (27), has since become “the monopoly of government” (31). She argues that the relations among citizens in modern society resemble the equality of household members before the despotic power of the household leader. The one critical difference is that in society, “where the natural strength of one common interest and one unanimous opinion is tremendously enforced by sheer number, actual rule exerted by one man, representing the common interest and the right opinion, could eventually be dispensed with” (40). Arendt refers to this modern phenomenon as “a kind of no-man rule” and insists that “this nobody, the assumed interest of a society as a whole . . . does not cease to rule for having lost its personality” (40). On the contrary, on every level of society this “rule by nobody” “expects from each of its members a certain kind of behavior, imposing innumerable and various rules, all of which tend to normalize its members, to make them behave, to exclude spontaneous action or outstanding achievement” (40). Stated otherwise, this “rule by nobody” erodes the mechanisms that protect singularity and shelter community from its own

excess. Arendt warns that under certain circumstances, “rule by nobody” may turn out to be one of the cruelest and most tyrannical versions of rulership and, for this reason, maintains that “statistical uniformity is by no means a harmless scientific ideal; it is the no longer secret political ideal of a society which, entirely submerged in the routine of everyday living, is at peace with the scientific outlook inherent in its very existence” (43).⁵⁵

In view of the particular violence that both Foucault and Arendt associate with the administration of life at the level of the population, it is instructive to consider the ways in which this expression of biopower differs from methods that target individual members of society. According to Foucault’s historico-political reading, biopower first emerged in the late seventeenth and early eighteenth centuries through practices that centered on

⁵⁵ In *Homo Sacer*, Agamben views the fact that Foucault could begin his study of biopolitics with no reference to Arendt’s work as a testament to the “difficulties and resistances that thinking had to encounter in this area” (10). He thinks that it is most likely these same difficulties “that account for the curious fact that Arendt establishes no connection between her research in *The Human Condition* and the penetrating analyses she had previously devoted to totalitarian power (in which a biopolitical perspective is altogether lacking), and that Foucault, in just as striking a fashion, never dwelt on the exemplary places of modern biopolitics: the concentration camp and the structure of the great totalitarian states of the twentieth century” (10). Without disputing Agamben on this point (and, more affirmatively, agreeing with its *raison d’être*), I find it important to highlight the passages—albeit few and far between—in which Foucault does explicitly address the Holocaust (see above) as well as the continuity between Arendt’s study of biopolitics and her observations of the Eichmann trial. While she deliberately confines her observations of *Eichmann in Jerusalem* to the trial of a single man and explicitly denies that her book could possibly provide an account of totalitarianism, Arendt does take care to explicate her observation that it is “the essence of totalitarian government, and perhaps the nature of every bureaucracy...to make functionaries and mere cogs in the administrative machinery out of men, and thus to dehumanize them” (135). While she then only acknowledges that “one can debate long and profitably on the rule of Nobody, which is what the political form known as bureau-crazy truly is” (135), without proceeding to do so, I think that this suggestion, alongside her penetrating account of Eichmann—his incredible normalcy, his absurd use of *clichés*—as well as her more general observations on the “banality of evil,” is apt. More specifically, it provides an instructive biopolitical context for considering her insights in *The Human Condition* alongside her work on totalitarianism in a way that appropriately refuses to deny the utter singularity of either the Holocaust or the Eichmann trial.

the human body (*Society* 241-42). This “anatomy-politics” is exercised by procedures of power that characterize the “disciplines” (*History* 139), that is, technologies that aim to forge a “docile [body] that may be subjected, used, transformed and improved” (*Discipline* 136). Foucault contrasts this form of biopower with one that emerges later, in the second half of the eighteenth century, as “a unique, non-disciplinary, technology of power, that applies to man-as-living being” (*Society* 242), namely biopolitics.⁵⁶ In contrast with the disciplines of anatomy-politics, biopolitical technologies correspond with “the species body” and address biological processes such as propagations, births, mortality, life expectancy, and longevity, along with all the conditions that can cause these to vary (*History* 139).

Although Foucault distinguishes anatomy-politics from biopolitics insofar as the former is exercised on the bodies of individuals, while the latter relates to populations, he is careful to qualify that the individual is *not* the primary datum on which disciplines are exercised. Rather, disciplines exist only insofar as there is a multiplicity and, more importantly, a goal or objective that can be obtained on the basis of this multiplicity (*Security* 26). He points out that the task of governing an entire population made the need to develop

⁵⁶ By focusing primarily on the normative management of populations, my study of biopolitics falls into the ‘stream’ identified by Hardt and Negri that focuses on the “administration of life that generally requires viewing individuals from a statistical perspective, classifying them into large normative sets, which become more coherent the more the microsystems that compose them are de-subjectivized and made homogeneous” (57-8). Recognizing that this interpretation has the merit of “philological fidelity,” they criticize it insofar as it “poses against this threatening, all-encompassing power over life no alternative power or effective resistance but only a vague sense of critique and moral indignation” (58). I contend that the merit of this approach extends far beyond “philological fidelity” insofar as it provides us with methods of recognizing the most lethal aspects of biopower and of seeking more life-giving alternatives.

disciplines—that is, methods of controlling human bodies—even more acute. As such, he insists that we refrain from understanding the analytics of power as the replacement of a society of sovereignty by a society of discipline, and then of a society of discipline by a society of government. “In fact we have a triangle: sovereignty, discipline, and governmental management, which has population as its main target and apparatuses of security as its essential mechanism” (*Security* 143). While the anatomo-political axis of biopower *segregates* a multiplicity of men into individual bodies that can be monitored, trained, employed, and, if need be, punished, the biopolitical axis *massifies* it into a population that can be influenced by overall processes characteristic of life (*Society* 242). In short, anatomo-politics disciplines the multiplicity of individuals into a population that biopolitical mechanisms can then monitor and control. Together, both axes of biopower work to produce a life that takes priority—the population—and by extension, a life that is subsumed to the population—the multiplicity of individuals. In this way, these two levels of the individual and the collective are mutually implicated in producing a life that is no longer inherently valuable but only instrumentally so.

Foucault explains that it was precisely this “taking charge of life, more than the threat of death, that gave power its access even to the body” (*History* 143). This in turn accounts for the apparent paradox of biopower’s capacity to both foster and endanger life. In short, power needs animate bodies in order to exercise its dominion over life. As Esposito observes:

The body is the most immediate terrain of the relations between politics and life, because only in the body does life seem protected from what threatens to harm it and from its own tendency to go beyond itself, to become other than itself. It is as if life, to preserve itself as such, must be compressed and kept within the confines of the body (*Immunitas* 14).

In the absence of living bodies, biopower would cease to exist. It is precisely for this reason that Foucault identifies death as “power’s limit, the moment that escapes it” (*History* 138). And yet, in view of the tactics of power—that one has to be capable of killing in order for a population to go on living—it is clear that the state’s project of fostering life does not thereby render it philanthropic. As Foucault reasons, as soon as power gave itself the function of administering life, “its reason for being and the logic of its exercise—and not the awakening of humanitarian feelings—made it more and more difficult to apply the death penalty” (*History* 138).

How, then, “could power exercise its highest prerogatives by putting people to death, when its main role was to ensure, sustain, and multiply life, to put this life in order?” (*History* 138). Simply stated, when this question is considered exclusively at the level of individual bodies, it cannot: “For such a power, execution was at the same time a limit, a scandal, and a contradiction” (*History* 138). Without a biopolitical apparatus with which to prioritize the life of the population, acts of murder undermine biopower’s grip on life. That is, the

state wastes a valuable resource when it cannot exploit a life. Nevertheless, the seeming contradiction of biopower's administration of death begins to dissolve when we shift our perspective to the level of the population. In order to maintain capital punishment, biopower need only invoke the criminal's incorrigibility and the need to safeguard society (*History* 138). In a biopolitical state, the interests of the population are paramount. And, according to this logic, when a dangerous criminal is considered beyond reform, then execution may well have its place. That said, if he is still responsive to "rehabilitation," then biopower undermines itself by annihilating a life rather than using the animate body to populate its army. After all, the "life" that is taken up by biopower "appears 'ordered' within 'the body' as a resource for, a condition of, war preparedness" (Cohen Introduction, location 445, par. 38). It is, I think, from a distinctly biopolitical perspective that we can best understand Foucault's observation that "those who died on the scaffold became fewer and fewer, in contrast to those who died in war. *But it was for the same reasons that the latter became more numerous and the former more and more rare*" (*History* 138, my emphasis). Indeed, when the *raison d'être* of biopower is to secure the life of the population and, by extension, of those who govern it, there is no longer a discrepancy between the power that administers life and the power that administers death to docile bodies. As Foucault notes, within the system of biopower, "killing or the imperative to kill is acceptable only if it results not in a victory over political adversaries, but in the elimination of the

biological threat to and the improvement of the species or race" (*Security* 256). Reinforcing this observation, Esposito observes: "Where the health of the political body as a whole is at stake, a life that doesn't conform to those interests must be available for termination" (*Bios* 133). He notes that, by preoccupying themselves with the health of the German body, medical and political men in the Nazi state "turned themselves into the executioners of those they considered either nonessential or harmful to improving public health" (*Bios* 115). From this point of view, Esposito prompts us to consider genocide as the result, not of an absence, but of a presence, of a medical ethics perverted into its opposite (*Bios* 115). He goes as far as to argue

that at least some Nazi doctors actually believed that they were respecting the substance, if not the form, of the Hippocratic oath that they had taken, namely, not to harm in any way the patient. It's only that they identified the patient as the German people as a whole, rather than as a single individual. Caring for that body was precisely what required the death of all of those whose existence threatened its health (*Bios* 115-16).

And so, insofar as it targets the collective body rather than the individual, biopower bestows upon itself the power to kill without undermining its power over life. In this way, it gains a grip even on death. As Foucault observes in *Society Must be Defended*, power can influence death only at the level of the

population, that is, only “in general, overall, or statistical terms” (248). Stated succinctly: “Power has no control over death, but it can control mortality” (248). While biopower can reinforce its anatomo-political axis only through the administration, rather than the annihilation, of life, along the biopolitical axis, biopower’s dominion over life knows no limit.⁵⁷ And yet, by explicating biopower’s lethal capacities, enabled by its abstraction of “life” from the population, we should not by extension consider its anatomo-political apparatus to be benign. It is, after all, only ever by disciplining docile bodies that biopower establishes contact with life, manipulates bodies, and populates a life force with which to execute its economic-political agendas. Without a multiplicity of individuals, there is no population. But without a population, biopower can sustain itself only by administering life, not annihilating it. And so, in view of the nuanced relationship between biopower’s control over living bodies and its stronghold on the population, how can we most strategically respond to its lethal articulations while retaining its life-saving potential? How can we extricate effective public health initiatives from the biopolitical machine that generated them?

⁵⁷ I find in this reading of the biopolitical paradox a possible rebuttal to Esposito's contention that Foucault fails to account for biopolitics' propensity for violence because he continually oscillates on the question of whether or not biopower's interest in protecting the vitality of a population represents a clean break from the sovereign right to kill (*Bios* 42). Foucault explicitly states that genocide is not a vestige of the ancient right to kill and offers another, distinctly biopolitical, explanation to account for such violence.

Is it Social Medicine or *Medizinische Polizei*?

In the effort to salvage life-saving public health initiatives from modern biopolitics' proclivity for violence, I explicitly distance my analysis from attempts to distinguish social medicine from medical policing by reducing the latter to an extension of eighteenth-century German leadership that attempted to govern life for the explicit purpose of strengthening state power. Rosen, who argues that the German approach to public health was wholly incompatible with the individual freedom that the British were already starting to take for granted at the end of the eighteenth century, was instrumental in popularizing this interpretation; he observes that insofar as the concept of medical police was adopted outside of Germany, it tended to be limited to areas of community life where governmental intervention was generally accepted, most notably disease prevention ("Fate" 47). I contend that this polarized reading of the history of public health fails to acknowledge the more insidious, though no less interventionist, forms of biopower operative in certain "liberal" forms of medical rationality, such as the analysis of risks used to promote immunization to the population. It also reduces the rich plurality of German medical innovations to its most totalitarian expression and overlooks important contributions, such as the homeopathic prevention of epidemics, that explicitly counter such calculating and divisive approaches to life.

Even on the question of communicable diseases, comparative readings of the history of public health tend to polarize, on the one hand, the tendency

of the German monarch to give more consideration to the needs of the community than to the claims of the individual and thereby legitimize mandatory quarantines and vaccinations; and on the other hand, Britain's consistent use of tactics, such as broad sanitary measures and voluntary vaccination, that would impinge less obviously and immediately on the rights of individuals (Baldwin 556). The British spirit of individual liberty, such readings suggest, was resistant to any restrictions on personal freedom: the working class would not tolerate drastic statutory intervention; trading interests resisted quarantine's interference in commercial liberty; and compulsory smallpox vaccination was regarded as a violation of personal liberty (Baldwin 28).

Following Rosen's lead, in his essay "Security and Vitality: Drains, Liberalism, and Power in the Nineteenth Century," Osborne goes as far as saying that Britain was "a country without a tradition of police, but with a strong tradition of liberalism" (105), invoking this "more or less straightforward historical fact" (105) to discredit readings of the history of medicine that emphasize the continuity between an absolutistic police science and later developments within the regulation of health. Presenting the eighteenth-century science of police as the prototype of a more or less totalizing form of biopolitics in which nothing was to be impervious to the gaze of knowledge, Osborne's quest for a non-totalizing biopolitics turns him to the distinctly liberal art of regulating the vital sphere that was developed in Britain. After all, he

argues, in its purest form, liberalism signals a critique of state reason coupled with attention to the technological means of bringing about forms of government detached from totalizing forms of sovereignty. Whereas police represented a political technology that was happy to intervene as much as possible, liberalism demands continual suspicion of the means and ends of government (100-02).⁵⁸

This liberal challenge to totalitarianism is, according to Osborne, what distinguishes public health policy from state-sponsored espionage, the latter of which instituted the kind of universal healthcare epitomized by the medical police. In his essay on “Health and Statecraft,” he presents the liberal recognition of the indeterminacy of the concept of health in relation to policy as the critical factor that enabled the transition away from the interventionist approach of medical policing. He argues that a liberal approach to health tends to direct health policy at a certain distance precisely because it embraces the unavoidable indeterminacy of administering health.⁵⁹ It

⁵⁸ It should be emphasized that liberalism in this sense does not represent a substantive doctrine or practice of government as much as a recurring critique of state reason and politics (Barry, Osborne, and Rose 8). From this perspective, the emergence of liberalism coincides with the realization that excessive governing could ultimately thwart the ends of government (Barry, Osborne, and Rose 8). For early liberal thinkers, it became increasingly clear that state intervention distorted the object to be governed (Osborne, “Health and Statecraft,” 183). By extension, liberalism effectively undermines *raison d’État*; it challenges the assumption that the State is able to have sufficient knowledge of what has to be governed—that is, an adequate knowledge of itself, the state—on the basis of which it can act in accordance with its own interests, in order to, for instance, increase its wealth *vis-a-vis* other states (Burchell 22). In critical response to mercantilism, for example, economic thinkers such as Adam Smith and the physiocrats epitomized this liberal problematization insofar as they demonstrated that attempts to direct individuals' actions on the basis of the collective good are harmful since the collective good is in principle incalculable. As this turn to a more *laissez-faire* economic policy illustrates, liberalism doubts the rationality of the state and the possibility of it, or anyone, being able to know perfectly and in all of its details the reality to be governed (Burchell 22).

⁵⁹ Osborne’s search for a distinctly liberal approach to medicine leads him to the British nineteenth-

emphasizes the provision of infrastructural conditions for healthy living—such as effective sewage clearance and a clean water-supply—rather than intervening directly in the lives of individuals and families. Using these examples to demonstrate that the respect for indeterminacy at the heart of liberalism does not, as some might argue, necessarily entail retrenchment in the field of health policy, Osborne upholds such indeterminacy as something that “we have to live with—even defend” (180). He is confident that

one has only to consider the political consequences of attempts to absolutize—to make determinate—the concept of health, to see the pertinence of this. It often seems as if such initiatives tend in the direction—putting it contentiously—of a *polizeiwissenschaft* of health; policy reverts to its root, *police*. And if, indeed, one thinks of those kinds of regime that have attempted to make health a goal of political ideals, it is difficult to

century revolution in urban sanitation, in part, because, following Foucault, he recognizes the focus of a liberal government to be not the territory of the body, but rather the ensemble of a population. Accordingly, he recognizes the role of this form of governance to employ ‘mechanisms of security’ that will assure the integrity of the natural processes of the population, (“Security and Vitality” 102) an approach that he considers to be epitomized by the Victorian sanitary reforms that sought to provide the conditions of health without intervening directly in the life body of the population. But, unlike broad sanitary measures, which were attempts to govern health from a distance, the practice of variolation that gained prominence in England in the mid-eighteenth century *did* intervene directly in the territory of the body. Pointing to the individuating nature of vaccination, Cohen provides a succinct schema to consider Frank and Jenner as personifying two distinct medical rationales: “If Frank champions a medical project that simultaneously encompasses the individual citizen’s entire life as well as the lives of all citizens as a whole, Jenner offers a singularizing protocol that endeavours to alter a specific disease’s effects on particular individuals. . . He attends solely to the singular context from which a specific infection arises and within which he hopes to modulate its effects — even if he ultimately aspires to propagate such modulations throughout the “whole world” (86). Through the calculus of probabilities, modern immunization strategies brought the body to the fore of public health interventions, reinforcing Foucault’s observation that the task of governing life at the level of the population made methods of controlling human bodies all the more necessary (*Security* 143).

resist a certain pressure to shudder inwardly (180).

Happy to leave the legacy of medical policing behind as a vestige of mercantilism and *cameralism*, a warning against absolutistic approaches to health, Osborne is hopeful that the liberal development of public healthcare in nineteenth-century England effectively rescued the administration of health from the state's agenda to advance its most valuable resource: the population. "Nineteenth-century public health," he argues, "points to a domain that is not simply that of the maximization of a population by a State, but the regulation of something positive in its own right—'public health'—via infrastructural techniques that were designed to monitor it as a kind of dependent variable" ("Security and Vitality" 106). Informed by a political rationality that explicitly denounces *raison d'État*, he suggests, the health of the population under liberalism could be respected for its own intrinsic value. It was no longer merely the means of achieving the state's military and political agendas.

While I share Osborne's predilection for broad sanitary reforms—such as providing clean drinking water and effective sewage clearance—I contend that such an approach to health is life-affirming only insofar as it provides the conditions of health without imposing risk on the lives it endeavors to protect. That is, I do not attribute the life-affirming potential of sanitation to the liberal recognition of the indeterminacy between health and policy. After all, the modest attempt to govern health from a distance by providing its conditions of possibility is only one of the ways in which England's response to this

indeterminacy continues to inform contemporary public health initiatives. As we will see, another strategy, developed as early as the mid-eighteenth century in England to legitimize variolation, is to address the inevitable uncertainties that surround the question of immunization with the calculus of probabilities. In direct contrast with the Victorian promise to govern health from a distance, the response to indeterminacy that folded immunization into the rationality of probabilities used the many uncertainties that surround health not to abstain from direct intervention, but to legitimize it. By subjecting risk to rational calculation, the problem of indeterminacy was transformed into an even more effective form of governing and regulating the population. The identification of certain groups as “at risk” or “high risk,” for example, allowed governing powers not only to develop strategies to intervene more discriminately, but also preemptively. And so, while the liberal acknowledgment of the indeterminacy between health and policy ostensibly challenged the authority of state power and promised to reign in its reach, risk analysis and the calculation of probabilities provided a rationality to justify intervention in the face of this uncertainty.

Further disrupting the caricature of liberal England protecting the integrity of individual citizens against Germany's absolutistic interventions, more recent historical studies of policing have discredited the long-held thesis that the notion of 'police,' so central to modern European political thought, lacked a

comparable concept or system in England.⁶⁰ Such counterevidence suggests that the relative absence of discourse pertaining to the medical police in England, and the gradual acceptance throughout Europe of the idiom of public health, shows us more about the political tactics used to represent the enforcement of public health than it does about any actual changes in the way such intervention developed. That is, rather than “public health” emerging as a new government strategy to reflect a new, liberal political reality, in view of this evidence it seems more likely that a new idiom emerged to portray the medical police in a way more palatable to those who resisted the police force as the antithesis of liberty (Carroll 464). By denying that the decline of mercantilism and the rise of political economy led to a decline in policing and a corresponding rise of persuasion and education, such historical accounts help resolve important discrepancies that inevitably emerge in attempts to polarize the absolutist German medical police and liberal English public health strategies. As Baldwin insists, in view of his extensive reading of the history of public health in modern Europe, the assumption that the decentralized *laissez-faire* approach supposedly characteristic of the British permitted only few and, at best, liberal public health interventions, is completely dubious, as is the corresponding belief that the centralized continental administrations reinforced by the ideology of medical police were ready and able to act more broadly and effectively (530). He notes that even contemporaries recognized the failure of

⁶⁰ For comprehensive literature reviews, see Dodsworth and Carroll.

such caricatures: “The French especially were chagrined at the extent to which the British, proud of their individual liberties and decentralized government, could nonetheless impose precautions of a stringency only dreamt of by Gallic reformers (527).

The dichotomization of modern England and Germany in the literature has also been challenged from another perspective, namely the body of predominantly German historiography that responds favorably to the absolutistic policies of German territories. Rather than approach the historical roots of public health as a past from which we need to extricate contemporary medical practices, such readings celebrate medical policing and enlightened absolutism as major protagonists in the development of modernity. For example, focusing specifically on the value of the medical police, Henry Sigerist identifies its exemplar, Johann Peter Frank, as “one of the most outstanding figures in the great public health movement that took place in the second half of the 18th century” (Introduction 81), explicitly challenging the idea that “Germans enforced health through brute force while the English humanely educated their citizens” (*Civilization and Disease* 92). For his part, Frank was confident that each and every citizen benefited from the state's involvement in their health and prosperity:

How lucky is a society, whose leaders do not merely depend upon the sympathy of the better citizens and doctors, but who allot some aid to the needy father who

has taken ill, [and] to all truly indigent down-at-the-heel people; and who testify thereby to the influence that the well-being of the last link has on the great chain, through which citizen is linked to citizen and in which no part can suffer without a corrosive rust affecting the others! (qtd. in Broman 62).

Furthermore, insofar as Frank recognized the limitations of medicine to address the primary cause of disease—namely, poverty—he emphasized the importance of promoting the social conditions of health rather than retroactively treating disease. As outlined above, the environmentalist approach that Victorian England favoured has a long history in Western medicine, one that has certainly not been restricted to liberal forms of government. In view of this glaring oversight, it seems as though the concern that the state's recognition of the population as its most valuable resource necessarily exposes citizens to potential violence might stem from an imposition of certain liberal biases. More specifically, such a concern tends to arise when the distinct concepts of state and civil society inform our interpretations of medical policing despite the fact that such concepts had not yet been conceptually parsed apart as independent spheres in the mercantilist and cameralist societies in which medical policing emerged. And in view of the attempts made in early-nineteenth-century Germany to develop prophylactic strategies that shield a community from infectious disease without imposing

risk on individuals, we can better appreciate how the good of the community could have been synonymous with that of its members.

As a corrective to the more polarizing reading of national differences in public health intervention, I follow Baldwin's suggestion that the pertinent distinctions to be drawn are not between interventionism and laissez-faire, action and inaction, authoritarianism and liberalism, but rather between "different forms of intervention, some more drastic and apparent, others more subtle, but nonetheless effective for that" (Baldwin 535). Reinforcing this perspective in view of historical evidence, Patrick Carroll also finds it more illuminating to account for differences between various instantiations of medical police "less in terms of intervention versus no intervention, and more in terms of what kind of intervention" (468). More relevant than state legislation, political ideology, or the priority given to the individual *vis-a-vis* the community, I contend that the most pertinent question that emerges when we attempt to disentangle certain public health initiatives from biopolitics' capacity to endanger the life it intends to protect is whether or not a particular medical intervention legitimizes the active introduction of harm. It is from this perspective that I consider the extent to which specific preventative medical interventions perpetuate the logic that certain segments of the population can be exposed to potential harm for the greater good. I contend that if certain aspects of *medizinische Polizei* make us shudder, it is first and foremost because we are concerned that its calculation of the value of its citizens

implies that life is instrumentally rather than intrinsically valuable, a claim that can be used to legitimize the sacrifice of certain members for the good of the whole. And, as I will demonstrate, this logic is also operative in medical procedures that reduce the morbidity and mortality of communicable diseases by discriminately distributing the risks of prophylaxis throughout a population.

Chapter Three: The Rationalization of Risk and its Break with Rationality

Foucault identifies the modern approach to immunization as an unprecedented development in the history of medicine, notable for the specific methods its proponents designed to calculate the variable risks surrounding infectious disease and its prevention. In contrast with legal and disciplinary approaches that address individual bodies, Foucault distinguishes modern mechanisms of security that consider the population as a whole and in the context of a series of probable events (*Security* 20). Applied to the question of inoculation, the problem was hardly a new one: Do the risks associated with infectious disease justify assuming the risks of deliberately conferring immunity? Yet those confronted with the decision to intentionally acquire immunity were no longer left to their own limited discretion; for better or worse, unlike premodern methods of conferring immunity, modern methods were supported by a calculus of possibilities according to which risk was not only something to be considered at the level of the individual, but something that could be rationalized in view of the population as a whole. More specifically, to determine inoculation's value, its exponents regularized smallpox's "lottery-like nature by statistically normalizing its individual occurrences across a population" (Cohen 97).

Like Foucault, Beck identifies an emphasis on the calculability of risks with the rise of modernity and industrialization. In *World Risk Society*, he observes that, in contrast with the threats characteristic of premodern

societies—such as plagues, famines, and natural catastrophes—threats that were deemed incalculable because they were attributed to external, supernatural causes—modernity transformed these hazards into calculable risks. According to Beck, the fundamental difference between the human dramas of the past and contemporary “risks” is that the latter are based on decisions, or, “more specifically, decisions that focus on techno-economic advantages and opportunities and accept hazards as simply the dark side of progress” (50). In short, contemporary risks “presume industrial, that is, techno-economic, decisions and considerations of utility” (50). Beck considers the consequence of this transition to be fundamental: no matter how devastating, preindustrial disasters were experienced as “strokes of fate” such that the countless accusations that they invoked were “religiously motivated” and not—like industrial risks—politically charged. Providing insight into the interminable controversy surrounding the question of vaccination, Beck reasons that since contemporary risks have their origins in decision-making, “the problem of social accountability and responsibility irrevocably arises, even in those areas where the prevailing rules of science and law permit accountability only in exceptional cases” (50). Indeed, as Beck presents it, one of the greatest paradoxes of a society governed by the navigation of risk, a risk society, is that despite its emphasis on decision-making and, by extension, accountability, the non-localized nature of contemporary risks and their potential long-term effects renders them as incalculable as premodern

catastrophes.⁶¹ The emergence of antibiotic-resistant superbugs, for example, points to the paradoxical way in which the attempt to diminish risks, in this case the risks associated with certain infectious diseases, can give rise to even greater risks that are even more challenging to address. The attempt to mitigate risks, in short, creates the conditions for new, hitherto unimaginable, risks.

Medical Verification in the Face of Uncertainty

In the attempt to influence the life of the population despite the inevitable indeterminacy between intervention and outcome, statistical analysis proved to be an indispensable tool. As Foucault observes, more important than knowledge of the corpus laws or skill in applying them, at the level of the state, governance requires knowledge of the things that comprise the reality of the state: statistics (*Security* 354). While the term was first coined in the mid-eighteenth century in Germany to denote qualitative descriptions of the state, in the late seventeenth century, England had already developed political

⁶¹ In the case of epidemics, even though infectious diseases are still widely thought to have “natural” (if no longer supernatural) origins, they nevertheless fall under the domain of human action insofar as we attempt to control their spread. Indeed, as soon as an effective preventative technique becomes available, it becomes increasingly difficult to accept disease as a natural occurrence. The news headlines are telling: “Unvaccinated child contracts measles,” for example, and “Vaccinated child contracts measles, outbreak has some parents concerned.” Whether we fault someone for not taking preventative measures or technology for not providing full protection, it is difficult to find an instance of infectious disease that is not in some way, either positively or negatively, attributed to human action. In short, the potential for human intervention frames the entire field of communicable disease, culminating with the emergence of human-generated diseases. Whether through deliberate acts of bioterrorism or the unintended “side-effect” of certain medical technologies to give rise to particularly virulent pathogens, in the field of epidemiology we find the tendency, that Beck highlights elsewhere, for technology to generate more problems than it can resolve.

arithmetic to quantitatively assess the wealth and power of the state, and in the eighteenth century, mathematicians created the calculus of probabilities, a new field of study that treated chance mathematically (Rusnock, "Medical Statistics," 351). The introduction of statistics to the field of medicine is usually traced back to early nineteenth-century Paris hospital medicine, but statistics also has significant roots in eighteenth-century Britain. In fact, the numerical arguments that proponents of inoculation used in support of prophylactic practice are arguably the first use of numerical evidence to evaluate a medical practice (Rusnock, "Weight of Evidence," 289).

The medical acceptance of the calculus of probabilities in England was, in large part, influenced by Locke's epistemological investigations, which, according to Nelly Tsouyopoulos, had the first decisive philosophical influence on modern medicine (*Röschlaub* 192).⁶² Often considered the first of the great English empiricists, Locke's *Essay Concerning Human Understanding* grapples with the limitations of our capacity to know the world. Apart from the few things that we can know for certain, such as our own existence and the nature of mathematics, Locke maintains that we are otherwise left to act without certain knowledge. He found probability to be a suitable basis for action, convinced that our intellectual task is not to know everything, but only those things that pertain to our behaviour.⁶³

⁶² See Tsouyopoulos 192-95 for a summary of the various ways in which Locke's philosophy influenced medicine, including the dynamic relationship between the organism and environment that would later find warm reception by the German Romantics.

⁶³ In this account of Locke, I do not address the philosophical question of how best to interpret Locke's epistemology, but rather the historical question of the impact that his work had on the medical

Following Locke's assertion that the weakness of our faculties makes it impossible to have positive knowledge of the external world, many English thinkers accepted that experience and history can only ever grant us probable knowledge. From this perspective, the primary task of rationality was to determine the probable truth of phenomena in the external world by examining all grounds of probability. Indicating the need for credible testimony, the highest degree of probability was deemed to be calculable in the context of general consent, that is, when all witnesses report the same experiences with regard to certain matters of fact. Though one can never be certain that generalizations from specific data are true, the calculus of probabilities was generally accepted as the most rational method of decision-making in the face of uncertainty. It was in keeping with this standard that proponents of inoculation submitted to mathematical analysis the variables informing related decision-making processes (Miller 113).

Pointing out the congruity between vaccination and variolation and the calculus of probabilities, Foucault identifies four characteristics about them that did not typically describe other medical practices of the time. Both techniques “can be generalized, are certain, preventative, and absolutely inconceivable in the terms of medical theory” (*Security* 86). Honing in on the generally applicable character of inoculation, Foucault argues that these features made it possible to approach the question of acquired immunity in

tradition, in particular on the use of medical statistics to support the practice of inoculation.

probabilistic terms. The convergence with statistical analysis of variolation, and later, vaccination, he continues, was essential to their integration into an accepted field of rationality, since both methods were completely heterogeneous with respect to medical theory at the time (*Security* 86).⁶⁴ Historically, medical professionals have often derived their authority from an explicit, discursive linkage between theory and practice, and from the high valuation that their society placed on that linkage (Broman 10). The justification for using variolation as a medical procedure was based on the observation that survivors of smallpox did not usually succumb to the disease a second time. But this knowledge was common knowledge and, as such, could grant inoculators expertise neither on the subject of smallpox nor on its prevention. The justification of variolation practices by the realm of medical arithmetic thus raises important questions about whether statistics have been deployed in medicine wherever contemporaneous medical theory has been incapable of providing an authoritative theoretical account of why a particular practice might or might not work (Rusnock, "Weight of Evidence," 305-06).

At the time that statistical analysis was first extended to the field of medicine, it was generally accepted that smallpox posed one of the greatest threats to the vitality of a population. So prevalent and dreaded was the

⁶⁴ See also Rusnock's "The Weight of Evidence and the Burden of Authority": "The correspondence and publications addressing inoculation in eighteenth-century Britain indicate that numerical and probabilistic arguments were enthusiastically embraced, at least by some members of the public, thus confirming observations made by historians such as Patricia Cline Cohen, James Cassedy and John Money, that numeracy in all its many facets was on the rise in the eighteenth century" (305-306).

disease, that parents did not count their children until their children had survived it (Miller 31). The first statistical records of causes of death, compiled during the seventeenth and eighteenth centuries, indicate that smallpox was high on the list of the great "killers," with roughly six to ten percent of all deaths resulting from it. Children under five years were the most frequent victims of smallpox. . . Contemporaries estimated that about 80-85 per cent of the population contracted smallpox at some point during their lifetime. Estimates of the mortality rate vary, but overall between one in six and one in ten smallpox victims died. Sometimes it was as many as one in three, depending on the severity of the epidemic (Huerkamp 618).

While smallpox was usually endemic in urban centers, where it was almost exclusively a childhood disease (Blower 275), there were, in less densely populated areas, usually a few years of relief before another epidemic would strike again. Here too the disease would discriminately infect young children, in particular those born after the previous epidemic, since they had not yet become immune through having had smallpox before (Huerkamp 618). Many people did not even try to prevent their children from becoming infected, but instead sought an ideal time for their children to contract the disease, usually during a relatively mild epidemic (Huerkamp 618-19). In rural communities

throughout Europe, “buying the smallpox” or *Pockenkaufen* became a common custom according to which children were sent to the home of a patient recovering from a mild case of the disease in order to buy crusts for a penny or two (Miller 43; Huerkamp 619). After all, it was generally recognized that when someone contracted smallpox and survived, they were usually immune from the disease for the rest of their lives.

From this perspective, there was only a small shift from the lay practice of deliberately exposing children to smallpox, to the medicalization of variolation (Huerkamp 619), and indeed, some accepted the medical procedure as part of the “vibrant self-health culture of healing that characterized the first half of the nineteenth century” (Durbach Ch. 1, location 421, par. 14). Yet the rationalizations developed to justify the inoculation of smallpox were worlds apart from the local forms of knowledge that prompted parents to expose their children to the circulating disease. As Cohen notes, the numerical analyses developed in support of inoculation not only endorsed the procedure itself but also, *as a means of endorsement*, provided a way to recognize and evaluate the procedure's consequences. In other words, inoculation “involves two distinct and yet deeply entangled innovations: as a preventative medical technique, it also spurs an important new mode of medical verification” (91).

The Royal Society and its Rational Reduction of Risk

In view of smallpox's dual promise to both devastate bodies and offer them future protection, at the beginning of the eighteenth century, the method of inoculation practiced in Constantinople started to gain attention in Europe, and by the second decade, an ever widening circle was familiarizing itself with a new means of rendering smallpox less hazardous (Miller 48-55). Widely recognized as the hub of scientific and medical communications from all parts of the world, the Royal Society of London was often the center and facilitator of such exchanges and in this influential position played a significant role in the general acceptance of variolation in England. Indeed, although Lady Mary Wortley Montagu's (1689-1762) arrangement to have her three-year-old daughter inoculated in April 1721—after having witnessed the procedure in Constantinople—is widely recognized for its role in popularizing the technique, it is clear that her enthusiasm “would not have sufficed to propel the practice, just as the isolated inoculations in Germany and Hungary during the same year, and in France even two years earlier, did not initiate the practice there” (Miller 24). Not even the public Newgate medical trial, initiated five months later by the royal family—in which six prisoners were inoculated and, after all fully recovered, were released—was enough to sway public opinion. And when the Prince and Princess of Wales arranged to have two of their daughters inoculated the following year, the potential for this public procedure to convince at least some skeptics was foiled by reports of the death of the

Earl of Sunderland's two-year-old son, allegedly from the inoculation he had received two weeks prior. Rather than enlighten the public about the safety and efficacy of variolation, these highly publicized events "precipitated a decade of pen warfare which brought the whole issue before the literate public" (Miller 102).⁶⁵

While some embraced inoculation as a reasonable response to the inevitable reality of a virulent disease, the prophylactic practice was also the subject of significant criticism, much of which arose from within the medical community. The "artificial" smallpox infection induced by variolation was generally considered milder than the "natural" smallpox that one otherwise contracted. But some argued that it could also take a bad, at times deadly, turn. Many accordingly found that the procedure contradicted the medical maxim to "first do no harm." Conversely, others voiced the concern that, owing to its relative mildness, the protection resulting from inoculation was not always permanent and, in some cases, someone who had been inoculated in childhood could contract smallpox as an adult, when the disease was considered even more dangerous. Finally, in the argument that proved to be the most compelling, some insisted that the process of inoculation was itself known to start an acute smallpox epidemic, putting other members of the community at risk (Huerkamp 619).⁶⁶ And so, even when variolation was

⁶⁵ Compare with Rusnock, *Vital Accounts*, 45 and Maehle, "Conflicting Attitudes," 198.

⁶⁶ See also Maehle, "Conflicting Attitudes," 203-05 and Maehle, "Ethics of Prevention," 93-4. Other non-medical arguments against variolation included the religious argument that inoculation interfered with divine providence and the nationalistic argument that because of its non-European origins, this foreign practice could not be trusted (Rusnock, "Weight of Evidence," 291).

regarded as the only effective available method of preventing smallpox, and there were no known effective forms of treatment, controversy continued to rage over its efficacy and over its potential danger both to the individual and to the community (Bradley 7).

In the attempt to introduce clarity to the ongoing pamphlet war circulating around the issue of inoculation, in 1722, London-based physician and Fellow of the Royal Society John Arbuthnot (1665-1735) was among the first to use numerical evidence to evaluate a medical practice, a move that proved to be decisive in subsequent debates over inoculation (Rusnock, *Vital Accounts*, 44). In response to his opponents' complaint that the outcomes of inoculation were uncertain, Arbuthnot argued that certainty was impossible to find in any human affair, especially any medical or surgical intervention. But he insisted that this was not reason to avoid such interventions. On the contrary, people should allow themselves to be guided by the strongest probabilities and, in the case of smallpox, inoculation had a clear numerical advantage over death by natural smallpox (Miller 111). As Genevive Miller notes, it was not accidental that the statistical method was first applied to medicine in England at a time when Isaac Newton occupied the chair of the Royal Society. In this intellectual climate, all kinds of phenomena, including the biological, were believed to be suitable subjects of analysis via mathematical abstraction and manipulation (24). Reliance on numerical analysis provided a new metaphor for rationality as well as an element of

rational decision-making, and coincided with an “epistemological investment in the notion that material processes, both natural and social, operate according to fixed natural laws determining recognizable if not predictable regularities” (Cohen 92). For his part, Arbuthnot was well practiced in bringing mathematics to bear on topics not typically treated quantitatively. He was convinced that knowledge of a subject could only ever be small and confused unless it was reduced to mathematical reasoning (Rusnock, *Vital Accounts*, 46). Eager to subject the controversial uncertainties surrounding inoculation to numerical analysis, Arbuthnot combed through the London bills of mortality and created a table with columns, respectively for total burials and burials attributed to smallpox for the years 1707 to 1718, inclusive. Based on the estimate that 1 in 10 deaths over the age of one were due to smallpox, he argued that because all inhabitants in London encountered smallpox at some point in their lives, 1 out of 10 people who contracted the disease would die. He then compared this rate to the 1 out of 100 chances of dying from inoculation (a ratio presented without evidence). In view of this comparison, he argued that a practice that reduces the mortality of small pox from 1 in 10 to 1 in 100 would, if practiced universally, save the city of London at least 1 500 people yearly, and that the same odds would also appeal to any rational private person (Rusnock, *Vital Accounts*, 48-9). While Arbuthnot's emphasis on the interests of the state was reminiscent of mercantilist arguments for increasing the population, his argument also address the interests of the

individual (Rusnock, *Vital Accounts*, 49). He maintained that the numerical advantage of inoculated smallpox over the natural disease united the interests of the individual and the collective in favour of the prophylactic procedure: individuals would reduce their chances of dying and the State would thereby increase its population.

While Arbuthnot's anonymously published pamphlet enjoyed some popularity (Rusnock, *Vital Accounts*, 47), it was the numerical analyses of James Jurin (1684-1750), the "chief architect of this numerical approach" (Rusnock, "Weight of Evidence, 14), that most significantly altered the discourse surrounding the question of inoculation. Highly regarded for his vigorous support of Newtonian ideas, Jurin was well placed among the intellectual elite of London and was also well known to savants in Europe and North America. In short, he "epitomized the enlightened ideals of English culture" (Rusnock, "James Jurin," 8).⁶⁷ As the secretary to the Royal Society, he had access to a wide network of correspondents and, in this capacity, could base his figures for inoculated smallpox on empirical reports. Likely familiar with Arbuthnot's approach to the question of inoculation (Rusnock, "James Jurin," 23), Jurin was prompted to weigh in on the subject by his correspondence with Yorkshire physician Thomas Nettleton (1683-1742). As

⁶⁷ As indicated by his concern for the livelihood of his fellow citizens and optimism that medical innovation could cure the ills of humanity, Jurin's pioneering efforts to establish smallpox inoculation were very much informed by the rationality of the enlightenment and were well received as such. Voltaire, for example, who became a passionate advocate of inoculation during his stay in the late 1720s (Maehle, "Conflicting Attitudes," 198), considered himself to be a disciple of Jurin, and exclaimed that "Who loves liberty must live in England; who loves truth ought to read your good authors and especially Mr. Jurin" (qtd. in Rusnock, "James Jurin," 8).

one of the first physicians to inoculate individuals outside of London, Nettleton was met with considerable resistance in his community and suggested to Jurin that the only way that inoculation could be established in Britain against the prejudices that it faced was to compare the dangers of inoculated and natural smallpox (Miller 111; Rusnock, *Vital Accounts*, 52).⁶⁸ Actively pursuing this line of inquiry, Jurin maintained that he had no intention of becoming entangled in the heated controversy surrounding the issue and was determined to provide nothing but “matters of fact” (Rusnock, “Weight of Evidence,” 292). His first paper on inoculation, presented to the Royal Society in 1723, brought together all the statistical evidence available at that date, including figures from Boston, the London Bills of Mortality from 1667-1687 and 1701-1722, as well as information supplied by the few physicians practicing inoculation in England at the time (Miller 115; Rusnock, *Vital Accounts*, 51). Based on these numbers, he concluded that the risk of dying from smallpox was nearly 2 out of 17 and that the recorded deaths due to inoculated smallpox were much lower: in New England, 1 in 60 had died, while in England only 1 in 91 cases (Miller 115). In short, he offered “a plain proof from Experience and matters of fact that the small pox procured by Inoculation (even by the accounts of those that oppose that practise) is far less dangerous, than the same Distemper has been for many Years in the Natural Way” (qtd. in Miller 115). Unlike Arbuthnot, Jurin based his estimates

⁶⁸ See Nettleton 117-20.

of deaths caused by inoculated smallpox on empirical sources and they were, as such, better received (Rusnock, *Vital Accounts*, 51). Jurin's figures were widely cited in England and on the continent and—a testament to their authority—very few attempts were made to verify his numerical ratios until the end of the eighteenth century (Rusnock, "Weight of Evidence," 290).

Acknowledging that his numerical analyses did not address the question of whether or not any particular individual would contract smallpox and, if so, whether that person would die from it, Jurin was nevertheless confident that comparing an estimate of the hazard "which all of Mankind, one with another, are under of dying of the natural Smallpox," with the hazard of inoculation, "the Publick may be enabled to form a Judgment, whether or no [*sic*] the Practice of Inoculation tends to the Preservation of Mankind, by lessing the Danger to which they are otherwise liable" (qtd. in Cohen 90). The rationality of this numerical approach prompted people to base their decisions on an overview of the population as a whole and not to be swayed by occasional reports of inoculation gone badly. It asked them to override their limited assessment of the variable factors—for example, the severity of the approaching epidemic, the relative health of their child, and the competence of the local inoculator—and defer the decision-making process to analysts like Jurin who had access to authoritative accounts that gave an accurate overview of the whole. In fact, a significant part of Jurin's campaign was devoted to arbitrating controversial cases or, more precisely, undermining

claims of death caused by inoculation or incidents of natural infection in children despite their having undergone the procedure.⁶⁹

Waning Immunity and Waning Authority

The calculus of probabilities introduced a new area of expertise to the question of inoculation. While medical physicians could contribute little to explain why survivors of smallpox usually did not succumb a second time to the disease, insofar as the former appealed to rational mathematical arguments, inoculators could nevertheless continue to practice with authority. Foucault accordingly credits the calculus of probabilities with ushering immunization into accepted fields of rationality at the time. Yet, as Beck's analysis of 'risk society' demonstrates, "the essential and momentous consequence" that arises when we approach contemporary phenomena in terms of their relative risks lies in the fact that "in definitions of risk the *sciences' monopoly on rationality is broken*" (Beck, *Risk Society*, 29).

Elaborating on this point, Beck notes that when risk analyses are made, there are always competing and conflicting claims, interests, and viewpoints. In other words, there is no expert on risk: "in matters of hazards, no one is an

⁶⁹ See Rusnock: "Despite this widespread acceptance, many difficulties beset Jurin's numerical investigations in medicine. To construct mortality ratios, he had first to collect and collate case histories, which required extensive correspondence with a group of geographically widespread practitioners. . . . The creation of standard narratives from the numerous individual case histories involved the extraction of consistent, quantifiable information, which then could be tallied and tabulated in established categories. Jurin's indisputable ratio of the number of inoculated and natural smallpox cases were thus the result of an arduous and at times controversial process of soliciting, selecting and sorting varied case histories" ("Weight of Evidence" 290).

expert—particularly not the experts” (*World Risk Society* 58). From this perspective, Beck makes the following provocative claim:

Science's rationality claim to be able to investigate objectively the hazardousness of a risk permanently refutes itself. It is based, firstly, on a house of cards of speculative assumptions, and moves exclusively within a framework of *probability statements*, whose prognoses of safety cannot even be refuted, strictly speaking, by *actual* accidents. Secondly, one must assume an *ethical point of view* in order to discuss risks meaningfully at all (*Risk Society* 29).⁷⁰

By bringing the rate of death by smallpox into mathematical relation with the mortality rate of inoculation, such risk analyses implicitly value above all else the preservation of human life and, from this perspective, both causes of death—variolation and “natural” smallpox infection—are considered to be ethically on par. Jurin’s appeal to lower rates of death by artificially induced smallpox as compared to natural smallpox did not address the concerns raised by religious and medical men, whose objections were, respectively, that variolation interfered with divine providence and that it breached all maxims of ethical practice by actively introducing illness (Rusnock, “Weight of Evidence,”

⁷⁰ To illuminate the first problem—that statements of probability cannot, in principle, be refuted—it is helpful to consider a simple example. The statement “The probability that it will rain tomorrow is 1/5,” made “with respect to such and such evidence,” can never itself be empirically confirmed. Tomorrow we will see either rain or not-rain, but we will never see a rain of probability 1/5 (Carnap 192).

291). From these critical perspectives, the options of dying from natural causes versus as a result of medical intervention are not ethically neutral, and Jurin's attempt to avoid "entanglement in the heated, ongoing disputes and [provide] instead only 'matters of fact'" (Rusnock, "Weight of Evidence," 292) at best only suspends religious and ethical considerations and at worst obfuscates them. In either case, it certainly cannot resolve them. In this way, the calculus of possibilities permits what Beck refers to as a type of "technological moralization" that no longer needs to employ ethical imperatives directly. It replaces the categorical imperative by comparing, for example, different mortality rates under different conditions. By submitting the decision-making process to numerical calculations, the calculus of risk exemplifies what Beck calls "a type of ethics without morality, the mathematical ethics of the technological age" (*World Risk Society* 51).

Ethical objections aside, early risk analysts were also unable to address the concern that, by failing to provide lifelong immunity, variolation delayed patients' disease susceptibility to a time of life when the risks of complication were greater. As Beck warns us, the primary question generated by recourse to risk analysis is, "[h]ow does modern society deal with self-generated manufactured uncertainties?" (*World Risk Society* 31). In short, the harms generated in the process of techno-industrial development are—by all existing institutional yardsticks—neither calculable nor controllable (*World Risk Society* 31). Though observations that immunization did not always

provide lifelong immunity were well documented, since they were impossible to quantify statistically, occurrences were all but absent from the risk analyses that helped usher variolation into the fields of rationality. For his part, Jurin acknowledges that whether or not inoculation provides “effectual Security” against smallpox is an important factor in the decision to undergo the procedure (Rusnock, “Weight of Evidence,” 296), but such consideration does not actually factor into his calculations. He simply claims that there was “no Instance as far as I have been able to learn, of any one Person, either in Turkey, New England, or here at Home, who has received the Small Pox by Inoculation, that has afterwards had it the natural Way” (qtd. in Rusnock, “Weight of Evidence,” 296). When such instances did emerge—when, for example, Jurin enumerated the number of inoculated individuals to determine the risk of mortality— he simply “subtracted the number of individuals on whom the operation had no effect” (Rusnock, “Weight of Evidence,” 297). In his account for the year 1723, for example, Jurin listed 34 inoculators who inoculated 483 persons. “Of those 483: 440 had the small pox by inoculation, 5 had an ‘imperfect small pox by inoculation’, for 29 individuals the procedure had no effect, and 9 persons were ‘suspected to have died of inoculation’” (Rusnock, “Weight of Evidence,” 297). After exhibiting this tally, he subtracted the number of individuals on whom the operation had no effect, leaving the hazard of dying of inoculated smallpox to 9 in 445 or roughly 1 in 49 or 50

(Rusnock, "Weight of Evidence," 297).⁷¹ As this reductive move indicates, although Jurin was well aware of the complexity of variolation, throughout his published writings he sought to downplay these difficulties by reducing the complexity of inoculation experiences to a limited number of easily quantifiable categories, namely life and death (Rusnock, "Weight of Evidence," 298).⁷²

In this binary system, possible indications of failed immunity were not only erased from his calculations; so too were those who offered such testimony dismissed as unreliable witnesses. Indeed, Jurin devoted considerable effort to challenging case histories that undermined inoculation. In 1725, for example, when Dr. William Clinch cited a case of an inoculated child succumbing to natural smallpox, Jurin immediately contacted the offending surgeon as well as the local minister to dispute the veracity of the claims by bringing into question the character of the man who made them.

When we consider Jurin's deliberate suppression of counterevidence from an ethical perspective, his behavior is reprehensible; yet when we view it in light of the calculus of probabilities, it is totally and utterly banal, a mere function of the inherent limitations of calculating probabilities. As Beck observes

⁷¹ As Rusnock observes, "the category 'imperfect small pox by inoculation' immediately leaps out from the above list, raising myriad questions about how individuals identified smallpox, how they distinguished an 'imperfect' sort and so on" (Weight of Evidence" 297).

⁷² In this binary system, for example, a young girl left deaf and mute after inoculation was recorded by Jurin as a success since it had not resulted in death. Jurin justified such a maneuver with the argument that "if accidents other than death resulting from inoculation were to be reported, so too would conditions emanating from natural smallpox" (Rusnock, "Weight of Evidence," 298).

risk analyses must restrict themselves to the estimation of certain *quantifiable* risks on the basis of *probable* accidents. The dimensions of the hazard are limited from the very beginning to *technical manageability*. In some circles it is said that risks which are not yet technically manageable do not exist—at least not in scientific calculation or jurisdictional judgment (*Risk Society* 29).

From this perspective, Jurin was simply limiting the dimensions of his analysis to what was technically manageable. That is, although he acknowledged that reported cases of failed inoculation often dissuaded citizens from seeking variolation, he could not find an easy way to quantify the related risks. The variability of immunological responses to variolation was inherently incompatible with the effort to “statistically normaliz[e] its individual occurrences across a population” (Cohen 97). Instead of adjusting his method of analysis to account for the complexity of his subject, he denied the existence of anomalies by adjusting numbers and silencing testimonies.

The *fait accompli* of permanent immunity was, as it is now, difficult to prove. For one thing, actively testing an inoculated individual's level of protection by deliberately re-exposing her to infection with natural smallpox was and continues to be technically and ethically questionable. Although Jurin never explicitly requested information of this nature, some of his medical correspondents nevertheless did perform, and report on, such human

experiments. One doctor even urged Jurin to further coordinate such studies, concerned that the argument that “the Inoculated are liable to have the Small Pox again by Infection in the Natural Way” was often used as a “Strenuous Argument against Inoculation” (Rusnock, “Weight of Evidence,” 296). But Jurin himself did not solicit such trials, perhaps, as Rusnock speculates, because of the questionable ethics of exposing patients to infected individuals (Rusnock, “Weight of Evidence,” 296).

Perhaps Jurin also recognized that such corroborating evidence would never be enough to sway the skeptics. After all, whether by accident or experiment, even if someone demonstrates himself to be unsusceptible to natural infection, this evidence alone provides no indication of how much longer his protection will last. It certainly does not guarantee lifelong immunity. Jurin was painfully aware of this limitation and lamented the difficulties of proving the existence of lasting protection, especially in view of how easy it is to disprove it. In his *Account* for the year 1725, for example, he writes:

But though the affirmative Side of this Question cannot be fully establish'd under a considerable Length of Time, and a great Number of Experiments; the Negative may indeed admit of an easier Proof: For a Number of Instances of Persons receiving the Small-Pox by Inoculation, and having them afterwards in the natural Way, will be sufficient to convince the Publick, that

Inoculation is no Security from the natural Small-Pox

(qtd. in (qtd. in Rusnock, "Weight of Evidence," 303).

And yet, the capacity to predict how long an individual remains protected is necessary for evaluating one's relative risks of natural infection and, by extension, the protection one provides the community. Were this information accessible, its inclusion would certainly provide more accurate results than could be obtained by simply comparing the relative risks of dying from natural versus inoculated smallpox, as if the decision to vaccinate were necessary but once in a lifetime. But in its absence, Jurin was left with little choice but to base his calculations on the assumption that variolation offers lifelong protection. While the problems of waning and failed immunity are undoubtedly important factors in the risk-benefit analysis of immunization, his commitment to numerical analysis prompted him to act as though risks that could not be quantified simply did not exist.

Although testimonies of imperfect immunity presented a considerable challenge to Jurin's numerical defense of universal immunization, compared with the criticisms leveled against vaccination, there was only a small margin of objectors who contended that variolation failed to provide lifelong immunity. Albeit associated with a relatively high level of risk, since it involved inoculation with a natural strain of smallpox, the assumption that successful variolation conferred complete subsequent immunity was (and for the most

part continues to be) relatively uncontroversial.⁷³ Indeed, even after Jenner popularized vaccination, variolation remained popular in England, in part because people preferred what they considered the real thing (Durham Ch.1, location 435, par. 14). Insofar as vaccination was preferred to variolation, it was not because it promised greater protection but rather fewer risks. As Peter Razzell summarizes, vaccination, unlike inoculation, was generally considered to be a safe injection, “both for the person injected and the unprotected population exposed to him, and this was the reason why inoculation was replaced by vaccination” (ix).⁷⁴

Though the problem of waning immunity persisted when vaccination eventually displaced variolation, and, in some cases, became even more acute, the tradition of dismissing testimonies of natural infection in those who had previously been vaccinated continued. For his part, Jenner was quick to acknowledge the body of counterevidence that challenged the results of his

⁷³ See, for example, Bradley: “[Bernoulli] assumes, justifiably, that successful inoculation confers complete subsequent immunity” (10) and “[D’Alembert] has to admit that the danger of inoculation, once overcome, is over for ever, whilst the monthly risk of natural smallpox recurs every month of life until one catches it” (11). According to Razzell, “no-one has queried the prophylactic power of inoculation to protect against attacks of smallpox.” On the contrary, it is generally agreed that “being severer in its effects than vaccination, it produced . . . a much longer period of immunity (usually for a lifetime)” (ix). See also Rusnock: “Smallpox inoculation referred to the procedure of taking matter from a pock on someone infected with smallpox and inserting it in a small incision made on the arms or legs of a healthy individual. A mild case of smallpox typically ensued, but not always. Inoculation was known to cause death, but in the majority of cases, it provided lifelong immunity to natural smallpox” (“Medical Statistics” 337).

⁷⁴ Razzell then goes on to undermine the polarization of vaccination and inoculation, “with the one being viewed as safe and effective, the other as dangerous and demographically damaging,” and in turn question “the actual historical contribution of inoculation in reducing smallpox mortality” (ix). His primary argument is that “the vaccines used in Jenner’s lifetime were in fact derived from smallpox virus, and that early vaccination was a form of inoculation” (ix). While interesting in its own right, Razzell’s thesis does not weigh down much on my own considerations of the efficacy of acquired immunity. As I will demonstrate, whether the early vaccines were cowpox or attenuated smallpox, the uncertainty surrounding how long they provided protection remained.

Inquiry; he was simply reluctant to admit that such findings disproved his hypothesis. Instead, he attributed cases in which vaccination apparently failed to confer lasting immunity to the difficulty of achieving successful vaccination in light of the procedure's technical sophistication. Jenner was concerned that such practical difficulties would undermine the value of his important findings and warned that inexperienced vaccinators could give ineffectively vaccinated individuals a false sense of security. He imagines a farmer who, having heard of cowpox's protective properties, notifies a local surgeon when something resembling cowpox appears on his farm. The surgeon, also eager to tap into the prophylactic qualities of cowpox, makes an experiment by taking away disease material from the cow to inoculate his patients. If he effectively produces a sore and invokes some systemic reaction, Jenner argues, the "fallacious idea of security both in the mind of the inoculator and the patient may arise" (*Further Observations* 5). In the effort to prevent this unfortunate, if understandable, error, in 1799, Jenner attempted to overcome the deficiencies of the *Inquiry* with his *Further Observations on the Variolae Vaccinae*, which provides a more detailed description of how to discern that a particular ailment is in fact cowpox and when to extract disease material from it. Hopeful that this supplemental description would help alleviate some of the controversy surrounding the efficacy of vaccines, Jenner warned that repeated diagnostic errors would likely prevail until cowpox became more generally understood.⁷⁵

⁷⁵ Jenner's dismissive response to counterevidence of his claim to be able to offer perfect protection was echoed in subsequent efforts to corroborate his findings. Among the first to review Jenner's pamphlet was George Pearson, a chemist well versed in the importance of experiments and trials.

More than two hundred years later, it is difficult to evaluate the reasons for documented failures of vaccination to protect against smallpox, that is, to assess whether such counterevidence was the result of individual incompetence or the inherent limitations of the technique, even when it was properly administered. What is not controversial, however, is that, regardless of the reasons, vaccines failed to provide the lifelong immunity that Jenner and other early supporters of this technique had expected. History has shown that a large percentage of those who received the vaccine were either not fully immunized or, in many instances, definitely needed to be revaccinated. As a result, confidence in vaccination was gradually shaken by the realization that one vaccination was not sufficient to provide protection. Validating Jenner's concerns about the false assurance that people might acquire when inoculation proved to be ineffective, the fact that vaccination did not always convey lifelong immunity was only ever brought to light when many who

Pearson expressed concerns about the small number of case histories that Jenner included and, more importantly, that only Jenner's experiences had been reported (Rusnock, "Medical Statistics," 341). To address this limitation, Pearson turned to correspondence, as Jurin had done eighty years earlier. Similarly, whenever he encountered reports of individuals succumbing to smallpox after having had cowpox (whether through natural infection or inoculation), he simply discredited the testimony. He cites, for example, "an intelligent and respectable Inoculator in this country" who reported that, of several hundred people that the latter had inoculated with smallpox, who had previously had cowpox, very few caught the infection. The inoculator reported that he had good reason to believe that those who had fallen ill had been deceived about having had cowpox in the first place (8-9). And when a surgeon of Buckingham recollects cases of boys having had smallpox after having had cowpox, Pearson accounts for this counterexample by concluding that "[t]he disease is not very notorious, for I passed some days last week with two intelligent farmers, one of them had kept 70 milch Cows for many years pass, but knew nothing of the Cow Pox among his servants. The other knew as little" (13). Accepting Pearson's incredulous interpretation of these and similar testimonies, Jenner concluded that Pearson's report "contains not a single case which I think we can be called an exception to the fact I was so firmly impressed with—that the Cow Pox protects the human body from the Small Pox" (*Further Observations* 2).

thought they were protected suddenly discovered that they were coming down with the disease. The fact that they had assumed the risks of vaccination had not protected them from the further risks of infection. As some critics note, in some cases, susceptibility was simply delayed to a later stage of life, when the risks of complication were greater than they likely would have been in childhood. Reinforcing Beck's warnings about the incalculability of technology-generated risks, the rationalization of risks that helped legitimize prophylactic intervention was wholly ill-equipped to integrate the failing of technology into its analyses, let alone anticipate its far-reaching consequences. And so, although the calculation of risks was first employed in the effort to divest the natural world of its uncertainty, it inadvertently introduced new risks, risks of hitherto unthinkable magnitude.

Chapter Four: The Burden of Risk and the Burden of Proof

The uncertain and incalculable risks surrounding the decision to vaccinate are particularly problematic when we consider that the weight of such risks, as of the risks of natural infection, is usually primarily borne by certain segments of the population: young children in the case of routine vaccinations, and various other demographics in the case of epidemics. Early risk analysts were confident that calculating the numerical advantages of inoculation had revealed the procedure to be favorable for individuals and the population alike. But as we will see, insofar as the community's interest in reducing overall disease mortality rates can be in tension with the individual's endeavour to withstand his encounter with disease, the attempt to unite individual and community interests through rational risk reduction ultimately backfires.

In *Security, Territory, Population*, Foucault highlights this difficulty with inoculation by comparing the logic of the medical procedure to the logic of a free-market society, both of which he associates with a laissez-faire approach to governance.⁷⁶ He points out that there are important resemblances between the prophylactic treatment of smallpox with injected disease material and the economic approach to scarcity that attempts to “find a point of support in the processes of scarcity themselves” (87) rather than avoid scarcity altogether. In contrast with the former juridical-disciplinary regulations

⁷⁶ Throughout this chapter, all citations of Foucault's work are, unless indicated otherwise, from *Security, Territory, Population*.

representative of mercantilism, which strove to mitigate scarcity and high prices with a series of prohibitions and constraints—no hoarding, no exporting, etc.—Foucault traces the historical transition, in the middle of the eighteenth century, to a more “liberal” approach to the “natural” fluctuations of scarcity and abundance. From the latter perspective, scarcity was no longer viewed as an evil to be avoided at all costs, but rather a natural phenomenon that should be incorporated into the economic system, allowed and, at certain times, even encouraged (59). Scarcity became something that could be effectively dealt with via a series of other economic mechanisms that gradually corrected, compensated for, checked, and finally nullified it (62). Similarly, rather than attempt to contain the spread of communicable diseases by treating infected persons and preventing their contact with others—approaches characteristic of the older, juridical-disciplinary, approach (90)—inoculation promised to prevent disease by mimicking its circulation in society, albeit in an artificial manner. As Foucault observes, what was most remarkable with variolization,⁷⁷ and more especially with variolization than with vaccination, is that it did not try to prevent smallpox so much as provoke it in inoculated individuals, but under conditions such that nullification of the disease could take place at the same time as this [inoculation], which thus did not result in a total and

⁷⁷ In Graham Burchell's translation of *Security, Territory, Population*, he translates the French 'la variolisation' into 'variolization.' Both refer to the medical inoculation of smallpox, variolation.

complete disease (87-8).

And so, with quantitative methods of analysis to monitor and adjust as appropriate the “natural” ebbs and flows that occur within a living population, government leaders were no longer compelled to avoid the “evils” of disease and scarcity, but could rather fold them into a well-functioning society. It was primarily this feature of immunization, this paradoxical promise of avoidance through non-avoidance, Foucault argues, that “made these new techniques [of variolation and vaccination] acceptable, if not for medical thought, at least for doctors, administrators, those responsible for the medical police, and finally for the people themselves” (88).

The concrete way in which the logic of immunization opened up a gap between the individual and the population is brought to the fore in Foucault’s critical examination of the liberal promise that in a “free market,” there are no massive food shortages. When the condition of scarcity is allowed to develop, laissez-faire theories of economics assure us, its reality necessitates its self-regulation. But, Foucault is careful to note, this does not mean that the problem of hunger is thereby abolished. On the contrary, scarcity is a necessary part of the functioning economic system—a necessary evil. In order to prevent widespread scourges, he reasons, there must be “some scarcity, some dearness, some difficulty in buying wheat, and consequently some hunger, and it may well be that some people die of hunger after all” (64). Observing that by letting these people die of hunger it becomes possible to

prevent scarcity from occurring in the massive form of scourge typical of previous systems, Foucault reminds us that such a reality is possible only insofar as the population, on the one hand, and the multiplicity of individuals, on the other, remain at odds. In the case of economics, it is an antagonism inherent in the scarcity event: at the level of the population it all but disappears, but the scarcity that causes the death of individuals not only does not disappear, it must not disappear (64). Herein lies the paradox. Similarly, in the case of smallpox, Foucault is clear that the introduction of inoculation did not eradicate the reality of disease or death, but rather removed our consideration of its seeming inevitability to the level of the population, where it could better be normalized and rationalized. The weight of concern, at least with regard to variolation—the risks of dying from inoculation versus from smallpox (88)—undoubtedly still fell on the individual. But by submitting the question to the calculus of probabilities, it became possible to approach the decision on an entirely new scale.

Case, Risk, Danger, and Crisis

The conflict of interests between the individual and the population—a conflict seen also in free-market economics—is further complicated, in the case of smallpox inoculation, by the systematic distribution of risks across the population. In view of smallpox's preferential infection of certain demographics, its prevention was thought to be more effective to the extent

that preventative strategies mirrored the patterns of infection. As Foucault observes, in contrast with seventeenth- and eighteenth-century medicine's description of disease as substantial, "united with a country, a town, a climate, a group of people, a region, a way of life" (88), in the quantitative analyses made of smallpox, disease begins to appear as a distribution of cases in a population circumscribed in time or space. That is, when disease is handled in terms of the calculus of possibilities, the notion of a "case" emerges, which "is not the individual case, but a way of collectivizing the phenomena, integrating individual phenomena within a collective field" (88). In this sense, immunization provides a vivid example of biopower's method of dividing up the multiplicity of people into manageable parts. As Beck describes it, "risks open the opportunity to document statistically the consequences that were at first always personalized and shifted onto individuals. In this way risk de-individualizes. Risks are revealed as systemic events, which are accordingly in need of a general regulation" (*World Risk Society* 51).

When disease becomes accessible in this way, Foucault reasons, it becomes possible to identify the "risk" for each and every body: "For each individual, given his age and where he lives, and for each age group, town, or profession, we will be able to determine the risk of morbidity and the risk of mortality" (89). Such calculations, he continues, imply that risks are not the same for all individuals, nor for all ages, nor in every condition or place—and thereby enable the identification of dangerous elements within a population.

Yet rather than consider susceptibility in terms of a unique encounter between an organism and its external environment, risk analysis reduces it to a function of demographics. Regarding the risk of smallpox, for example, it is considered dangerous to be younger than three years old and more dangerous to live in the town than in the country (89). Finally, Foucault argues, the notions of case, risk, and danger all pertain to the phenomenon of “crisis,” the “sudden, circular bolting [of a disease] that can only be checked either by a higher, natural mechanism, or by an artificial mechanism” (90). The state of crisis is ultimately what gives the calculations of case, risk, and danger an added sense of urgency.

Demonstrating the enduring presence of the power mechanisms Foucault identifies with the historical administration of variolation and vaccination, during the H1N1 pandemic of 2009, what public health authorities deemed to be most concerning was not the actual presence of the disease in certain countries or climates, but rather the identification of a probable case—of *who*, or rather, which demographic, was considered to be most at risk of contracting the virus during a time of crisis. When Dr. Margaret Chan, the Director General of the World Health Organization (WHO), raised the level of the influenza pandemic alert from Phase 5 to Phase 6, she identified pregnant women as being at an increased risk of experiencing complications from the virus, stressing that this heightened risk was especially threatening with a strain, like H1N1, that infects younger age groups preferentially: “around one

third to half of the severe and fatal infections are occurring in previously healthy young and middle-aged people.” Chan noted that this pattern of infection is significantly different from that seen during epidemics of seasonal influenza, when most deaths occur in frail elderly people. For this reason, she was especially concerned about how the virus would behave under conditions typically found in the developing world, where more than ninety-nine percent of maternal deaths occur. When smallpox was present, Foucault writes, it was dangerous to be younger than three years old (61). With H1N1, it was dangerous to be young and pregnant. In both cases we find that the notion of case introduces a break in the domain of life under biopower’s control; it stratifies the biological continuum and provides a basis for prioritizing those deemed most in need of treatment. Moreover, such demographically-targeted medical interventions are often made during times of *crisis*, which, in the words of Chan, “creates a demand for advice and reassurance in the midst of limited data and considerable scientific uncertainty.”

As Foucault outlines it, the elements of case, risk, danger, and crisis invoked in the widespread use of inoculation defined individuals in a way that was completely distinct from the approaches used in previous medical practices. In contrast with the disciplinary system applied to endemic diseases like leprosy—a system that involved treating the disease in each patient insofar as the latter could be cured, and then preventing contagion by isolating the sick from the healthy—the apparatus that appears with variolation and

vaccination does not impose a division between those who are sick and those who are not. Rather, it approaches all who are sick and all who are not sick as a whole, that is to say, it approaches the population in its entirety, and identifies the coefficient of probable morbidity or probable mortality within this population. In the eighteenth century, for example, the rate of mortality from smallpox in certain regions was 1 in 7,782. Foucault argues that, after establishing the idea of “normal” morbidity or mortality for the entire population, a finer analysis could be made to distinguish different normalities in relation to each other—that is, the “normal” distribution of cases of and deaths due to smallpox for every age, region, town, and type of occupation. With this demographic information, public health policies can then attempt to minimize the most unfavorable, deviant normalities in relation to the normal, general curve—that is, to bring them more into alignment with the overall norm. For example, the discovery that children under three years old are affected by smallpox much more rapidly, easily, and strongly than other age groups would inform the attempt to improve these subgroup morbidity and mortality rates to align them better with the average levels of morbidity and mortality of the population—averages affected in turn by the now lower morbidity and mortality rates of the affected segment (91).

In the effort to lower the morbidity and mortality rates of infectious disease, it certainly makes sense to target special population groups that are most “at risk.” It is also clear that this approach is advantageous at the levels

of the individual and the population alike. By providing preferential treatment to those most in need of it, it is possible to help the greatest number of people and have the largest impact on interrupting the spread of infection. And yet, this rationalization of probabilities takes on a radically different tenor when we bring the associated risks of a prophylactic procedure, known and unknown, to the fore, and consider how a particular segment of the population, specifically targeted in the hope of slowing and stopping the train of disease transmission, must bear the burden of the consequences of such medical intervention. As Beck observes, a risk society deals first and foremost not with the distribution of 'goods' but with the allocation of 'bads' (*World Risk Society*, 63).

By “collectivizing the phenomena,” considerations of case, risk, danger, and crisis rupture the domain of life that is under power's control, creating caesuras within the biological continuum, namely cases. And in the face of disease, not all cases are equal. Foucault identifies racism as the mechanism that typically fragments the biological continuum in biopolitical societies. That is, he introduces the concept of racism to account for how the power of death can be exercised in a political system centered on preserving life. Identifying biopower with societies that promote life by normalizing their members, in *Abnormal* he argues that, within such a system of power, “racism is the indispensable precondition that allows someone to be killed, that allows others to be killed. Once the State functions in the biopower mode, racism alone can justify the murderous function of the State” (256). Racism, in short, is what

introduces the break between what must live and what must die (254-55), replacing the old sovereign right over life. But in order to interrupt the biological continuum, racism need not target ethnicities deemed to be inferior. In fact, Foucault is careful to distinguish this traditional form of ethnic racism from the kind of “internal racism” operative in the context of biopolitics, which, he argues, “is not so much the prejudice or defense of one group against another as the detection of all those within a group who may be the carriers of a danger to it. It is an internal racism that permits the screening of every individual within a given society” (316-17).⁷⁸ As Foucault presents it, racism is what “allows the biopolitical state to designate certain populations or segments of its own population as threatening, and thus to warrant that population's endangerment in the name of the protection and management of life” (Taylor 753). From this perspective, although targeting groups at increased risk of infection does not, in itself, advance a racist agenda, it does provide justification for stratifying society in terms of the danger that certain groups present to the whole. After all, identifying a special group as being more at risk of contracting an infectious disease—and, in turn, more at risk of infecting the rest of the population—provides a way of determining not only who is most in need of treatment, but also who should assume the burdens of prophylactic treatment in order to stop the train of transmission for the benefit of the whole.

⁷⁸ This “internal racism” dispenses with race by identifying non-racial abnormalities (such as deviant sexuality or abnormal cognitive and physical abilities) as a threat to be eliminated insofar as passing on deviant genes is considered to undermine the future of the race (Taylor 749).

This potential for therapeutic discrimination was highlighted by the Swiss mathematician Daniel Bernoulli (1700-82) in 1760, when he applied statistical analysis to the question of variolation even more rigorously than Jurin did in the latter's mortality tables. A wholehearted supporter of immunization, Bernoulli endeavored to develop a mathematical formula to display the numerical advantages that successful, universal inoculation would confer both on the individual and the community (Bradley 8)—and to thereby influence public health policy (Blower 275). He was adamant that “in a matter which so closely concerns the wellbeing of the human race, no decision shall be made without all the knowledge which a little analysis and calculation can provide” (277).

Bernoulli defends his case by finding the numerical gain in life expectancy that would be achieved if smallpox no longer existed or, what would amount to the same thing, if nobody died of it. In other words, he assumed that universal variolation could effectively eradicate the disease, and then calculated the numerical advantage that a world free from the scourges of smallpox would have over a world in which the disease was still rampant. His calculations indicate that, in contrast with only 565 out of 1300 newborns who reached the age of 25 in the eighteenth century, when smallpox was endemic, 644 would survive if smallpox was eliminated. He is quite confident that if variolation brought all the advantages that “accompany the state of freedom from smallpox” without any disadvantages, the decision in favour of

inoculation would be the obvious one. It is only ever the risks attributed to inoculation, he adds, that keep us undecided (284).

Bernoulli's reflections prompted him to examine a new question, namely, what would be the state of the human race if, at the price of a certain number of victims, we could procure for it freedom from natural smallpox? Admitting that this problem, at least at first, appears to be difficult, he, I think accurately, insists that it in fact "flows quite naturally from our principles and our way of treating the subject" (284). Accordingly, after factoring the risks associated with inoculation into his calculation, Bernoulli concludes that the number of infants lost to inoculation is negligible for the whole population, "which alone merits the attention of the Prince when the wellbeing of the State or the public as a whole is concerned" (284). From this perspective, he considers it a moral certainty that, so long as inoculation administered to infants kills no more than 100 out of 943, it would be a benefit to society. Any potential losses would solely involve children useless to the State, and gains would affect those within an age group that is most precious (284-85).

A paradigmatic example of the mechanisms of security that functioned to integrate immunization into modern society, Bernoulli's report reinforces the basic principle inherent in *laissez-faire* economics, namely that, in order to improve the life of the population, the sacrifice of certain individuals is not only forgivable, but necessary. Yet, unlike the stratification present in capitalistic society, which systematically disadvantages the poor (and all other groups

insofar as they are more likely to be poor), the mechanisms of security at play in the distribution of acquired immunity have the additional capacity to draw other lines of differences in the biological continuum—babies, children, and pregnant women, for example, are often singled out in public health campaigns regardless of economic status.

What happens when our efforts to protect the population at large impose increased risks on a particular segment of the population? Such a concern, I contend, need not assume that contemporary government leaders would willingly sacrifice members of the population for the benefit of the whole. While the mercantilist ideology that informed Bernoulli's conclusions is no longer in vogue, his numerical methods of analysis are still well regarded and, irrespective of the political ideology with which they are employed, are bound by the same inherent methodological constraints. Indeed, all that is needed for the mechanisms of security to take on a more negative tonality is a lack of knowledge, an almost inevitable consequence of acting "in the midst of limited data and considerable scientific uncertainty" (Chan). When an unknown risk is entered into the calculus of probabilities as "no risk"—the otherwise benign notions of case, risk, danger, and crisis can transform an altruistic public health enterprise into a widespread medical experiment,⁷⁹ one in which it is precisely those identified as being most in need of treatment who absorb the

⁷⁹ By extension, when members of the population are targeted with a vaccine that has not been (adequately) tested for safety or efficacy, I find it appropriate to invoke the principles of the Nuremberg Code, a set of ethical guidelines that forbids experimentation on human subjects without free and informed consent.

greatest risks.

Priority Treatment for Pregnant Women

This vulnerability was brought to public attention during the swine flu pandemic, when pregnant women were isolated as a special population group, particularly at risk of complications from infection. On the one hand, since they were identified as particularly susceptible to complications associated with the swine flu virus, they were especially encouraged to be vaccinated; on the other hand, there were concerns expressed that such recommendations could not be supported by a risk-benefit analysis: at the time the risks of vaccinating pregnant women with adjuvanted vaccines were completely unknown.

Once the swine flu vaccine was introduced at the end of September 2009, mechanisms of security functioned with rapid precision to distribute the vaccine to the populations “most at risk.” In early October, United Nations health officials urged rich countries to make more vaccines available to poorer nations, who are understood to be at greater risk because of their high rates of maternal deaths. The United States, Brazil, and France agreed to make ten percent of their national vaccine stockpile available to developing countries, and manufacturers donated approximately 150 million doses of vaccines (Rabinovitch). On 10 November 2009, GlaxoSmithKline announced its agreement with the WHO to donate 50 million doses of its adjuvanted

pandemic H1N1 vaccine to the WHO for distribution to developing countries most in need (“GSK Signs Agreement”).

This gesture of global solidarity was made six weeks after the French national nurses’ union published a press release stating that sixty-five percent of nurses planned to refuse the swine flu vaccine over safety concerns, a concern that prompted the Health Minister of France to drop plans to give vaccines with adjuvants to pregnant women (“Vaccinations Dont Grippe H1N1”). These developments followed less than a week after Prime Minister Ewa Kopacz delivered her speech to the Polish Parliament stating that she would not authorize any vaccines because they had not yet been adequately tested for safety.⁸⁰

In contrast with these more conservative reactions, in Canada, the government made use of Section 30.1 of the Food and Drugs Act, which gives the Minister of Health the authority to fast-track a drug “to deal with significant risk, direct or indirect, to human health, public safety, or the environment” (“Road to Rollout”). As written by GlaxoSmithKline on the product information leaflet for Arepanrix H1N1-AS03-Adjuvanted H1N1 Pandemic Influenza Vaccine:

Health Canada has authorized the sale of the

Arepanrix H1N1 based on limited clinical testing in

⁸⁰ Kopacz also considered the conditions offered by the pharmaceutical companies for the purchase of the vaccines to be unacceptable. The government was asked to take full responsibility for all undesirable side effects and the vaccines were offered at up to two to three times the price of vaccines used against seasonal influenza (Flynn 17).

humans under the provision of an Interim Order (IO) issued on October 13, 2009. The authorization is based on the Health Canada review of the available data on quality, safety and immunogenicity, and given the current pandemic threat and its risk to human health, Health Canada considers that the benefit/risk profile of the Arepanrix H1N1 vaccine is favourable for active immunization against the H1N1 2009 pandemic H1N1 influenza strain (25).

The declaration of a pandemic allowed the Health Minister to authorize the vaccine on “limited clinical testing.” Pregnant women were especially encouraged to receive it even though, in contrast with the limited data of other populations, absolutely “no data has been generated in pregnant women with Arepanrix H1N1 nor with the prototype AS03 adjuvanted H5N1 vaccine” (8). In the absence of information, GlaxoSmithKline advised consumers that considerations should be taken of any recommendations made by the Public Health Agency of Canada, (5) and “the agency sa[id] the vaccine with the adjuvant is safe for pregnant women” (“Road to Rollout”). And so, the risk analysis for the pertinent population was made in the absence of any data. The decision was made preemptively that, no matter what the risks of vaccination may have been, the risks of infection were greater.

A comparison is instructive: in the absence of a pandemic, when

GlaxoSmithKline is held to higher safety standards, it explicitly acknowledges that, since the safety and effectiveness of a seasonal flu vaccine with adjuvant “have not been established in pregnant women or nursing mothers,” (*Fluratrix* 20) pregnant women have to be informed accordingly. They stipulate that all women who receive the vaccine while pregnant should be registered with GlaxoSmithKline’s pregnancy registry. That is, if, and only if, it is considered absolutely necessary that the vaccine be administered to them. After all, the manufacturers at GlaxoSmithKline reason that since there are “no adequate and well-controlled studies in pregnant women,” (*Fluratrix* 12) the vaccine should be given to a pregnant woman “only if clearly needed” (*Fluratrix* 12). When the world was no longer in a state of alarm, during the 2011 flu season, GlaxoSmithKline acknowledged that “although excess morbidity and mortality were observed among pregnant women during the pandemic outbreaks in 1918-19 and 1957-58, further studies are needed to determine whether pregnancy per se is a risk factor that warrants routine influenza immunization” (*Fluviral* 5). But in a state of emergency, “pregnant women who don't get the H1N1 vaccine are at the highest risk of becoming sick and infecting their fetuses” (“Pregnant Women Urged”); the vaccine was considered “the best solution because it offers an almost perfect protection” (“Pregnant Women Urged”).

As a token precautionary measure, in the early days of the declared pandemic, Health Canada ordered just under two million doses of the vaccine

without the adjuvant (“Road to Rollout”). Within a few short months, however, this concern was considered negligible compared with the danger of being infected that pregnant women faced. In December 2009, public health experts in Montreal urged pregnant women in particular to get the H1N1 vaccine, since they are at the highest risk of becoming sick and infecting their fetuses: “It’s the only way to protect your little baby” (“Pregnant Women Urged”). Dr. Richard Lessard, from Montreal’s Public Health Agency, acknowledged that there was “some confusion in the early days of the vaccine campaign,” but assured the public that “it’s now clear that with or without the adjuvant—an additive that boosts the immune system’s response to a vaccine—the vaccine isn’t dangerous for pregnant women” (“Pregnant Women Urged”). Once again, it is not clear on what basis Lessard discerns that with or without the adjuvant the vaccine is safe for pregnant women. But it is clear that there is a difference between an adjuvanted vaccine and a monovalent vaccine, namely the adjuvant, that is, materials such as aluminum, squalene, and Polysorbate 80 added to the vaccine to accelerate or enhance antigen-specific responses.

In the months following the swine flu pandemic, the fact that the H1N1 campaign had targeted pregnant women prompted researcher Carla Herberts and her colleagues from the Centre for Biological Medicines and Medical Technology in the Netherlands to consider the safety of adjuvanted vaccines in this special population. What they found was a startling dearth of information. More specifically, after a survey of the literature, they reported

that “the safety of adjuvanted vaccines in pregnant women has not been tested in clinical trials” (1421) and that “the potential effects on pregnancy of interfering with this uniquely adapted immune balance through the induction of proinflammatory reactions as those induced by adjuvanted vaccines have only been studied rarely” (1411). As Esposito notes in his exploration of the unique immune reaction present in the mother during pregnancy, changes in the maternal immune system are essential for acceptance of the fetus and for development of the placenta, and interference with this immune response may interfere with normal pregnancy. For this reason, Herberts and her colleagues stress that it is impossible to extrapolate vaccine safety data from nonpregnant populations to the pregnant population: proinflammatory stimuli that are present in vaccines, in particular in adjuvanted vaccines, may induce a stronger immune response in pregnant individuals, since pregnant individuals have been shown to be more sensitive to proinflammatory stimuli than nonpregnant women. In theory, they explain, a strong activation of the maternal immune system during this period, such as that induced by an adjuvanted vaccine, could negatively impact the implantation of the embryo and acceptance of the fetus (1421). Herberts et al. conclude that a risk-benefit evaluation of administering adjuvanted vaccines to pregnant women is extremely difficult insofar as the risks remain unestablished. Acknowledging that, despite this limitation, several governmental organizations decided to administer adjuvanted vaccines to pregnant women, they maintain their

position that “immunization with adjuvanted vaccines during pregnancy is best avoided” (1421). They insist that more data is needed to determine whether the benefits of the use of these vaccines and their adjuvants outweigh the risks of developing potentially severe pregnancy complications, such as preeclampsia or even abortion (1417).

The Clarity of Hindsight

In the months following the declared pandemic, researchers challenged not only the safety of the vaccine but also the necessity of taking such an extreme preventative measure, regardless of its specific risk profile for special populations. Despite early fears about the virulence of H1N1, the virus failed to become the severe global threat that it was predicted to become, opening the WHO's response to the threat to vast criticism. In fact, the common focal point uniting all arguments presented by critics was the disparity between the relatively mild unfolding of the virus when it first appeared in the autumn of 2009, and the far-reaching prophylactic action taken to prevent its spread (Flynn 8). Particularly salient in its criticism, the Council of Europe, who were subject to the WHO's management decisions, denounced the WHO's reliance on vaccination to deal with the threat of infection. Reinforcing Beck's observation that in risk conflicts, “the central question of power is . . . the question of who, with what legal and intellectual resources, gets to decide what counts as a 'risk'” (“Interview” 100), one of the central points of criticism

expressed by the Council was the WHO's definition of "Pandemic Phase 6." While the declaration of this pandemic phase initiated an immediate international agenda to implement mass vaccination strategies, critical voices noted the glaring omission of the disease's severity as a criterion for promoting the influenza pandemic to the highest alert level (Grolle and Hackenbroch). In other words, "the pandemic could be declared without the need to show that it was likely to be severe in terms of its impact on the population (for example regarding severity of illness and death)," (Flynn 9) even though establishing the urgent need for vaccination was to be based on the expected severity of the disease's impact on individuals who contracted it, as was the legal authority to bypass standard safety procedures for testing vaccines before introducing them to the general population. As members of the International Health Regulations (IHR) review committee summarized in their evaluation of the criticisms leveled against the WHO, "Even if the definition of a pandemic depends exclusively on spread, its degree of severity affects policy choices, personal decisions and the public interest" (15).

After the WHO declared the pandemic to be at Level 6 at a time when the influenza was presenting relatively mild symptoms, a number of critics honed in on the fact that the WHO had changed the definition of pandemic levels just before announcing that H1N1 had reached the sixth level. On 26 January 2010, Dr. Wolfgang Wodarg, German epidemiologist and former member of the Parliamentary Assembly, argued that the declaration that the

swine flu had reached Pandemic Phase 6 had been possible only because the threshold for declaring a pandemic had been lowered. In response, the WHO maintained that the basic definition of a pandemic was never changed, and that any observed changes were the result of improving the phrasing so as not to scaremonger unnecessarily (Flynn 9). The European Council argued that regardless of the WHO's intentions in modifying the pandemic definition in a way that allowed for an accelerated announcement of such an event, doing so in a non-transparent way at a time when a major influenza infection was already underway raised doubts concerning undue influence on decision-makers. Paul Flynn, as rapporteur of the committee, observes that the outcomes of declaring a pandemic prematurely were dramatic:

distortion of priorities of public health services all over Europe, waste of huge sums of public money, provocation of unjustified fear amongst Europeans, creation of health risks through vaccines and medications which might not have been sufficiently tested before being authorised in fast-track procedures, are all examples of these outcomes (17).

In view of the far-reaching consequences of the WHO-organized global response to H1N1, Flynn suggests that, going forward, all stakeholders should work in-depth to agree on a common definition and description of what an influenza pandemic is and that “this should become the central element of

clear international guidelines for national pandemic preparedness planning” (10).

While the European Committee's call for increased transparency was driven by suspicions that the WHO may have been unduly influenced by financial interests, the IHR review committee found “no evidence of malfeasance” (11). More specifically, although the committee acknowledged that the WHO's lack of transparency was ill-advised⁸¹ and understandably gave rise to suspicions from certain state members, it “found no evidence of attempted or actual influence by commercial interests on advice given to or decisions made by WHO” (17). Furthermore, the committee members were critical of accusations that invisible commercial interests influenced the WHO's actions, condemning it as an affront to the core public-health ethos to prevent disease and avert avoidable deaths (17). It was not commercial interests that prompted the WHO to take preemptive action, the committee was confident, but rather the conviction common to all public health officials that “in the face of uncertainty and potentially serious harm, it is better to err on the side of safety” (10). The committee unfortunately did not address how this core value should be reconciled with the possibility that the prophylactic strategies themselves introduced an unknown element of risk. It is, for example, difficult to err on the side of safety when the safety profile of certain vaccines in certain demographics is entirely unknown.

⁸¹ The IHR committee found that the WHO lacked “a sufficiently robust, systematic and open set of procedures for disclosing, recognizing and managing conflicts of interest among expert advisers” (16).

In response to accusations that the WHO vastly overstated the seriousness of the pandemic, the committee reminded critics that reasonable criticism can be based only on what was known at the time that the decisions were made and not on what was learned later. As Giddens observes, “We just cannot know beforehand when we are actually 'scaremongering' and when we are not” (*Conversations* 212). And the committee found that the degree of severity of the pandemic was very uncertain throughout the middle months of 2009, when countries would have needed to place orders for the vaccine. Dispelling allegations of misconduct, the committee deemed the discrepancy between the WHO's intervention and the severity of the pandemic to have been the inevitable—if unfortunate—result that arises when you match the public health mandate to favor action over inaction with the sobering fact that a “lack of certainty is an inescapable reality when it comes to influenza” (10).

Providing additional insight into the course of action chosen by the WHO, Sudeepa Abeysinghe offers a simple, though no less profound, explanation: the WHO's heavy reliance on vaccines during the swine flu pandemic reflected a well-worn institutional process in disease management (382-2). Although the WHO acknowledged other possible responses to the influenza pandemic, such as isolation and quarantine, anti-virals, and sanitary measures, it allocated such measures as secondary to the vaccines, which were emphasized as the best (and only real) strategy (390). Like the external committee reviewing the WHO's actions, Abeysinghe is critical of accusations

that the WHO's almost exclusive attention to vaccines reflected the economic interests of pharmaceutical industries, insisting that the WHO would not have benefited from a false scare, since this would have, and indeed has, undermined the organization's long-term credibility. Furthermore, she argues, other measures such as anti-virals would have been equally profitable (385). She finds that a "path dependency" analysis more convincingly explains the WHO's preference for vaccines, that is, the tendency for well-established institutional processes to be pivotal in decision-making processes, especially in the face of risk and scientific uncertainty. In short, she argues that the WHO did what it did in the face of uncertainty, namely manufacture and distribute vaccines, because that is what it has always done.

In line with the WHO's own self-assessment, Abeysinghe identifies its campaign to eradicate smallpox as the prototypical example of the organization's success in controlling infectious disease (387) and argues that this precedent has provided the perspective through which it has managed subsequent cases. More specifically, she details how following this early success story, vaccination became the WHO's dominant strategy in controlling infectious disease (387). Although the WHO often references the *successes* of its past mass vaccination campaigns when justifying its continued reliance on vaccination to eradicate other infectious agents, Abeysinghe argues that, in fact, the prominent *failures* of these campaigns lies, at least in part, in the

WHO's dependency on vaccination as a resource against communicable disease.

The European Council also highlighted the WHO's path-dependent behaviour in addressing the swine flu threat by criticizing its reliance on vaccination over strategies that have a better established record of being effective. Inviting Tom Jefferson from the Cochrane Reviews to attend their public hearings, the European Council cited his co-authored finding, after reviewing more than 40 clinical trials, that “the performance of the vaccines in healthy adults is nothing to get excited about” (11). More specifically, Jefferson concluded that on average, perhaps 1 adult out of 100 vaccinated will get influenza symptoms compared to 2 out of 100 in the unvaccinated group. Even more relevant to the H1N1 vaccine campaign, where certain high-risk groups, such as pregnant women, were encouraged to be vaccinated because they were particularly vulnerable to complications, the review found no credible evidence that vaccines have any effect against complications associated with influenza, such as pneumonia or death (11).⁸² Further challenging the WHO's heavy emphasis on vaccinations, Jefferson notes that in contrast with the inconsistent record of vaccinations to effectively treat the flu, “public health interventions such as hygiene measures and barriers have a much better evidence than vaccines” (12). In view of the financial and infrastructural demands of a mass vaccination strategy, he considers them to

⁸² He also reasoned that even if vaccines were one hundred percent effective, they could only affect between seven and fifteen percent of the annual flu burden, since this is the proportion of people with an influenza-like illness (“flu”) who truly have influenza (2).

be a better alternative to vaccination because they are “cheaper and socially acceptable, as well as being life savers in poor countries” (12).

Without suspecting that the WHO had ulterior motives for relying almost exclusively on vaccination during the H1N1 “pandemic,” the IHR external committee echoed Jefferson's concern that the organization’s emphasis on vaccination over hygiene undermines its capacity to meet the threats posed by contagious disease. More specifically, its overall conclusion of the WHO's performance during the swine flu pandemic was that “the world is ill-prepared to respond to a severe influenza pandemic or to any similarly global, sustained and threatening public-health emergency” (12) and it attributed this lack of preparation above all to the WHO's over-investment in a technology ill equipped to handle a severe pandemic, namely vaccines:

The world's capacity to prevent and limit a severe pandemic is constrained by many factors:
predominant reliance on vaccine production
technology that is little changed in 60 years; the need
to match vaccine to particular viral strains; the inability
to predict which influenza viruses will be dangerous to
human health; uncertainty about the effectiveness of
many pharmaceutical and public-health measures;
the lack of field-based, rapid, affordable, highly
sensitive and specific diagnostic tests; and limitations

of infrastructure, resources and capacities in many countries (22).

In view of the inherent limitations of a mass vaccination campaign to effectively address a widespread pandemic, like Jefferson, the external committee suggested that the WHO invest more in hygienic preventative strategies: “Also needed are improved knowledge of and practical strategies for implementing public-health and personal protective measures, such as handwashing, respiratory etiquette, isolation and social distancing” (22).

As this case study from 2009 vividly illustrates, while it is arguably outdated to think, along with Bernoulli, that government leaders might knowingly expose a particular segment of the population to undue risk, in view of all of the unknown variables at play in global pandemics, it is perfectly reasonable to expect that they might unknowingly do so.⁸³ During the H1N1

⁸³ It is in view of this very real possibility that Dr. Bernadine Healy, former head of the National Institutes of Health, criticizes the public health establishment for being too quick to dismiss vaccine concerns as irrational. As David Kirby reports in his article, “Dr. Bernadine Healy: Don't Dismiss Vaccine Link,” Healy insists: “The more you delve into it, if you look at the basic science, if you look at the research that's been done in animals, if you look at some of these individual cases, and if you look at the evidence . . . what you come away with is that the question [of vaccine safety] has not been answered.” She accordingly denounces public health officials for dismissing the hypothesis that vaccinations might contribute to autism without having studied the population who “got autistic symptoms within a period of a few weeks of the vaccines.” She insists that large population studies are not enough to disprove a link and that resources are available to design more focused studies to help establish “whether or not there are susceptible children . . . [children] more susceptible to vaccines, plural, or to one particular vaccine, or to a component of vaccines, like mercury.” Herself a proud member of the Institute of Medicine (IOM), she is nevertheless critical of their mandate deliberately not to pursue susceptible groups out of fear that “if they found them, however big or small they were, that would scare the public away. They don't want to pursue this hypothesis because it could be damaging to the public health community at large.” Dr. Healy's critical assessment not only exposes the ways in which the mandates governing vaccine “science” continue to prioritize the population as a whole over the multiplicity of individuals; it also demonstrates how such an approach to risk analysis privileges ignorance. As long as “no known risks” continue to be evaluated as “no risks,” the particularly vulnerable members of society will continue to be compromised for the benefit of society. See also Solomon.

pandemic, when decisions needed to be made at a time of scientific uncertainty, pregnant women were especially encouraged to assume the unknown risks of vaccination in order to avoid the incalculable risks of the swine flu. Insofar as it targeted pregnant women, this episode provides a particularly vivid demonstration of the way in which the seemingly banal mechanisms of security and path-dependent behaviour operative in the mass distribution of vaccination can function to undermine the productive immunitary features of pregnancy. During the H1N1 pandemic, the notions of case, risk, danger, and crisis were invoked in such a way that the potential for disrupting the delicate immunitary balance necessary for pregnancy, was, at least in some parts of the world, completely overlooked. In a state of crisis, pregnant women were isolated for treatment, pressured to make an important decision in the absence of sufficient information, and given the false assurance that their decision to be vaccinated was the safest of all possible options.

Perhaps more worrisome than reassuring, is the fact that this sort of biopower can discriminately impose risks on a certain segment of the population with absolutely no evidence of malfeasance. I agree with Biss that the mechanisms of vaccine distribution that may inadvertently endanger life are, in most cases, not the result of “researchers and health officials and doctors worldwide [who] would willfully harm children for money” (Biss 102). But recognizing them as nothing more than a function of vaccination's

recourse to risk analysis does not give me reason to rest assured. As Nikolas Rose observes, although the rise of risk analysis as the contemporary paradigm of biopolitics is more mundane than the racist and eugenicist discourses that preceded it, it is by no means less hazardous:

There are technical problems, for example the validity and appropriateness of the factors used to calculate the risk profiles through which individuals are allocated to risk groups, their generalizability to others given national and cultural variations, the effects of changes since the time when the scales were constructed and so forth . . . There are the problems that flow from the fact that, once known to fall within a risk group, the individual may be treated – by others and by themselves – as if they were, now or in the future, certain to be affected in the severest fashion (10).

Adding to this list, I find it particularly disconcerting that, when the singularity of susceptibility to disease is generalized as a phenomenon affecting entire demographics, biopower is well-poised to exercise its capacity to discriminately impose risks on certain fragments of the population. In view of the public health mandate to err on the side of safety, this is a necessary risk that health and state officials must impose on citizens in order to protect them. But when we extend consideration to the alternative method of disease

prevention developed by Hahnemann, which adheres to the medical principle of non-maleficence, it becomes possible to recognize the seeming inevitability of this imposition of risk as a function of a particular, historically-situated medical practice, rather than as a necessary feature of community relations.

Chapter Five: The Romantic Response to the Indeterminacy of Life

While the calculus of probabilities has continued to develop as an integral part of the modern practice of immunization, the extension of mathematical analysis to legitimize the risks of prophylaxis was not always universally accepted. Despite the high rate of morbidity and mortality caused by smallpox, the number of inoculations reported in the German territories remained small compared to those in England (Maehle, "Conflicting Attitudes," 200; Baldwin 250). It is not that the objections raised in Germany against variolation were somehow unique or particularly difficult to overcome, but rather that the numerical legitimization of the technique was not as well received there as it had been in England or even, to a lesser extent, in France.⁸⁴ Although the numerical advantages of inoculation were sometimes cited in German publications on inoculation, they never effectively quieted the local controversy surrounding the procedure.⁸⁵

In order to contextualize the uniqueness of Germany's medical tradition in the eighteenth and nineteenth centuries, it is illuminating to also consider its distinction from England and France in light of its unique philosophical tradition. While Locke's philosophy had a lasting impact on medical practice in

⁸⁴ On France's relatively chilly reception of inoculation and its later use of numerical analyses, see Miller and Cohen.

⁸⁵ One of the most fervent supporters of inoculation in Germany was Juncker, who, after the Halle epidemic in 1791, launched an extensive campaign to eradicate smallpox. In addition to quarantine and hygiene protocols, he strongly emphasized the value of widespread inoculation. One of the most fascinating and unique aspects of Juncker's campaign, in view of similar efforts in England and France, was his request for professors of philosophy to comment on the moral implications of inoculation as such. On the German reception of inoculation, see Maehl, "Conflicting Attitudes" and "Ethics of Prevention."

England and, through the interpretation of Locke's ideas by Condillac, in France, in Germany it was Kant's enlightened philosophy that exerted the greatest influence on the early nineteenth-century medical tradition, spurring physicians and philosophers alike towards an unprecedented intermingling between medicine and philosophy (Flatten 17; Risse, "Kant-Schelling," 146-47; Tsouyopoulos, *Röschlaub*, 47). The central concern was essentially the same in Germany as it was in England and France – namely, to address the question of certainty in medicine and, by extension, to find a basis for establishing medical authority – but the responses to this problematic were incredibly varied, as were their political implications for the medical tradition in general and, in particular, the project of immunizing communities.

Critical Philosophy and the Rise of Medical Skepticism

Medical writings from around 1800 indicate that most medical professionals were extremely dissatisfied with the medical system in Germany and were trying to reform it by establishing a scientific basis for therapeutics. As Tsouyopoulos points out, physicians' lack of scientific authority was inextricably related to their low economic and social status. Since most people preferred to seek treatment from traditional healers and more affordable non-doctors, unless a doctor was fortunate enough to be employed by the state, he could barely earn a living ("Influence" 68). In the effort to secure state recognition for their profession, physicians quickly realized that "it would be

difficult to demand protection against quackery from the authorities if regular medicine itself was not able to distinguish between genuine medical practice on the one hand and blind empiricism and quackery on the other” (“Influence” 68). But how, exactly, could physicians elevate themselves above the swarm of so-called healers? As Guenter Risse rhetorically asks, “If theories were bankrupt, medical practice uncertain and guided largely by shifting impressions, and the nexus between theory and practice questionable, what body of knowledge should be taught to the fledgling professional?” (“Philosophical' Medicine” 75). Without a scientific foundation, physicians were simply ill-equipped to prove their competence as administrators of state-sanctioned public medicine, which demanded “viable definitions of health and disease, proper concepts of nutrition and hygiene, as well as knowledge about the control and prevention of epidemics” (Risse, “Philosophical' Medicine,” 75).

Although physicians' problems were not primarily philosophical, the need to establish an authoritative scientific medicine prompted many to turn to Kant's critical philosophy, which was, at the time, the authoritative reference point for intellectual and social considerations in Germany (Tsouyopoulos, “Influence,” 69). Physicians interested in a systematic revision of medicine's principles were confident that “the new limits posed for human reason by Kantian philosophy facilitated such a task” (Risse, “Philosophical Medicine,” 75). In his *Critique of Pure Reason*, Kant distinguishes *a priori* knowledge,

which is independent of experience and all sensory impressions, from a *posteriori* knowledge, which is empirical, that is, derived from experience (19). Acknowledging that all knowledge is based on experience, Kant qualifies that *a priori* knowledge is not immediately derived from experience, but rather from a general rule, which itself may have been informed by experience. As such, although it may not be independent of this or that kind of experience, it can nevertheless be attained *prior* to experience because it is true of *all* experience (19-20),⁸⁶ providing the kind of certain and necessary knowledge physicians hoped would improve the success rate of their medical interventions. In fact, its defense of the possibility of *a priori* knowledge proved to be one of the most compelling aspects of Kantian epistemology for the medical profession (or, more precisely, for the professionalization of medicine). Yet, as it turned out, the physicians' turn to Kantian epistemology threatened to undermine medical practice as much as it promised to improve it.

After all, Kant was clear that the only concepts that could be used as *a priori* principles are those with a mathematical structure (Tsouyopoulos, "Influence," 70).⁸⁷ He was willing to designate, for example, Newtonian physics, mathematics, and Euclidean geometry as "pure sciences," but maintained that "pseudosciences" such as chemistry and physiology, which

⁸⁶ He gives the example of a man who knows that a house will fall if he removes its supports without having to wait for the experience of it actually falling. Yet, "that bodies are heavy, and, consequently, that they fall when their supports are taken away, must have been known to him previously, by means of experience" (20).

⁸⁷ See also Risse, "Kant-Schelling" and "Philosophical' Medicine."

were derived from empirical *a posteriori* propositions, could be transformed into “pure sciences” only if they were granted *a priori* principles through human reason. The primary question that haunted physicians intent on following Kant's scientific criteria was how the principles of medicine could be translated into certain and necessary *a priori* axioms and still be well-suited to address the complexity of life that physicians encountered in practice (Risse, “Kant-Schelling” and “Philosophical Medicine”; Tsouyopoulos “Influence”; Wiesing, *Kunst oder Wissenschaft*, 51-6; Schwanitz 24-31).

Reinforcing the difficulty physicians faced in the effort to translate the principles of medicine into an axiomatic science, Kant acknowledged that our experience of organisms differs from that of mechanically structured beings in two fundamental ways that exhaust mechanical explanations. First, we recognize the parts of an organism to be interrelated in such a way that ensures the proper functioning of the whole. That is, all of the parts seem to act in accordance with an organizing principle. Second, this organizing principle does not seem to be externally imposed on an organism, as it is on a machine, but rather internal to each of the parts (*Critique of Judgment* §65; p. 341). In short, the parts of an organism seem to “reciprocally reproduce each other,” such that the organism appears to be “both cause and effect of itself” (Nassar, *Romantic Absolute*, 61). In view of the basic incommensurability between living organisms and mechanical causation, Kant admits that natural researchers have reason to also entertain archetypal or teleological

considerations in their investigations. “Absolutely no human Reason,” he insists “can hope to understand the production of even a blade of grass by mere mechanical causes. As regards the possibility of such an object, the teleological connexion of causes and effects is quite indispensable for the Judgment” (*Critique of Judgment* §77; p. 393). But he is also careful to qualify that such ideas can function only as heuristic aids, necessary handmaidens to true science, which he limits to the mechanical explanations enabled by Newtonian categories (Richards 9; 309).

Kant privileges mechanical explanations over their teleological counterparts in view of his understanding of the discursive quality of the human mind. He distinguishes human cognitive faculties from what he posits as the 'intuitive intellect' on the basis that we require both sense perception and concepts in order to gain knowledge. In this way, our discursive intellect proceeds from the isolated parts of nature and subsumes these parts under the universal concepts of the understanding. As a result, there is always a gap between the particular (what is given in sensibility) and the universal (the concept), such that it can never grasp unity in its diversity (Nassar, *Romantic Absolute*, 61-2). More specifically, by proceeding from the parts to construct a whole, the discursive intellect is incapable of grasping organisms, which are composed of inherently distinctive but mutually supporting parts. Were we capable of perceiving a whole prior to its parts and deriving the latter from the former, then organisms would be an object of knowledge in the strictest sense.

But Kant insists that our understanding is entirely incommensurate with this task.

Gesturing towards the kind of understanding that *could* grasp living organisms, Kant acknowledges that, although such a capacity exceeds the limits of discursive thought, we can nevertheless consider the possibility of an understanding for which knowledge of the whole would precede that of the parts:

We can however think of an Understanding which, being, not like ours, discursive, but intuitive, proceeds from the *synthetical-universal* (the intuition of the whole as such) to the particular, *i.e.* from the whole to the parts. (*Critique of Judgment* §77; p. 389).

It is precisely this mode of thought that the early German Romantics sought to elaborate. Prompted to push beyond Kant's delineation of knowledge and the limits of discursive rationality, they were intent on developing rather than denying the human capacity to grasp organisms as integrated identities, namely *intellectual intuition*. Though they sometimes used different names to describe it, the German Romantics agreed that this form of apprehension must be *intellectual* because it must be capable of seeing ideas and not merely sensible data. And it must be *intuitive*, as opposed to discursive, because it does not grasp empirical objects as things determined by and

known in terms of external conditions, but as a self-subsisting, self-producing unity (Nassar, *Romantic Absolute*, 6). In direct contrast with the discursive intellect, “intellectual intuition grasps the whole *as a whole* [. . . and] thus discerns the ideal unity that underlies and determines the parts and their relations” (Nassar, *Romantic Absolute*, 5). But for Kant it is only in its absence that a finite rationality can relate to this faculty. Albeit entirely reasonable for human cognition to conceive of intellectual intuition as that which enables discursive thought,⁸⁸ he maintains that we are wholly incapable of actually enacting it. In short, the challenge issued by Kant's critical philosophy to convert empirical pseudosciences into a genuine science of *a priori* principles was particularly difficult to implement in the fields of the life sciences and, by extension, in medicine.

'Romantic' Reactions to the Problem of Medical Uncertainty

While the seeming impossibility of cultivating medical knowledge had been percolating in the medical community since Kant published his writings on the limits of human knowledge in the late 1780s,⁸⁹ the urgency of the quest to find

⁸⁸ As Friedrich Heinrich Jacobi famously noted, the discursive intellect results in infinite regress precisely because it seeks to understand something by means of something else. “This implies that the discursive intellect has two options: either it locates an ultimate or final condition, from which all conditions are then derived or derivable or, lacking such an ultimate condition, it fails to grant knowledge of anything. In other words, discursive thought – precisely because it is discursive – has no access to and thus cannot positively assume an unconditioned. After all, for the discursive mind, knowledge is based on *conditions*; an unconditioned, therefore, is beyond its grasp. This means that another, nondiscursive capacity, which would be able to grasp or at least posit an unconditioned, *must be assumed*” (Nassar, *Romantic Absolute*, 6).

⁸⁹ According to Lesky, the question of certainty in medicine was circulating in the field of public health well before the influence of Kant's philosophy and was a central concern of the *medizinische Polizei*.

a rational basis of medicine intensified in August 1795, when a “devastatingly critical review of the state of medical knowledge” (Broman 131) was published in the *Teutscher Merkur*, one of the more influential periodicals of its time: “About Medicine. Arkesilas and Ekdemus” (“Ueber die Medicin. Arkesilas und Ekdemus”). Written anonymously by Johann Benjamin Erhard (1766-1827), a physician and Kantian philosopher, the article exposes the uncertainty of every area of existing medical knowledge and its failure to meet the Kantian criteria of a true science. Though Erhard's provocation was met with considerable opposition,⁹⁰ his criticisms gave voice to the general disillusionment with medicine felt by physicians and patients alike and “Arkeliass” accordingly became the catch-phrase under which medical skepticism in Germany reared its head (Lesky 177).⁹¹

In response to Erhard's article, numerous German physicians embraced the challenge to ground a rational *a priori* medical system from which medical phenomena could be deduced, an effort that the medical historian Karl Rothschuh identifies as one of the main streams in the romantic movement of medicine.⁹² This response represents the first direct impact of Kant's philosophy on the medical profession in Germany and was spear-headed by Andreas Röschlaub (1768-1835), a professor of medicine at

⁹⁰ Such criticism included a sharp rebuttal from Hufeland, who did not agree that medicine was in a state of crisis and was deeply critical of the attempt to further – and, in his opinion, unjustly! – discredit an already undervalued medical profession.

⁹¹ To read more about Erhard's article and its impact, see Broman; Lesky; Tsouyopoulos, *Röschlaub*, 181-84; and Wiesing, *Kunst oder Wissenschaft?*, 56-66.

⁹² See Rothschuh, “Deutsche Medizin im Zeitalter der Romantik.”

Bamberg who endeavored to develop John Brown's (1735-1788) principles of health and disease into an *a priori* medical system that assured certainty in medical practice.⁹³ The central principle in Brown's system is that of excitability, which denotes a basic quality of living matter to perceive and respond to outside impressions. Comparing his contribution to medicine with that of Newton to physics, Brown was convinced that "if gravity is sufficient to explain the planetary motions, so his [theory of] excitability . . . exhibits the same universality" (Risse, "Brownian System," 45). He maintained that all life consists of stimulus and that both over-abundance and deficiency lead to disease. In view of these two polar extremes, he endeavored to quantify the excitability of an organism on a scale of 80 degrees, with 40 constituting the state of health. He was hopeful that the Brownian physician would be able to "express mathematically any given state of excitement, and in the case of disease, the correct number of degrees necessary to restore health" (Risse, "Brownian System," 48).

In view of its numerical elegance, many German physicians recognized in Brown's system the potential to establish a scientific basis of medicine and thereby achieve greater (mathematical) certitude in practice.⁹⁴ Kant himself was hopeful that Brown's principles could provide a scientific basis for medicine and encouraged physicians to pursue this course. In a personal

⁹³ For a description of this response, with examples of participating physicians, see Tsouyopoulos, *Röschlaub* 207-09.

⁹⁴ See Risse, "The Brownian System of Medicine" for more details on how Brown's system promised mathematical certainty.

letter addressed to Erhard, he writes: “That you want to adopt the Brownian system and contribute to its reputation, is, in my judgment, well justified, concerning its formal principles” (qtd. in Risse, “Kant-Schelling,” 146).⁹⁵ And yet, despite Kant's validation of this endeavor, many physicians remained critical of the effort to build an *a priori* medical system. Chief among its critics, Hufeland rejected the preference for speculation exhibited by many Kantian physicians who adopted Brown's principles; he warned that their recourse to theoretical categories did not *illuminate* but rather *invented* medical experience (Schwanitz 25). Hahnemann also weighed in on the controversy, remarking that “no medical sectarian, *apparently*, knew less about nature, than [Brown]” (“Observations” 545). Based on the contradiction between Brown's recommendations and his own clinical experience, Hahnemann concluded that Brown's treatment of disease must be the result of theoretical study rather than practical experience – “he speaks as a blind man would do about colours” (“Observations” 549) – and accordingly regretted that so many physicians mistook the one-sidedness of Brown's system of medicine for genuine simplicity (“On the Value” 494).⁹⁶

Similar criticisms of excessive speculation were also charged against physicians who fell under the influence of Schelling's *Naturphilosophie*, another distinct stream in the romantic revolution of medicine, though one with important points of convergence with Röschlaub's reception of Brownian

⁹⁵ See Risse, “Kant-Schelling” and Wiesing, “Immanuel Kant.”

⁹⁶ See also Hahnemann's “Fragmentary Observations on Brown's Elements of Medicine.”

medicine.⁹⁷ According to Risse, Schelling became “an influential and powerful ally of those 'philosophical' physicians who were bent on unraveling the ultimate secrets of organic nature as the necessary precondition for a genuine science of medicine” (“Kant, Schelling” 155). Indeed, as Nassar observes in her detailed overview of the development of his philosophy of nature, Schelling's first response to the apparent impossibility of understanding organic nature was to deny its independence from human thought. Nassar explains that, insofar as he was still influenced by the idealism of his mentor, Johann Gottlieb Fichte (1762-1814), Schelling's early attempts to explain nature in non-mechanistic terms lead him to understand it as the product of self-intuition, (“From a Philosophy of Self” 313) a move that prompted numerous physicians to turn away from empiricism. They hoped that by engaging with nature through the lenses of speculative philosophy, they would finally escape the bewildering array of biological and medical half-truths that surrounded them. In the words of Risse: “Once the key operative principles in nature were apprehended, with Schelling showing the way, one could by simple deduction erect a complete set of necessary propositions into which all dispersed empirical data could be placed” (“'Philosophical' Medicine” 77).

Insofar as it endorsed German physicians' turn away from empiricism and foray into speculative philosophy, Schelling's influence on the medical tradition has been severely criticized by both his contemporaries and later

⁹⁷ To read more about the ambivalent relationship between Schelling and Röschlaub, see all cited works by Tsouyopoulos.

historians of medicine. As Tsouyopoulos observes, Schelling's philosophy is, as a rule, the one held responsible for corrupting the trajectory of German medicine (*Röschlaub* 7). According to Bernard Cohen,

It has become a tradition among those who talk glibly about science that the romantic *Naturphilosophie* of Schelling and his followers represents the lowest degradation of science and that only by completely freeing themselves from that nightmare were modern biology and medical science able to resume their scientific progress. The incident has been used by empiricists as a moral to warn us against speculative philosophy in the natural sciences (qtd. in Peterson xii).

Reinforcing this interpretation, as a contemporary of the *Naturphilosophen*, Hahnemann writes:

We have to thank the natural philosophers for the disorder and dislocation of many a young doctor's understanding. . . How impossible is it by all these barren *a prioris* to obtain such a just view of the different maladies as shall point out the remedy suited to each – the sole genuine aim of the healing art! How can one justify to a sound judgment the seeking to make these speculative subtleties, which can never be made

concrete and applicable, the chief study of the practical physician (“On the Value” 495-96).

Since the primary danger associated with the physicians' turn to speculative philosophy has been the severance of medicine from observation, contemporaries who resisted its seductive allure are generally celebrated for their conservative reception of and influence on the romantic tradition. Widely recognized as the leader of this more traditional and empirically-based stream in the history of romantic medicine, Hufeland engaged with the theories circulating around him with an explicit interest in their practical consequences. His role as editor of the world renowned “Journals der praktischen Wund- und Arzneikunst” exemplifies this approach. He published a rich plurality of articles all under the motto “Test all things, and retain the best [Prüfet alles, und das beste behaltet]!” (Flatten 34) and promised that “this journal should be neither polemic, nor theoretical, but rather practical [Dies Journal soll weder polemisch, noch theoretisch, sondern practisch seyn]” (qtd. in Wiesing, *Kunst oder Wissenschaft?*, 76). His commitment to tradition and reverence for clinical observation are often credited for his capacity to dismiss the “Errors of the Time [Irrungen der Zeit]” (Wiesling, *Kunst oder Wissenschaft?*, 76; Pfeifer, *Christoph Wilhelm Hufeland*, 74). And yet, it is precisely these qualities that facilitated the integration of certain romantic ideals into the practice of medicine. Hufeland and other empirically-minded doctors were among the most influential in the field of medicine and their openness to medical

innovations they deemed compatible with the tradition of hippocratic medicine allowed the development of certain romantic impulses that would have otherwise remained theoretical ideals (Tsouyopoulos, *Röschlaub*, 154). It is, accordingly, in the work of some of the most scathing critics of romanticism and *Naturphilosophie*, such as Hahnemann, that we find the influence of romanticism and *Naturphilosophie* most fully operative in practice.

The tendency toward speculation and system building was, after all, not the only outcome of the unprecedented intermingling between philosophy and medicine that Germany witnessed in the first half of the nineteenth century. While Brownian medicine did not deliver in its promise to reform the medical system by providing certain, *a priori*, principles to guide medical practice, the lasting impact of Brown's ideas on German medicine, in particular his principle of excitability, cannot be overstated. Indeed, one of the most novel and compelling aspects of Brown's contribution was his insistence that life is only ever a response to outside influences that act upon it. It is neither spontaneous nor independent, but always relies on continual exchange with its environment. As Risse observes:

Brown's stress on the external powers as the active forces governing life and the bodily functions was fruitful for further physiological inquiries. It sharply highlighted the importance of the environment in shaping and conditioning the activities of the organism. Life takes

place and shape only as a response to external influences and is not an independent, internal principle of force (“Brownian System” 46).

According to Tsouyopoulos, Brown's conviction that life is a variable phenomenon, dependent on environmental demands, had a lasting impact on the German medical tradition. After Brown and the Romantics, she argues, “German medicine never returned to the pure mechanism of the eighteenth century” (“Influence” 73). She observes that, since then, the idea of an interactive power mediating organisms and their role in the world has “never ceased to resonate in German medical thinking” (“Influence” 73).

Tsouyopoulos identifies the most important contribution of the 'excitation theory' in its capacity to show that living processes – including disease – are an expression of the interaction between the organism and its environment and, by extension, to demonstrate that it is possible to provide medical explanations of physical effects that are not exclusively mechanistic. With the theory of excitability, she argues, German physicians in the early nineteenth century were able to develop a more sophisticated understanding of pathogenesis than their mechanistic forefathers, one that involved a process of mediation between the organism and the environment in which the organism was simultaneously receptive and resistant. From this perspective, pathogenesis is an interactive play between the outer cause and the counteraction of the organism. Emphasizing the importance of an organism's

susceptibility, this perspective implies that a disease agent is no cause of disease as such, until the organism responds.

Insofar as the non-mechanistic, dynamic accounts of natural organisms proliferating in the German Romantic movement of medicine reinforced a turn away from empiricism, the practical medical benefits of such an ontology have been either completely lost or significantly compromised. Yet, as we will consider in greater detail, although Schelling's early denial of nature's independence of mind was interpreted by many as an epistemological justification for unravelling the principles of nature through speculative philosophy rather than through empiricism, his mature work in the philosophy of nature explicitly emphasizes the importance of observation – albeit in a nuanced way. And while some physicians continued to divorce medicine from bedside practice despite Schelling's own acknowledgment of the importance of observation, others went on to recognize the dialectical interaction between an organism and its environment as an ontological, *observable*, claim which, as we will see in the case of Hahnemann, concretely informed their treatment of disease. As Kuzniar observes, “Like the *Naturphilosophen* at the start of the nineteenth century, Hahnemann poetically believed in the relatedness of everything. Yet, unlike them, he also set out to empirically prove it” (“Romantic Vitalism” 171).

The Power to Observe, the Power of Life

Though openly critical of the theoretical excesses of *Naturphilosophie*, Hahnemann was, as a select few historians of medicine would later come to be, sympathetic to its emphasis on the integrity of the organism and the organism's receptivity to the world. In his review of *Die Lehre von den ansteckenden Krankheiten und Seuchen (The Teachings of Contagious Diseases and Epidemics)* by D. Gutfelt, a book that Hahnemann celebrates for its concrete approach to the dynamic nature of the organism, Hahnemann emphasizes the need to overcome the mysticism of *Naturphilosophie* in order to realize its potential remedial applications, most specifically its approach to observing organisms insofar as they are composed of inherently distinctive but mutually supporting parts:

It is a welcomed prospect for medicine that the euphoric *Naturphilosophie* discards its mystical, poetic skin and purges its external and internal aspects. Its ethereal flight has inspired a lot of good, excellent, young minds to contemplation, and they have elevated it to a level from which it became possible for them to consider the apparatus of the body in health and sickness, as well as all of its parts and functions, as an indivisible whole, and *to discover with the eyes of the spirit*, a finer, dynamic context in the organism than the former mechanical-

chemical physiologists and one-sided solidar- and humoral-pathologists were able to perceive.

[Es ist eine erfreuliche Aussicht für die Arzneykunde, daß die schwärmerische Naturphilosophie ihre mystisch poetische Haut ablegt, und ihr Äußeres und Inneres läutert. Ihr ätherischer Flug erregte eine Menge guter, vorzüglich jugendlicher Köpfe zum Nachdenken, und erhob sie mit sich bis zu einer Höhe, von wo aus es ihnen möglich ward, die Einrichtung des menschlichen Körpers in gesunden und kranken Tagen, so wie alle seine Theile und Funktionen, als ein unzertrennliches Ganzes zu betrachten, und einen feineren dynamischen Zusammenhang in diesem Organism *mit den Augen des Geistes zu entdecken*, als unsere bisherigen mechanisch-chemischen Physiologen und einseitigen Solidar- und Humoral-Pathologen wahrzunehmen vermochten] (428-29; my emphasis).

In its appreciation of the interrelated integrity of the organism and, more importantly, of the capacity to *observe* organisms in their animated contexts, Hahnemann's position resembles that of Goethe, whose nuanced understanding of observation helped salvage the development of the life sciences after Kant's delineation of knowledge and, by extension, supported

the effort to integrate the romantic ideal of interconnectivity into clinical practice. Goethe's contributions also played a significant role in the development of Schelling's *Naturphilosophie*, which, in turn, supplied “enduring structural supports for Romantic theory both in Germany and England” (Richards 46). In short, although he engaged with German Romanticism from a careful distance, Goethe's interest in developing our capacity to observe nature had a lasting impact on the romantic movement and, in particular, its influence on scientific and medical practice.

Indeed, although it is often overlooked in historical accounts of the romantic era of medicine, the impact that Goethe's insights had on the development of the life sciences after Kant cannot be overstated.⁹⁸ In direct contrast with Kant, who attributes our recognition of an organism's growth and development to heuristic aids, Goethe maintained that human knowledge *can* penetrate the inner secrets of an organism without reducing it to Newtonian categories. His detailed observation of plant growth provided a living testament of a natural researcher's capacity to grasp the unity that underlies and determines the parts and their relations. In agreement with Kant that only an intuitive intelligence can grasp organisms, Goethe was unwilling to deprive

⁹⁸ Throughout his ambivalent reception of Kant, ranging from disdain and disinterest to active engagement and endorsement, Goethe remains consistent in his commitment to discovering the ways in which Nature's secrets may be disclosed. More specifically, throughout his scientific writings, he remains a strong advocate of careful – one may even say reverent – observation of natural phenomena. Robert Richards notes that prior to his association with Schiller, Goethe regarded Kantian epistemology as too subjective and insensitive to the “rights of nature” (330). Even after Schiller influenced him to reconsider Kant's emphasis on the mind's active role in scientific inquiry and admit the justice of Kantian epistemology, Goethe still lamented its hostility to a more immediate congress with nature (330; 429).

the patient observer of this capacity. His sojourn in Italy from 1786 to 1788, during which he devoted himself to studying the metamorphosis of plants, had convinced him that the veil surrounding nature was not as impenetrable as Kant's epistemology dictates.

In *The Metamorphosis of Plants* (1790), the book that “seeded a revolution in thought that would transform biological science during the nineteenth century” (Richards 407) – Goethe seeks to elaborate the basic insight that “anyone who has paid even a little attention to plant growth will readily see,” namely, “that certain external parts of the plant undergo frequent change and take on the shape of the adjacent parts – sometimes fully, sometimes more, and sometimes less” (5). Though Goethe limits his investigation to the growth of annual flowers, the impact of his unique approach to the development of the life sciences is extensive. His observation of plant development seeks to penetrate “the hidden relationship among various external parts of the plant that develop one after the other and, as it were, one out of the other (for example, leaves, calyx, corolla, and stamens)” (6). In contrast with previous researchers, who focused on the different *parts* of the plant that appear at various stages of development, Goethe emphasizes the *process* by which one and the same organ appears in a variety of forms (6). He demonstrates that if plant parts are perceived alongside one another, one can begin to recognize continuity between the parts. More specifically, he identifies each part as a moment of either contraction or expansion: “While the

seed is a contraction, the stem leaves are the first expansion. The calyx is a contraction, and the petals are an expansion. The sexual organs are once again a contraction, while the fruit is the 'maximum expansion' and the seed within it is the 'maximum concentration'" (Nassar, "From a Philosophy of Self," 309). From top to bottom, Goethe conceives of the entire plant as different representations of a mutable plant part; this protean "leaf" is united so inseparably with the future bud that one cannot be imagined without the other. By this Goethe does not intend to reduce the plant to the leaf, and reminds his reader that he adopts a common word 'leaf' simply to designate the organ that transforms into the various forms assumed by different parts of the plant.⁹⁹ That is, each plant part assumes a form that is to some degree related to the other parts. At every moment of development, each plant part is a manifestation of the plant whole.

As the developing interrelation between inherently connected parts, what grants a plant unity, for Goethe, is neither a static substance nor a quasi-platonic form that precedes its parts. What unifies a plant is a lawful process of metamorphosis. As Nassar elaborates, "this means that the archetypal plant is only in its parts, but is nevertheless not reducible to any of its parts.

⁹⁹ Holland describes Goethe's difficulty in finding an adequate language to describe living phenomena in a state of change. She notes that the very first of his notes are marked by intense self-questioning concerning both the gendered language of procreation and a proper description of the process of metamorphosis (22). She argues that Goethe's "makeshift solution of 'leaf' ultimately called attention to the fact that there is no available word – indeed, no available language, with which to capture the complexity of the plant's growth and reproduction" (49). This in turn, she argues, led Goethe to the unsatisfactory possibility of tautological definitions whereby he identifies contiguous organs in terms of one another, a problem that can be overcome only if the reader acquires the *intuition* that the narrator wishes to communicate *discursively* (49).

Therefore, although the archetypal plant is an ideal reality, it is not separable from the real. It is what constitutes the real, informing its growth and transformation” (*Romantic Absolute* 197). In short, what grants plants unity, informs the parts, but does not in any substantial way precede them. As a scientist, Goethe's fundamental premise – the premise that countless others after him immediately dismissed – is that “metamorphosis is an ontological principle in which the empirical and the transcendental, the real and the ideal, are not separated. In other words, the metamorphosis of plants refers to a constitutive principle that is not imposed upon the organism by the mind” (Nassar, “From a Philosophy of Self,” 310).

Though he admits that the act of recognition implies a cognitive division, Goethe maintains that we have been granted the ability to reconstitute artificially that which should not have been divided in the first place in order to understand the natural world. In other words, he “affirms that humans have the ability to replicate . . . organic processes. . . as intellectual operations” (Holland 40). It is precisely on this point that Goethe's ambivalence towards Kant's philosophy is most intensified. As he writes:

In seeking to penetrate Kant's philosophy . . . I often get the impression that this good man had a roguishly ironic way of working: at times he seemed determined to put the narrowest limits on our ability to know things, and at times, with a casual gesture, he pointed beyond the limits he himself set. . . Thus our master limits

his thinking person to a reflective, discursive faculty of judgment and absolutely forbids us one which is determinative. But then, after he has succeeded in driving us to the wall, to the verge of despair in fact, he makes the most liberal statements and leaves it to us to decide how to enjoy the freedom he allows us. . . Why should it not . . . hold true in the intellectual area that through an intuitive perception of eternally creative nature we may become worthy of participating spiritually in its creative processes? (100-1).

From Goethe's perspective, intuitive thought and imagination are integral aspects of good science and he recognizes no good reason to deny their possibility. On the contrary, he recognizes all the reason in the world to actively pursue them.

Under Goethe's influence, Schelling developed an aspect of *Naturphilosophie* that he had previously neglected, namely the important role of experiment and observation (Richards 464). More specifically, through his close collaboration with Goethe and his introduction to the theory of metamorphosis, "Schelling was able to put forward a philosophy of nature as self-productive, and, as such, independent" (Nassar, "From a Philosophy of Self," 306-7). In sharp contrast with his earlier position, Schelling later admonished the idea that nature's ground is something other than nature itself and recognized the imperative to think of nature as independent and real (Nassar, "From a Philosophy of Self," 314). For this reason, he argues that

. . . there is no place in this science [*Naturphilosophie*] for idealistic methods of explanation, such as transcendental philosophy is fitted to supply, since for it Nature is nothing more than the organ of self-consciousness . . . The first maxim of all true natural science, to explain everything by the forces of Nature, is therefore accepted in its widest extent in our science (195).

According to Schelling, nature could be self-productive only if there is an original opposition in nature – a primordial duality. Such an opposition, however, is possible only if the products of nature are in a state of infinite development, that is, in a process of metamorphosis. For it is only through infinite development that nature can both infinitely produce and infinitely limit itself. In light of Goethe's description of plant growth as a process of expansion and contraction, Schelling discovered a way to account for duality within a non-reflective, non-conscious being. That is, through the idea of metamorphosis, he could overcome his earlier understanding that duality and productivity are necessarily born out of self-reflection and, as such, grant to nature that which he had previously granted only to the self – independence (Nassar, *Romantic Absolute*, 319).

As Nassar observes, the key to thinking of nature as self-productive is to recognize that what nature *is* cannot be reduced to the products of nature. In other words, nature is not a composite of its *parts* but the *process* that underlies and constitutes these parts. Coinciding with Goethe's shift from plant

parts to the process of plant growth, Schelling's later contributions to *Naturphilosophie* prompt us to conceive of nature not merely as product, but as *productivity*, namely that which underlies and produces the products. It is on this basis that Schelling distinguishes his project from empirical investigation:

Insofar as we regard the totality of objects not merely as a product, but at the same time necessarily as productive, it becomes *Nature* for us, and this *identity of the product and the productivity*, and this alone, is implied by the idea of Nature, even in the most ordinary use of language. *Nature as productivity (natura naturans)* we call *Nature as subject* (with this alone all theory deals) (202).

While Schelling is critical of those “warm panegyrists of empiricism, who exalt it at the expense of science” (201ft), he is precise in criticizing the fact that they take as their object Nature as a mere product. He does not altogether denigrate empiricism. On the contrary, he maintains that “empiricism extended to include unconditionedness is precisely philosophy of nature” (22). Indicative of the importance Schelling grants empirical observation, immediately after ascribing unconditionedness to Nature through its absolute activity, he considers “how can Nature be observed as absolutely active, or more clearly expressed: *in what light must the totality of Nature appear to us, if it is absolutely active?*” (15). He recognizes that without providing a corresponding intuition for all of its concepts, the philosophy of nature would “degrade into an

empty play with concepts” (15).

In view of the limitations of 'blind' empiricism on the one hand and complete disengagement from empiricism on the other, Schelling's *Naturphilosophie* endorses a more nuanced view of observation. In resonance with Goethe's scientific method, Schelling attributes our capacity to recognize the activity in nature's 'apparent products' to an *absolute (intellectual) infinity* whose intuition is originally in us, but which could never come to consciousness without external, empirical exhibition (15). That is, we encounter the unconditioned in Nature as an idea, but, as Nassar emphasizes, it is not thereby heuristic: “it is not a creation of the mind for the sake of ordering and understanding nature. Rather, as nature’s productivity, it is inseparable from nature’s products. It is ideal and not empirical because it is what underlies empirical phenomena, and thus cannot be equivocated with them” (*Romantic Absolute* 318).

And so, in direct contrast with Kant's critical philosophy, Goethe and Schelling affirm our capacity to experience, through a nuanced relationship between careful observation and active imagination, the infinite productivity of organic nature. They elaborate, rather than deny, our capacity to intuit natural phenomena. By extension, they defend the integrity of the life sciences against Kant's concerns that non-mechanistic accounts of biological organization would inevitably betray reason into poetic swooning. “Despite the fancies of critics who hold the contrary,” (Richards 311) a close reading of their

approach reveals an active engagement with empirical experience. Moreover, their contributions prompt us to reconsider the facile prejudice that the romantic tradition that they influenced is an aberration of sound science. Without denying that the influence of Kantian philosophy and *Naturphilosophie* prompted many physicians to turn away from clinical observation, others, albeit often without acknowledging the philosophical basis for their approach, applied the romantic ideal of observing nature as a dynamic process. And, as we will see in the case of Hahnemann, the capacity to observe disease as a dynamic process rather than in terms of the material products that it produces played an instrumental role in implementing the romantic ideals of interconnectivity in medical practice.

Back to the Germinal Stages of Germ Theory

Goethe's experience as a natural researcher convinced him that if we allow intuitive thinking a place in scientific method, then – provided these are deployed in agreement with exact observation and clear thought – a much fuller and more complete experience of nature would be possible. He insists that a “great scientist without this high gift [of imagination] is impossible” (118). But he is also careful to qualify that by this he does “not mean an imagination that goes into the vague and imagines things that do not exist . . . [but rather] one that does not abandon the actual soil of the earth, and steps to supposed

and conjectured things by the standard of the real and the known” (118).¹⁰⁰ Similarly, as indicated by his recognition of the important contribution to the medical tradition made by *Naturphilosophie*, Hahnemann was interested in cultivating physicians' capacity to observe organisms *with the eyes of the spirit*. As Kuzniar observes, “just as the botanist Goethe developed Kant into realms the philosopher cautioned against, so too did Hahnemann” (*Birth of Homeopathy*, Conclusion, location 3144, par. 29). More specifically, although he refrained from claiming medical knowledge of anything that is not rooted in experience,¹⁰¹ he also refused to deny discerning physicians the potential for medical certainty.¹⁰² He maintained that it was, in fact, possible to accurately observe the processes in which living organisms participate and, more importantly, that such observations provided a sufficient basis for effective remediation. He advised that: “There is nothing remediablely diseased nor any remediable invisible disease alteration in the human interior, that would not

¹⁰⁰ Indicative of Goethe's complex relationship with Kant, it was actually his engagement with the *Critique of Judgment* that prompted him to recognize the imagination as an essential faculty for both art and science. Prior to his engagement with the romantic reception of Kant, Goethe warned that the imagination could easily mislead the careful scientist (Richards 377). As Richards observes, “After the tutelage of Schiller and his friendship with Schelling, Goethe would find the message of Kant's third *Critique* – or at least the romantic interpretation of that book – more compelling: namely, that art and science had deep foundations within a nature that encompassed both the subjective and the objective. He would find in imagination not the betrayer of truth but the faculty of creative possibility. And he would be more circumspect concerning scientific theory and the way it might guide one to sound observation. Indeed, after a more studied examination of Kant and the constant urgings of Schiller, Goethe would come to hold that observation itself was theory-laden. One simply had to be aware of that fact and become reflectively cautious (438-39).

¹⁰¹ Confirming the attribution that Josef Schmidt makes in his annotations to *Organon der Heilkunst*, Kuzniar writes that Hahnemann is most definitely alluding to Kant in the sixth section of the *Organon*, where he writes of the futility of medical speculations that are not confirmed by experience (*Birth of Homeopathy*, Conclusion, location 3146, par 29).

¹⁰² See his essay on “Are the Obstacles to Certainty and Simplicity in Practical Medicine Insurmountable?”

present itself for discernment to the exactly observing physician by disease signs and symptoms” (§14). Keenly aware of the futility of empty speculations that cannot be grounded in experience, Hahnemann instructed that, for the discerning physician, disease consists solely in the totality of its symptoms (§6). That is, he recognized the capacity for physicians to apprehend disease as a unified entity by observing the disparate parts (i.e. the myriad symptoms) that it manifests. He affirmed the capacity to intuitively grasp the way in which parts fit into a whole and extended this romantic method of making visible the invisible to the realm of disease and its remediation.

Further reinforcing his commitment to the Romantics' power of observation, in contrast with other contemporary physicians who reference *Lebenskraft* as an animating principle separate from the body's chemical and mechanical processes, Hahnemann understood it as an objective reality beyond human sight but nonetheless permeating all matter and accessible to the human mind through scientific investigation (Kuzniar, “Romantic Vitalism,” 173). Furthermore, in the attempt to grasp the disease process as a misattunement of *Lebenskraft*, he turned his attention toward the process of symptom formation generated by an organism's attempt to restore health. Just as the underlying unity connecting disparate plant parts can be observed through the *process* of metamorphosis, as Hahnemann presents it, so too can the animating force that preserves the integrity of an organism in health and disease, *Lebenskraft*, be observed through the *process* of symptom formation

that ensues when an organism is impinged upon by a disease agent or medicinal substance. From this perspective, an organism can only ever be distinguished as such in view of its unique responsiveness and resistance to its environment. Its singularity is a function of its open exchange with the world.

Approaching the life principle that regulates an organism as it responds to external stimuli, Hahnemann described disease and remedial processes in terms of the initial- and counter-action of remedies. He observed that “most medicines have more than one action; the first a direct action, which gradually changes into the second (. . . the indirect secondary action). The latter is generally a state exactly the opposite of the former” (“Suggestions for Ascertaining” 266). Reinforcing the Romantics' dynamic understanding of a life principle that is both receptive and resistant to the world, Hahnemann explained the dual-action of remedies by distinguishing the symptoms generated by an organism's initial contact with an external stimulus from those resulting from the organism's reaction or counter-action. In §64 of the *Organon*, he observes that during the initial-action of a disease agent or remedy on a healthy body, the organism's *Lebenskraft* appears entirely receptive, as if passively taking in impressions from the outside world. It is only ever in the counter-action of the remedy or disease agent that we experience the reactivity of *Lebenskraft* as it attempts to restore balance by countering the foreign influence, often producing symptoms opposite to those

experienced during the initial encounter.

It is from this dynamic perspective of an organism's relation with the world that Hahnemann could deepen his understanding of the “law of similars,” which, since the time of Hippocrates, had been articulated numerous times throughout the history of medicine. Providing a distinctly romantic perspective from which to consider this age old medical maxim, Hahnemann described its remedial action in terms of an organism's dynamic relations with external stimuli. He reasoned that, if physicians intend to introduce lasting change to a disease state, they should prescribe a remedy that induces an initial action similar to and stronger than the patient's existing symptoms, trusting that the counter-action of the remedy, or, considered from another perspective, the counter-reaction of the organism, will effectively restore health. As he writes in “The Medicine of Experience”:

In order therefore to be able *to cure*, we shall only require *to oppose to the existing abnormal irritation of the disease an appropriate medicine*, that is to say, *another morbid power whose effect is very similar to that the disease displays . . . It is only by this property of producing in the healthy body a series of specific morbid symptoms, that medicines can cure diseases, that is to say, remove and extinguish the morbid irritation by a suitable counter-irritation* (451).

Understood as a dynamic exchange of passive reception and active resistance with external stimuli, Hahnemann's capacity to observe organisms as they engage in living processes and corresponding application of the law of similars preserves organisms as they exist in fluid and porous exchange with the external world.

Informed by radically different epistemological and ontological assumptions, while Hahnemann assigns *Lebenskraft* the role of preserving life amidst a bombardment of foreign influences, his understanding of health and disease differ in important ways from those operative in modern immunology. Distinguishing his method of remediation from the mechanisms of modern medicine, although Hahnemann understood epidemic diseases to be contagious, that is, transmissible from person to person (as opposed to atmospheric), he did not thereby accept that disease material *caused* disease. Rather, he advocated a dynamic, that is, an immaterial, understanding of disease. In the introduction to the *Organon*, Hahnemann extensively criticizes the “Old Medicine” for presupposing in the treatment of diseases nothing other than material causes.¹⁰³ He discounts this approach not only for its vain attempt to gain privileged access to the cause of disease, but also for augmenting patients' suffering: Bloodletting, drawing plasters, and emetics are just a few of the examples that Hahnemann cites to detail the counterproductive practices that the “Old Medicine” developed under the

¹⁰³ To read more about Hahnemann's criticism of materialistic theories of disease causation and their anatomo-political implications, see my essay on “The Embodiment of Chronic Disease in Heilkunst Medicine.”

misguided pretense that it had located the source of disease in disease tissue. Careful not to deny the degenerate materials visible in diseases, he nevertheless viewed them as nothing other than byproducts of disease such that the organism is always engendering new ones as long as it is suffering from disease. Like Schelling, he was critical of forms of empiricism that focused on the products of nature rather than on its processes. In the *Organon*, he accordingly discredits attempts to reduce disease to its final manifestation. “What nosologist,” he asks rhetorically, “ever saw with bodily eyes such a disease-matter, that he could so confidently speak of it and want to build a medical system upon it?” (§23.4). In his assessment, medical men were so overwhelmed by the absence of a sensible cause of disease that they devised a cause for themselves rather than acknowledge that health and disease involve a dynamic interplay between the organism and the environment and accordingly develop their capacities to observe these living processes.

Although Hahnemann's sophisticated observations of contagion have been viewed by some as an early prototype of modern germ theory, his dynamic understanding of disease and related methods of observing living organisms distinguishes his understanding of etiology from the two pillars that would eventually provide the foundation for modern medicine: immunity and germ theory (Cohen 18). As Cohen observes, the concept of immunity-as-defense “lends germ theory some of its legal force, helping it achieve the

status of natural law” (Introduction, location 162, par. 9). After all, the conviction that germs *cause* disease begs the question of why they cause disease in some organisms and not in others. Cohen argues that a defensive theory of immunity helped establish the supremacy of “germ theory” over other competing models of disease causality by addressing the fundamental question that it raised, that is, by accounting for how some remained unscathed by the presence of disease-causing pathogens (Introduction, location 162, par. 9). He understands this theoretical maneuver to be a definitive one: “Instead of evoking the organism's essential connection to the world in which it lives,” Cohen tells us, immunity-as-defense “refigures medicine as a powerful weapon in the body's necessary struggle to defend itself from its life-threatening context” (Introduction, location 171, par. 10).

In direct contrast with this modern development, Hahnemann references the observation that some organisms are unaffected by the transmission of disease in order to discredit the theory that disease material causes disease. Rather than reinforce the theory that morbidic agents cause disease by positing a defensive immunitary mechanism to save the phenomenon that would otherwise suggest that contagious diseases are discriminating, he dismisses it in light of the evidence.

The causes of our diseases cannot be material, since even the slightest foreign material substance, even when it appears to us as ever so mild, brought into our blood

vessels is suddenly expelled by the Living Power (*Lebenskraft*), like a poison; or, where this is not the case, death is the consequence.

[Materiell können die Ursachen unsrer Krankheiten nicht seyn, da die mindeste fremdartige materielle Substanz, sie scheine uns auch noch so mild, in unsre Blutgefäße gebracht, plötzlich, wie ein Gift, von der Lebenskraft ausgestoßen wird, oder, wo dieß nicht angeht, den Tod zur Folge hat (§23.1).

Acknowledging that disease spreads through noxious disease material, in “Spirit of the Homeopathic Doctrine,” Hahnemann argues that if morbidic injurious agents, which surround us every day and every hour, could derange health unconditionally, they would not leave a single person in good health. But this is not the case. He insists that disease is, for the most part, an exceptional state of human health, one that requires a number of enabling conditions on the side of both the disease agent and the affected individual. In other words, “the individual is so little liable to be affected by such injurious agencies, that they can never unconditionally make him ill” (627).

Hahnemann's observation that such disease material does not have the power to derange unconditionally the health of an organism prevents him from venturing claims of material causation and, by extension, from assuming the kind of organic uniformity necessary to generalize the effects of medical

intervention. Instead, he accounts for the exemption of certain individuals from falling prey to communicable disease in terms of their unique capacity to maintain and restore equilibrium in relation with the environment. His understanding of *Lebenskraft* as an observable dynamic of simultaneous receptivity and resistance prevents him from positioning organisms in exclusively defensive relations with the world, as modern immunology would later do. By extension, his approach to preventing epidemics implies an alternative approach to individuating life and immunizing communities than that operative in the contemporary practice of vaccination.

Chapter Six: The Romanticization of Immunization

In order to understand the significance of the “alternative” to vaccination that homeopathy represents, it is important to first acknowledge how deeply intertwined the histories of these disparate medical traditions are. While the homeopathic community would later develop to include some of the most salient critics of vaccination, on numerous occasions Hahnemann himself cited the efficacy of inoculation with cowpox against smallpox as a vivid confirmation of the “law of similars”—the medical principle that “like cures like,” which was the philosophical basis for his own remedial system. Yet, in contrast with the modern trajectory of Jenner's findings—findings that would rely on mathematical analyses for legitimation before discoveries in immunology could retroactively explain vaccination’s mechanism of action—the observed efficacy of vaccination did not lack theoretical foundation within the context of homeopathy. Within Hahnemann's remedial system, vaccination not only did not require the calculus of probabilities to usher it into an accepted mode of rationality; its appropriation by homeopathy categorically precluded recourse to risk analysis.

Hahnemann recognized in the prophylactic power of vaccination a preventative strategy that could be extended to protect people from other contagious diseases without actively introducing harm. In fact, the critical point that distinguishes his innovations from the modern development of vaccination is that Hahnemann was intent on developing this technique in a way that could

not possibly introduce an element of risk. Describing himself as a man of “conscientious scruples,” his fear of inadvertently bringing harm to patients in his efforts to heal them was so great that he abandoned his medical practice for some time, occupying himself with chemistry and literary pursuits until the sickness of his own children prompted him to return to the medical field in search of safe and effective forms of treatment (“Extract from a Letter” 512). Throughout his career, he maintained that a true remedial artist who works according to principles will never put the life of his patient in risk (*Organon* §285.1). His sustained observation of *Lebenskraft*'s protective capacities prompted Hahnemann to look for non-invasive methods to stimulate this capacity rather than opt for methods of preventing disease that could actively introduce harm.

Refusing on principle to justify a medical intervention in terms of its numerical advantages, Hahnemann's evaluation of vaccination stands in stark contrast with the medical arithmetic that would effectively dissolve the ethical difference between death or injury caused by disease versus by prophylactic intervention. That is, he was primarily concerned not with the *relative* safety of vaccination (as compared with variolation or natural exposure), but with its *actual* safety¹⁰⁴—a concern evidenced by his reservations about the way

¹⁰⁴ This remained one of the most distinctive features of the homeopathic response to vaccination. In his nuanced and comprehensive reading of the late-nineteenth-century response of American homeopaths to smallpox vaccination, “Sectarian Identity and the Aim of Integration,” Eberhard Wolff identifies a remarkable concern about the side effects of vaccination as the most distinguishing feature of homeopathy's response to vaccines. While it was certainly not uncommon for critics of vaccination to emphasize its deleterious effects, conventional physicians in favour of the practice in orthodox and heterodox circles alike tended to defend it as a harmless procedure. Yet,

vaccines were administered and his continuous search for prophylactic strategies that were risk-free. Providing a fascinating counterhistory to the modern development of vaccination, Hahnemann's reception of Jenner's technique provides critical insight into the modern mechanisms that ushered vaccination into mainstream practice, and, more importantly, their historical contingency.

Hahnemann's Initial Response to Infectious Disease

Well before Jenner's discovery, Hahnemann considered the prevention of infectious disease to be a critically important area of medicine. In 1784 he worked briefly as a public health officer in the provincial town of Gommern, a post that had been established in response to the plea that the majority of the town would otherwise perish in the face of disease—and he continued to apply for such posts throughout his career (Jütte 18). Like other physicians vying for such prestigious positions, several of his early writings focus on preventative public health strategies¹⁰⁵ and, in the absence of specific

strikingly, in the homeopathic community, even pro-vaccination authors frequently stressed the side effects of vaccination. Although basically approving vaccination, Wolff finds, they were always aware of its potentially dangerous, long-term, effects. Furthermore, those who, despite the various side effects, nevertheless recommended the practice, only very rarely did so by weighing the risks and the benefits and concluding that the risks were fewer than those of withholding vaccination. More common was the optimism that any adverse effects from the vaccines could be in turn addressed with homeopathic remedies (106). In other words, homeopathic practitioners reached their decision to vaccinate not by relativizing the risks of vaccination to those of acquiring an infectious disease, nor by considering the net outcome of the procedure in view of the population (in order to argue, for example, that only a negligible fraction of it would fall prey to vaccination's side effects).

¹⁰⁵ See, for example, the sections on “Protection Against Infection in Epidemic Diseases,” and “Suggestions for the Prevention of Epidemics in General, Especially in Towns.”

prophylactic protocols for the various contagious diseases of his time, Hahnemann found it necessary to provide general guidelines for preserving health.¹⁰⁶ To this end, he advocated good hygiene, social distancing, conscientious diet, and supportive supplements, having witnessed such preventative strategies arrest an epidemic in full:

I have seen extremely malignant sporadic dysentery and putrid fever nipped in the bud at the very onset and without consequence by hygiene, good visitation guidelines, appropriate diet, and helpful medicaments. Yes, I have seen entire epidemics contained by the replication of similar efforts, like a swelling sea that is stopped by the dunes. I accordingly do not venture too much when I help clarify the nature of contagious diseases by making the following claim: in the early stages, epidemics are to a large extent easily suppressible diseases of the individual, which, through negligence and ignorance, degenerate into an angel of death and, finally, through the spread and accumulation of disease material, become infinitely more than they were when they first emerged. If I remove longstanding,

¹⁰⁶ “Now as we know of no specific antidotes for the several kinds of contagious matters, we must content ourselves with general prophylactic means. Some of these means are sometimes in the power of the patient, but most of them are solely available by the nurse, the physician, and the clergyman, who visit the sick” (“Protection Against Infection” 168).

unhealthy inclement weather, deficiency, and poverty from my consideration, the remaining blame must be placed almost exclusively on the institutions, nurses, and doctors who are in a position to create malicious diseases out of relatively mediocre ones through their poor conduct.

[Ich habe sehr bösartige sporadische Ruhren und Faulfieber gesehen, die durch Reinlichkeit, gut Aufwartung, zweckmäßige Diät, und hilfreiche Arzneimitteln in ihrer Geburt ohne Folgen erstickt wurden. Ja, ganze Epidemien habe ich gesehen, die durch ähnliche nur vervielfältigter Bemühungen, wie das aufgeschwollene Meer durch Dünen, aufgehalten worden sind. Ich wage also nicht zu viel, wenn ich, um durch meine Aufmerksamkeit auch etwas zur Aufklärung der Natur ansteckender Krankheiten beizutragen, behaupte: dass Epidemien in ihren Anfängen grösstentheils leicht zu unterdrückende Krankheiten einzelner Personen sind, die nur durch Nachlässigkeit und Unwissenheit zu einem allgemeinen Würgeengel ausarten, und zuletzt durch Mittheilung und Anhäufung

der Krankheitsmaterie unendlich mehr werden, als sie bey ihrer Entstehung waren. Nehme ich also eine anhaltend ungesunde Witterung, nehme ich Mangel und Armuth aus, so fällt die übrige Schuld fast allein auf Anstalten, Krankenwärter und Aerzte, die durch vereinigt schlechtes Betragen allein schon im Stande sind, mittelmäßige Krankheiten zu böartigen umzuschaffen.] (“Ueber ein katharralisches Faulfieber” 35).

In view of his understanding of the aspect of an organism's *Lebenskraft* that preserves its health [*Lebens-Erhaltungskraft*], Hahnemann's initial response to epidemics emphasized the importance of effectively treating contagious diseases when they first emerge, at the level of the individual organism and its immediate surroundings, and of preventing them from spreading with proper regimen, lifestyle practices, and socially distancing.

In Hahnemann's early writings on preventing the spread of infection, Kuzniar recognizes echoes of “the notion of guarding and protecting the self that inoculation and/or vaccination represent,” that is, that “a small dose of a poison will boost one in the face of a dangerous exposure” (*Birth of Homeopathy*, Ch. 3, location 2724, par. 61) or, in Hahnemann's words, that “[t]he Creator of mankind has so ordained that *habit* shall be a protector against many dangers” (“The Visitor of the Sick” 166). In particular, she points

to Hahnemann's writings on "Protection Against Infection in Epidemic Diseases," where he advises clergymen and physicians who approach a sick patient to "see their patients more frequently, but each time stay beside them as short a time as possible" (169). Hahnemann's recommendations are based on his general opinion that "as in the case with accustoming ourselves to everything, *the advance from one extreme to the other must be made with the utmost caution, and by very small degrees*" (168-9). From this perspective, he believes that "only cautious nurses and physicians" can enjoy immunity from infection against epidemic diseases; that is, only those who "accustom themselves to it very gradually, continue to habituate themselves and employ various precautions in order not to be destroyed by the murderous exhalation" (167). Such precautions include keeping as far away from the sickbed as possible, arranging for the room to be aired before arrival (169), and, of no less importance, maintaining one's "mind and body in a good equilibrium" (170).

While resonating with the general idea that careful exposure to disease can help establish later protection against it, Hahnemann's advice on how to most prudently approach communicable diseases differs from the modern development of vaccination in significant ways. Most notably, although Hahnemann recognizes that a toxin in small doses can ultimately strengthen an organism, he does not use this observation to formulate a general prophylactic strategy or to issue blanket recommendations. On the contrary,

he is careful to reserve his advice on approaching sick individuals to clergymen, physicians, nurses, and family members of the patient, that is, to those who cannot avoid exposure. Indeed, in view of the contagious nature of epidemic diseases, he considers it to be “highly criminal, [or] at least very imprudent, for the healthy lady to sit beside her deadly-sick gossip for hours at a time without the slightest necessity” (166). Since the casual visitor is “totally unused to the insidious miasm,” he argues that if she insists on visiting her infected friend, “she runs the greatest risk to her life. She may be happy if her imprudence does not make orphans of her children, or even cause the death of all of them, without any fault of theirs” (167). As indicated by this cautionary note, Hahnemann understood an organism's robustness against disease in terms of an ongoing and uniquely individual process of exchange with its environment rather than herald it as a state of immunity that can readily be achieved by all through a single encounter with disease material. He appropriately focused on an individual's unique susceptibility to infection instead of generalizing the risks of immunization across the population.

This perspective is also apparent in his general criticism of approaches to health that involve a defensive hardening of the organism, a list on which Kuzniar includes vaccination. In Hahnemann's commentary “On Making the Body Hardy,” published in 1792, he remarks that “modern hardening methods seem to bear a great resemblance to the incautious transference of hot-house plants to the open air in February” (194), a rather apt criticism of the naïve

assumptions surrounding the early practices of inoculation. That is, he criticizes modern methods of building robustness insofar as they have been removed from the necessary preparatory processes that nature always provides. As Hahnemann observes,

Nature does nothing without preparation; all her operations are performed gradually, and the more complex and artistic the work is that she performs, so much the more cautiously and gradually does she do it. She never goes from summer to winter without interposing the transition period of autumn (193).

Extending this metaphor, Hahnemann urges his fellow physicians to “imitate nature – let us never make January to follow close upon June, nor July upon January, if we do not wish our tender plants to be blasted and withered by both of those extremes” (194). As a further precaution against exposing individuals to dangerous extremes, Hahnemann advises that each and every individual must be allowed to engage in such practices according to his own strength and “must be allowed to draw back when he wishes to do so” (196). And as we will see, the respect for an individual's unique balance of receptivity and resistance that Hahnemann expressed early in his medical career remains consistent throughout his later work on preventing epidemic disease, including his ambivalent reception of vaccination.

Hahnemann's Developing Views on Vaccination

At the time that Jenner first published his findings, although the German territories had significantly rebuilt the population they had lost during the Thirty Years' War, the aim of increasing the population was continually jeopardized by crop failures, famines, and epidemics. Government officials were particularly concerned about the high infant mortality rate. Roughly half of all children died before the age of six; many of them were victims of whooping cough, measles, scarlet fever, diphtheria, and above all, smallpox. Claudia Huerkamp reports:

In years of severe smallpox epidemics, like 1766, 1786 and 1801, more than 20 per cent of all deaths in Berlin were caused by smallpox. According to contemporary estimates, toward the end of the eighteenth century in the German states, there were 70,000 deaths a year from smallpox and in Prussia alone over 40,000 a year (62).

According to late eighteenth-century German statistics, nearly one fifth of total deaths in the population was due to smallpox (Maehle, "Conflicting Attitudes," 200).

Despite the general disinterest in or resistance to variolation, the hope that smallpox could one day be eradicated persisted as a central theme (Maehle, "Conflicting Attitudes," 211). It is therefore of little surprise that

German physicians and government officials were eager to implement Jenner's method. After all, vaccination “offered an apparently harmless remedy for smallpox, which was easy to apply and avoided the dangers of inoculation” (Huerkamp 620). With less competition from older methods, such as variolation, Jenner's innovation of inoculation was embraced early (Baldwin 250). Unlike the diffusion of information about variolation that had circulated slowly over the course of a century, knowledge about Jenner's cowpox experiments spread rapidly. A German translation of the *Inquiry* was published in Hannover in 1799 (Jannetta 36), and since Britain was at war with France and the Netherlands when Jenner published his findings, Germany was the first foreign country to receive vaccine material, which was delivered as parcels of dried lymph the following year (Baldwin 250). The boards of health in all German states were urged to test vaccination and, once its efficacy could be demonstrated, encouraged to promote its widespread use.

In view of the state's active engagement in the implementation of this prophylactic method, the medical profession—including university-trained physicians and barber-surgeons alike—recognized vaccination as a chance to increase their prestige and their influence on public health affairs. While state authorities had previously viewed as utopian the medical professions' efforts to bring the whole population under medical control, vaccination made this goal seem that much more attainable (Huerkamp 621-22), and quickly

became the most attractive field of intervention for the medical police (Wolff, *Einschneidende*, 25).¹⁰⁷ Although Hahnemann continually positioned himself in antagonistic relation with the medical profession and its methods—which he himself had been taught at medical school but which he was quick to criticize (Handley 53; Thoms 174)—he recognized vaccination as one of the few effective techniques available to his contemporaries.¹⁰⁸

Indeed, despite his confidence in the possibility of mitigating the most devastating effects of contagious disease through healthful living, Hahnemann was still inclined to approve of Jenner's prophylactic strategy. Moreover, he considered the prevention of smallpox by cowpox inoculation to be a serendipitous discovery—a *Glucksfund*—that further confirmed his medical principle, “*similia similibus*” (“Auszug eines Briefs” 497). On several occasions, he explicitly references cowpox as an effective prophylactic measure against smallpox because of the similarity between these two diseases, that is, the similarity of the symptoms that they generate. As early as 1801, he writes that:

It is only in accordance with my well known maxim (the new principle) that small-pox, to give one example from

¹⁰⁷ Frank organized a vaccination trial in September 1801, vaccinating thirteen children at the General Hospital of Vienna. When none of the children reacted to the subsequent smallpox inoculation, this successful trial was used as official support for the method (Rusnock, “Medical Statistics,” 342), and Frank's followers enthusiastically embraced Jenner's protocol for their own purposes. In retrospect, Frank considered his endorsement of Jenner's method to be one of his finest moments (Cohen 270).

¹⁰⁸ As Inge Christina Heinz observes, it was especially doctors, like Hahnemann, who were committed to the ideals of the Enlightenment and the hope of diminishing, or better yet eradicating, the effects of a devastating disease, who were most enthusiastic about the promise of vaccination (Heinz, “Hahnemann und die Pockenimpfung,” 181). And vaccination was, in the words of Wolff, a vivid incarnation of enlightenment ideals in practice (“Inkarnation praktizierter Aufklärung”) (Wolff, *Einschneidende*, 12).

among many, has an important prophylactic in the cow-pox, which is an exanthematous disease, whose pustules break out after the sixth day of inoculation, with pain and swelling of the axillary glands, pain in the back and loins and fever, and surrounded by an erythematous inflammation—that is to say, constituting altogether a disease very similar to variola (“Cure and Prevention of Scarlet Fever” 370).

Notwithstanding its resonance with vaccination, it is important to note that Hahnemann's application of the principle of similars was primarily grounded in the observable *processes* induced by *remedies* on diseases producing similar symptoms rather than the *mechanical* transfer of disease *material*. His first expression of this principle, which would later become the foundation of his remedial system, appears in Hahnemann's translation of William Cullen's *Treatise of Materia Medica* in 1790. In an extended footnote, Hahnemann disputes Cullen's claim that Peruvian Bark effectively treats intermittent fever because of its “tonic” effect on the stomach. Referring to his own experiments ingesting the substance, he observes that it produces symptoms similar to those produced by the disease it is intended to treat and suggests that it was this similarity that was curative and nothing else (Handley 60-61; Jütte 2012, 22).

It was not until 1796 however—noted by many as the year in which

Jenner performed his first vaccination—that Hahnemann presented his hypothesis as a new principle of medicine. In an article published in *Hufeland's Journal for Applied Medical Science*, appropriately entitled, “Essay on a New Principle for Ascertaining the Curative Power of Drugs,” he offers a more detailed description of his proposed art of healing:

Every powerful medicinal substance produces in the human body a kind of peculiar disease; the more powerful the medicine, the more peculiar, marked, and violent the disease.

We should imitate nature, which sometimes cures a chronic disease by superadding another, and employ in the (especially chronic) disease we wish to cure, that medicine which is able to produce another very similar artificial disease, and the former will be cured; similia similibus (265, original emphasis).

In the *Organon*, he specifies that a remedy can have a remedial effect when it excites an artificial disease in the organism that is not only similar to, but also more intense than, the natural disease (§26; §58.1).

Although Hahnemann grounds his principle in the observation that the natural occurrence of a disease has the capacity to cure an existing chronic disease if it is sufficiently similar and stronger, he attempts to mimic this mechanism with medicine, which, insofar as it produces symptoms, he defines

as a kind of artificial disease. He substantiates his proposed principle with numerous examples of the medicinal effects of various substances and their potential (or actual) use: he draws on cases of accidental poisonings, his own experiences testing remedies on himself, and examples from the contemporary medical literature. According to historian Rima Handley, Hahnemann had independently considered the injection of disease material to be an extension of his principle, but rejected it because of the risks involved in introducing matter derived from the human body (64). His wariness of applying the 'law of similars' with crude disease material is especially apparent in section 50 of the *Organon*. Having listed numerous examples in the medical literature of "the itch," measles, and smallpox resolving diseases of similar symptomology in those infected, he adds that these morbidic agents, though they have the potential to act as homeopathic remedies, are either more life-threatening than the disease they are poised to cure or themselves require treatment. In both cases he considers their employment as homeopathic remedies to be difficult, uncertain, and dangerous. More specifically, he prefers the homeopathic application of remedies over the inoculation of disease material because the former can be diminished according to circumstances, while the latter must run its tedious course.¹⁰⁹ Furthermore, he

¹⁰⁹ According to supporters of isopathy, it *is* possible to harness the curative power of disease material with the same precision that Hahnemann attributes to the administration of medicine, that is, by preparing and administering it in the same way that homeopathic remedies are prepared (i.e. through dilution and potentization). In a footnote added to section 56 of the *Organon*, Hahnemann addresses this mode of administering medicine as a method of curing a given disease by the same contagious principle that produces it. Responding to isopaths' attempts to displace homeopathy, the treatment of similars, with isopathy, the treatment of equals and the same, Hahnemann insists that, even granting

remarks, there are so few diseases that find their similar remedy in infectious diseases! And so, in order to both extend and perfect nature's method of curing disease through the principle of similars, he recognizes the importance of turning to remedies.

It is, I think, in view of Hahnemann's acknowledgment of both the efficacy of Jenner's method and the inherent risks involved in its application that we can best understand the nuances of the former's response to this prophylactic procedure. On the one hand, his identification of vaccination's agreement with the principle of similars provided the basis for his understanding of its efficacy. In the *Organon*, Hahnemann references the observation that the contraction of smallpox can immediately lift a case of cowpox as an indication of the similarity between the two diseases and the greater intensity of smallpox. He reasons that although cowpox cannot, due to its relative weakness, entirely prevent smallpox, it can at least greatly diminish the malignancy of the disease.¹¹⁰ In view of this capacity, Hahnemann accordingly attributes the dramatic reduction of smallpox that he observed in his lifetime to the widespread acceptance of the procedure. In the sixth edition of his *Organon*, prepared in 1842,¹¹¹ one year before his death, he observes

that it is possible to cure a given disease by the same contagious principle that produces it, since the infectious agent is given to the patient in a highly potentized form, that is, in an altered condition, the resulting cure can be accomplished by nothing other than the principle of similars. See Decker and Verspoor, "Hahnemann's Views on Isopathy and Isopathic Remedies," 38-40.

¹¹⁰ As Rudi Verspoor explicates, "[t]he conclusion is that the weaker similar disease (cowpox) does not act preventatively against the incoming disease but lessens its impact."

¹¹¹ "Due to a combination of adverse circumstance this manuscript remained unpublished for 79 years, until Richard Haehl (1921) and William Boericke (1922) edited and published German and English editions respectively" (Schmidt 42).

that since the general distribution of Jenner's Cow Pox vaccination, human smallpox never appeared as epidemically or as virulently as it did forty years before its introduction when some cities lost at least one half and often three-quarters of its children to this miserable disease (footnote 47; §46; see *Organon-Synopse* 339). On the other hand, Hahnemann's understanding of vaccination's mechanism of action did not blind him to the potential risks of the procedure. His careful attention to the process of symptom formation induced in an organism by the deliberate transfer of disease – and general preference for gradual, incremental exposure over abrupt transplantation – prompted him to also hone in on the adverse effects of this medical intervention. He accordingly expressed concern over the possible contaminants conveyed through arm-to-arm transmission, and considered it both safer and more effective to obtain cowpox material from cow udders rather than from the arms of poor children. In a letter to Dr. Schreeter of Lemberg, for example, written on 19 December 1831, Hahnemann expresses his preference for inoculation with cowpox material derived directly from the cow, and offers practical advice when this is unavailable:

In order to provide the dear little Patty with the protective cow pox, the safest plan would certainly be to obtain the lymph direct from the cow; but if this cannot be done . . . I would advise you to inoculate another child with the protective pox, and as soon as slight redness of the

puncture shows it has taken, I would immediately for two successive days give *Sulphur* 1-30, and inoculate your child from the pox that it produced (qtd. in Davidovitch 13).¹¹²

Further substantiating his preference for cow lymph, in a letter to Clemens Bönninghausen, dated 13 May 1832, Hahnemann expresses his concerns about the unintended infections transmitted by arm-to-arm vaccination:

I have been spared from those infected by the malignant smallpox, who are not seldom circulating here. Why do we not graft cowpox directly on the udders of cows, which would certainly provide more protection and avoid the danger of transmitting *Psora* that exists when vaccine material from sick children is used?

[Von böartigen Menschenpocken-Kranken bin ich noch verschont geblieben, die hier herum nicht selten sind. Warum pflanzt man die Kuhpocken nicht an Kuheitern fort, da diese gewiß mehr schützen werden und wobei man nicht Gefahr läuft, Psora mit einzuimpfen, wie durch den Impfstoff von elenden Kindern?] (57-58).

Notwithstanding these concerns, in both his publications and letters written to colleagues, Hahnemann remained an unambiguous supporter of vaccination.

¹¹² For the original letter by Hahnemann, see “Briefe an Dr. Schréter in Lemberg.”

Though he expressed reservations about the safety of how it was being administered, his conviction about its mechanism of action prompted him to refine the technique rather than abandon the underlying principle. This nuanced position is perhaps most clearly articulated in a letter written on 3 January 1825 to Herr Gevatter, regarding critics of vaccination. On the one hand, Hahnemann recognizes in vaccination the therapeutic principle underlying his own teachings; on the other hand, he insists that criticisms of the practice can only ever help to improve the method of vaccination. After comparing those who criticize his remedial system with those who resisted the truth of Martin Luther's reformation, he turns to the subject of anti-vaccination:

What harm have the shameful refutations of the cowpox inoculation done? Nothing, absolutely nothing! In fact, they have contributed to the excellence of vaccination by demanding more thorough examination and understanding. No need to worry! Everyone stands by the truth, which can be neither blurred nor corrupted. In the future people will stick more to my words of experience.

[Was haben die schädlichen Gegenschriften der Kuhpockenimpfung geschadet? Nichts, garnichts! Sie haben mehr dazu gedient, ihre Vortrefflichkeit desto gründlicher zu untersuchen und einzusehen. Also nur

ruhig! Ein Jeder bleibe bei der Wahrheit stehen; diese kann nun nicht weiter verwischt, auch nicht verfälscht werden. Man wird sich doch dereinst mehr an meine Erfahrungsworte halten] (390).

While he was clearly interested in refining the technique rather than abandoning the principle of vaccination, in his own practice, Hahnemann did not always consider inoculation with cowpox to be a viable option, and he accordingly sought gentler alternatives for his sensitive patients. As Inge Heinz observes in her comprehensive review of Hahnemann's treatment of the Prussian Princess Luise, he was certainly aware of, and at least in her case showed preference for, prophylactic alternatives to vaccination. In March of 1833, the princess wrote to Hahnemann for advice about how she and her family could protect themselves from contracting the smallpox that had been circulating in their community. Assuming that the princess' vaccination from thirty years ago would no longer be effective, Hahnemann nevertheless did not recommend revaccination. In a letter written in April 1833 to the Princess' general practitioner Aegidi, Hahnemann writes:

I have experienced on several occasions an entire family, in which one of its members had smallpox, remain protected when I let every family member smell *rhus toxicodendron* every 10-14 days. You could do this for both princes. The princess herself, however, is much

too sensitive for such a remedy. She has to keep her distance from people who have been in smallpox-infected households. For her there is no other preventative remedy.

[Ich habe einige Erfahrung gemacht, daß ganze Familien, in deren Haus ein Pockenkranker entstand, geschützt worden, in dem ich jedes Familienmitglied alle 10-14 Tage einmal an toxic [*rhus toxicodendron*] riechen ließ. Dieß könnten Sie mit den beiden Prinzen thun. Die Prinzessin selbst aber is viel zu reizbar gegen eine solche Arznei. Diese muß sich bloß vor / Nähe von / Personen hüten, die in Pockenhäusern gewesen sind. Anders giebts für dieselbe kein Vorbauung Mittel] (qtd. in Heinz 193).

Indicative of his emphasis on the singularity of an individual's susceptibility, even in the case of prescribing homeopathic remedies specifically prepared to ensure safe administration, he did not issue blanket recommendations: for the princess' sensitive disposition, he considered social distancing to be the only available option. In response to the princess' expressed preference for homeopathic alternatives to vaccination, for the princes he extended Jenner's prophylactic principles to the use of homeopathically prepared remedies.

As evidenced by his early writings on prevention epidemic diseases,

Hahnemann was well aware that infection occurs most frequently and most fatally in previously unexposed individuals. And it is with this dynamic understanding of contagion that Hahnemann advised, on the one hand, highly susceptible individuals (such as Princess Luise) to avoid social contact when a contagious disease is in circulation and, on the other hand, that he recognized that robustness is acquired through continual re-exposure, a process that he endeavored to facilitate with the use of homeopathically selected remedies. Approaching contagion and immunity as a delicate interchange between an organism and its environment, Hahnemann consistently favoured individualized recommendations. His nuanced understanding of disease etiology precluded uniform prescriptions.

From this perspective, it is not surprising that Hahnemann was prepared to acknowledge that the protection provided by vaccination was neither absolute nor lifelong. Demonstrating the development of his thought, Hahnemann was initially open to the suggestion that the protection provided by cowpox could last an entire lifetime. In the second (1819), third (1824), and fourth (1829) editions of his *Organon*, he reasoned that since, as a rule, the human organism usually contracts only one disease of this kind (smallpox or cowpox) in a lifetime, susceptibility to smallpox can be prevented for life:

So cowpox brings forth a disease that is very similar (homeopathically) to smallpox, which, after it has run its course, all susceptibility of the human

body to cowpox or smallpox is prevented for a lifetime, because the human body is, as a rule, capable of having only one of this once-in-a-lifetime kind of disease (cowpox or smallpox).

[So bringt die Kuhpocke eine der Menschenpocke sehr ähnliche (homöopathische) Krankheit hervor, nach deren Verfluß, da der menschliche Körper in der Regel nur einer im Leben einmaligen Krankheit dieser Art (der Kuhpocke, oder der Menschenpocke) fähig ist, alle Ansteckbarkeit desselben durch (Kuh- oder) Menschenpocke auf Lebzeiten gehoben ist (*Organon-Synopse* 193).]

But by the fifth edition, published in 1833, this passage had been omitted, and we know from his case notes for Princess Luise that he did not expect her to still be immune thirty years after being vaccinated (Heinz 192).¹¹³ Unrestrained by the epistemology of risk analysis and its suppression of waning or failed immunity, Hahnemann's romantic proclivity for honing in on individual variations led him to adopt what is retrospectively considered to be a more sophisticated and nuanced understanding of immunity than most early

¹¹³ Directly involved in the practice of vaccination, like Hahnemann, Hufeland also did not show unrestrained enthusiasm for vaccination. Although he was instrumental in introducing and popularizing the procedure in Germany, he was skeptical that it could provide lifelong protection. Based on numerous articles published in his journal on the subject and his own experience, he eventually introduced revaccination at a later point in time to achieve longer-lasting protection (Pfeifer, *Medizin der Goethezeit*, 197).

supporters of variolation and vaccination.

Dynamize the Medicine to Singularize the Response

It was early in his reception of vaccination that Hahnemann recognized in the procedure a principle that could be further developed to prevent the spread of contagious diseases in a safe and effective way. In 1801 he extended his understanding of Jenner's findings to the use of *belladonna* in the prevention of scarlet fever, arguing that its mechanism is the same as cowpox inoculation against smallpox, namely, that the remedy generates symptoms similar to those of the disease it is meant to prevent. In view of the remedy's capacity to immediately arrest the development of scarlet fever when administered at the onset of the disease, Hahnemann reasoned that its most effective use would be prophylactic. In an article outlining the process of his discovery, he describes how his suspicion was confirmed when he observed three children of a family fall ill to scarlet fever, while the eldest daughter, who happened to be taking *belladonna* for another complaint, remained untouched by the epidemic that surrounded her, even though she was usually the first in her family to be infected by a contagious disease. After prescribing the remedy to the five other children in the family as a precautionary measure, a dose which they repeated every seventy-two hours, they all remained well throughout the entire epidemic, without the slightest indication of the disease. Acknowledging that these observations needed to be further corroborated before any firm

conclusions could be drawn, Hahnemann called on others to test his hypothesis carefully and impartially and to refrain from hastily discrediting it with the slightest counterevidence. Echoing Jenner's sentiments, he writes, "I should esteem myself happy if I should see, some years hence, this scourge of mankind in any measure diminished by my labours" ("Cure and Prevention of Scarlet Fever" 370).

Despite his early hopes that *belladonna* would, like cowpox, significantly reduce the incidences of a potentially dangerous and contagious childhood disease, Hahnemann's reported observations were met with considerable skepticism. His attempt to distribute the remedy to subscribers who paid in advance for his observations "On the Cure and Prevention of Scarlet Fever" subjected him to accusations of being a mercenary that would follow him for years to come (Jütte 17). Adding to the controversy, Hahnemann recommended a diluted—or, more precisely, a potentized—form of *belladonna*, which could not possibly have a biochemical effect—an aspect of homeopathy that remains contentious to this day.¹¹⁴

In defense of his recommendation, in an essay "On the Power of Small Doses of Medicine" Hahnemann argued that the pertinent question was not, as skeptics suggested, "what effect *can* 1/100 000th part of a grain of *belladonna* have?" but rather, "what effect *has* 1/100 000th part of a grain of

¹¹⁴ For a summary of the controversy surrounding the dilution of homeopathic remedies and pertinent scientific studies, see Jacobi, "Der Hochpotenzstreit," and *Der Hochpotenzstreit von Hahnemann bis Heute*. See Kuzniar's "Romantic Vitalism" for a fascinating review of how Hahnemann's use of potentized remedies reveals his romantic influences.

belladonna?" (385-86; my emphasis). Submitting the question to medical observation, Hahnemann acknowledged that a dry pill of extract of *belladonna* would usually not produce any effect on a perfectly healthy countryman or laborer, but that this by no means meant that the same dose would be too weak if the same man, or a similar man, was ill (or if the grain was given in a solution). He cites examples of individuals who are sick or predisposed to sickness reacting with extreme sensitivity to food, drink, or medicine that they would not exhibit in a state of health:

What an enormous quantity of freshly made soup it would take to excite a healthy stomach to violent vomiting! But look, the patient ill of an acute fever does not require a drop for this purpose; the mere smell of it, perhaps the millionth part of a drop, coming in contact with the mucous membrane of the nose, suffices to produce this result (388).

Stating what he considers to be a self-evident principle of medical practice, Hahnemann argues that if, excepting himself, no other physician has ever observed the remarkable action of *belladonna* (or of other medicines) in minute doses, it is, in part, due to the fact that physicians' ignorance of the dynamic action of medicines prevents them from designing such experiments (387). For Hahnemann, it was obvious that an organism's inner disposition altered its receptivity to the environment and, in turn, that its receptivity to the

environment altered its inner disposition. He accordingly interpreted varying reactions among individuals exposed to the same disease or remedy as evidence that disease is a function of dynamic interchange rather than the result of mechanical causation. In short, his method of observing symptom formation as a process elicited by potentized remedies both reinforced and was reinforced by his dynamic understanding of disease etiology. And he was keenly aware that a materialistic or mechanistic conception of disease would preclude the kind of observation necessary to draw the conclusions that he drew.

Rather than deny individual nuances by generalizing a standard response across the population, Hahnemann's method was developed in light of these fundamental differences. In the prevention of scarlet fever, for example, the homeopathic dilution of *belladonna* was designed to alter the receptivity of an organism that is susceptible to contagion by scarlet fever and, insofar as *belladonna* produces a similar, artificial disease, is responsive also to its action. As Hahnemann acknowledges, if a healthy labourer is not susceptible to the disease, the remedy will have no effect. In other words, the remedy is prepared in such a way as to not have an effect on an organism unless it is well-indicated.

Refusing to posit uniformity or necessity in the distribution of disease, and then account for exceptions, Hahnemann instead based his approach on the infinite variability of health and disease and the irreducible singularity of an

organism's interaction with its surroundings. In the *Organon*, for example, it is in view of the fact that exposure to disease cannot produce illness in every one, nor at all times, that Hahnemann expresses his preferences for the use of remedies over inoculated disease material in introducing artificial disease to an organism: he finds the living organism to be much more disposed to, and to have a greater chance of being affected by, medicine than by infectious agents (§31; 32). From this perspective, his preference for using homeopathic remedies over inoculated disease material as a prophylactic measure was informed not only by his interest in reducing the risks of medical intervention, but also in enhancing its efficacy. After all, the fact that certain people may not be susceptible to a certain disease at a certain time accounts not only for the fact that some resist illness during an epidemic, but also for the fact that some resist the deliberate injection of disease material, that is, that some fail to respond to immunization. While the problem of failed and waning immunity was suppressed by risk analysts who were concerned that this element of uncertainty would compromise people's willingness to assume the risks of immunization, Hahnemann's prophylactic methods allowed for a diversity of responses to treatment. Rather than deny the singularity of an individual's response to both disease and medical intervention, the efficacy of homeoprophylaxis was explained explicitly in terms of an individual's unique susceptibility.

Finally, while I have emphasized the way in which Hahnemann's respect for individual variation coincides with his ethical commitment to first do no harm, it is important to recognize how it also follows from his distinctly romantic capacity to observe organisms as differentiated unities, *even at the level of the population*. In section 102 of the *Organon*, he demonstrates his capacity to extend the method of observing the totality of symptoms in individual organisms to the community as a whole in the general instructions he provides for selecting a homeopathic remedy for epidemics. He advises that, although all those infected by an epidemic disease are infected with the same disease,¹¹⁵ the entirety of the disease and the totality of its symptoms cannot be observed in a single individual patient. In order to select the appropriate homeopathic remedy to both prevent and treat the epidemic disease, he instructs, it is necessary to observe its manifestations in several patients of different physical constitutional. That it, it is only by observing the myriad, differentiated, expressions of an epidemic disease that one can ascertain its unity as a distinct, remedial, entity. By extension, it is only by observing the multiplicity of individuals in their irreducible singularity, that one can effectively address community health.

Hufeland's Reception of Homeopathy

Hahnemann's method of preventing epidemics without abstracting the

¹¹⁵ Note, he does not say that the different *manifestations* of disease observed in different patients are in fact different *diseases*.

community from the multiplicity of individuals that comprise it proved to be effective. Although his effort to prevent scarlet fever with the prophylactic administration of *belladonna* is most often remembered for the initial controversy it sparked, the efficacy of his method was later confirmed by numerous physicians. In 1807, six years after Hahnemann first published his observations, Hufeland called on doctors and non-doctors alike to report their findings on using *belladonna* to prevent scarlet fever („Anfrage an Aerzte und Nichtärzte über das Hahnemannsche Präservatif gegen das Scharlachfieber“). He asserted that when a respected doctor like Hahnemann believes to have found an effective strategy for preventing a virulent disease like scarlet fever, which Hufeland believed to have taken the place of smallpox in terms of its seriousness, the entire medical community should be attentive (162). Based on his experience of the protective properties of cowpox against smallpox, Hufeland was convinced that it was possible to alter the susceptibility of an organism to a specific contagious disease by qualitatively altering the receptivity of the organism (die „Aufhebung der Empfänglichkeit des Organismus“) (162). He found it highly probable that the protective mechanism operative in vaccination could be extended to infectious diseases other than smallpox and found no reason to doubt that a remedy could alter the susceptibility of an organism as effectively as inoculation with disease material derived from animals (163). In view of its potentially far-reaching implications for public health, he regretted that Hahnemann had received so

much grief regarding his use of small doses, and reminded physicians that this practice was based on many years of studying the effects of medicinal substances on human organisms. He considered the criticisms to be unscientific, and reinforced Hahnemann's call to other physicians to observe the effects of diluted *belladonna* rather than preclude their possibility. For his part, Hufeland had witnessed entire regions spared from infection where Hahnemann's recommendations had been followed, and took it upon himself to report his observations in an unbiased way that urged other physicians to follow suit (164).

Over the course of twenty years, Hufeland collected responses from physicians and published them in a book, *The Protective Power of Belladonna against Scarlet Fever Subjected to Further Examination (Die Schutzkraft der Belladonna gegen das Scharlachfieber zu fernerer Prüfung aufgestellt)*.¹¹⁶ Dr. Düsterberg from Warburg, for example, reports that, having administered *belladonna* during three outbreaks of scarlet fever, he was convinced that, even if it did not provide complete protection, that its prophylactic powers were as reliable as those of vaccination (78-9). Drawing on seven years of clinical experience, Dr. Muhrbeck from Demmin similarly compares the protective action of *belladonna* against scarlet fever with vaccination against smallpox, though he speculates that the former is probably of much shorter duration

¹¹⁶ According to Ameke, Dr. Jani of Gera was the first to write about Hahnemann's remedy and prophylactic for scarlet fever, *Belladonna*, concluding as early as 1800 that although it provided good results in several cases, it was not an unconditional prophylactic. Jani reasoned that Hahnemann's observations may have been made under more favourable conditions (175).

than the former (68).

In view of the extensive corroborating evidence that he received, Hufeland concluded that *belladonna* has the power to protect an organism from scarlet fever, albeit not absolutely—as nothing in medicine is absolute—but with conditions and exceptions (224). At the time that he published his study, he acknowledged that the duration of protection offered by *belladonna* had not yet been measured and found it unreasonable to assume that it would be lifelong, but that even protection during a single epidemic would be valuable for humanity (218). In his opinion, the fact that the efficacy of the remedy had so many confirmations and, more importantly, that it in itself did not risk harming the organism, made it advisable for physicians to use it every time there was a danger of infection, especially in the case of particularly dangerous epidemics. Even in the case of relatively mild outbreaks he recommended its use, since an individual's unique disposition can transform a harmless disease into a very malignant and dangerous case (98). He reasoned that otherwise it would be difficult for a physician to avoid the burden of knowing that he had not done everything in his power to prevent a potentially life-threatening disease,¹¹⁷ a consideration that has significantly different implications when the prophylactic method does not itself introduce an element of harm.¹¹⁸

¹¹⁷ “*Du hättest vielleicht dieses Unglück verhüten können. Du hast wenigstens nicht alles, was in deiner Gewalt war, gethan, um es zu verhüten*” (226).

¹¹⁸ According to Kuzniar, despite his early support of vaccination, “Hufeland himself was later to recommend against the smallpox vaccination because it represented to him an invasion of the body's integrity” (*Birth of Homeopathy*, Ch. 3, location 2722, par. 61).

In view of the documented success of *belladonna* in preventing cases of scarlet fever, in his essay on homeopathy and its place in a rational system of medicine, Hufeland identified the task of discerning specific remedies for various contagious disease as the most important work that homeopaths could pursue (12; 44). Although he ultimately rejected Hahnemann's attempt to replace the existing system of medicine with a new remedial system based exclusively on the law of similars, Hufeland acknowledged the importance of the homeopathic method within the wider context of a rational medical system. His own observations had convinced him that homeopathy is sometimes highly remarkable and has offered effective relief even when other, more invasive, methods have proven to be ineffective (16-17). He recognized in the principle of similars an effective method of addressing disease and found it indisputable that Hahnemann's method of observation had offered new insight into the deep inner workings of the organism, which helped carry this principle—as old as medicine itself—further. Most importantly, he celebrated Hahnemann's development of administering remedies in accordance with the law of similars in a way that never directly harmed the organism.¹¹⁹

Largely unacknowledged in the history of medicine, Hufeland's endorsement, albeit qualified, of homeoprophylaxis points to an alternative development than that offered by the modern uptake of vaccination. It represents a true alternative insofar as the generalization of risks across the

¹¹⁹ To read more about Hufeland's ambivalent reception of homeopathy, see Saeger, *Über: Die Stellung Hufelands zur Homöopathie* and Thoms, “Konfliktfall Homöopathie. Die klinischen Versuche zur Prüfung des Wertes der Homöopathie beim Militär und in der Berliner Charité 1820 bis 1840.”

population, operative in the distribution of vaccination, is precluded by an approach to life that acknowledges the irreducible singularity of an organism's interaction with its environment, follows the medical maxim of non-maleficence, and, by extension, does not violently abstract the health of the community from that of its members. By pursuing the possibility that a medical intervention can effectively prevent infectious disease without introducing risk to the very lives in need of protection, this untold chapter suggests a new way of understanding biopolitics. It is a story that prompts us to consider the possibility that the paradox at the heart of biopolitics—the fact that our efforts to promote life often endanger it—is in fact historically contingent.

Conclusion: A Conscientious Objection

Before 'conscientious objection' acquired its contemporary meaning as the right to refuse conscription to the military, the term was originally applied to those who resisted mandatory vaccination (Durbach Introduction, location 302, par. 20). But its extended use in the context of war remains apt.¹²⁰ In both cases, the objection is issued in an effort to disengage from a war waged by others against a perceived enemy. While there were usually allowances made for medical exemptions, those who otherwise refused their responsibility to the public have historically been criticized by government officials and subjected to significant public pressure. Regardless of the particular nuances of their arguments, “nay sayers” continue to evoke hostility insofar as they are thought to benefit from the sacrifices of others without themselves contributing to the social good. What “reason” can there possibly be to remain under the shelter of homeland security without actively defending the front lines?

The most compelling reason, I find, is that the current strategies of war may not actually protect us. Although I can sympathize with the righteous indignation that arises in response to the free-rider phenomenon, I contend that in the case of conscientious objection, this reaction misses the mark

¹²⁰ In making this assertion, I clearly part ways with Susan Sontag's response to the militarization of medicine as a uniquely destructive metaphor and corresponding call to “Give it back to the war-makers” (95). Though I am equally, if not more, critical of approaches to health that initiate a defensive attack on pathogens, thus turning the body into a battlefield, I adamantly do not agree that this problem is best addressed by changing our metaphors. On the contrary, I contend that such an approach threatens to obscure our capacity to recognize militaristic approaches to medicine as such and, by extension, to dismantle the epistemological and ontological assumptions that inform them. I accordingly find it much more fitting to use militaristic language to describe militaristic approaches to disease.

insofar as it fails to recognize that the conviction that “war is not the answer” is not only a declaration of conscience but also a serious critique of what does not work (Wallis).¹²¹ While it may well be that certain “conchies” are motivated by cowardice rather than nobility and that certain vaccine refusers are secretly trying to enjoy a free ride under the pretense of political activism, an important critical perspective is lost when our debates center on either pointing out or defending such apparent hypocrisy. Stated otherwise, the categorical criticism of all those who resist enlistment into a war of uncertain efficacy fails to sufficiently question whether the collective action from which some wish to exempt themselves in fact generates a social good.

In the case of immunizing communities, the observation that we may actually need continual exposure to pathogens in order to build robust immunity is a humbling one. It points to the hubris of the modern quest for immunity, which denies the essential symbiotic relationships through which we acquire our strength. And it provides a vivid example of the fact that, however vigilant we may be, engaging in a state of perpetual war often does little to protect us from the declared enemy. As German romantic physicians were keenly aware, the preservation of life requires ongoing exposure to challenging stimuli.

If the smallpox eradication campaign is any indication, even annihilating

¹²¹ As Cooper observes, “In the year 2000 the World Health Organization (WHO) officially announced that the truce [with pathogens] was over: the return of infectious diseases worldwide represented a deadlier threat than war; we had been caught off guard; the microbes had been preparing an underground counter-resistance just when we thought we were finally safe” (115).

an infectious disease by interrupting all possible paths of transmission does not thereby render a population invulnerable.¹²² As evidenced by the bioterrorism threats that emerged after the WHO declared the eradication of smallpox, it is precisely *because* a disease is no longer in circulation that the population is rendered especially susceptible to infection. While the smallpox incident is often referenced to highlight the ways in which, in a state of war, medical advances are often perverted to destroy rather than preserve life, it also points to another paradox, one inherent in the efficacy of all mass vaccination campaigns: when a disease is no longer in circulation, a population can no longer build immunity to it.

As Claire-Anne Siegrist explains, the long-term protection associated with live attenuated viral vaccines, such as measles, rubella, and varicella vaccines – which are considered to be prototypical inducers of lifelong immunity – is derived in part “from the induction of sustained antibody responses, which, however, tend to slowly decline in the absence of recurrent exposure and might eventually result in a growing proportion of seronegative vaccinated young adults, including women of childbearing age” (26). In other words, the capacity for vaccinations to provide longterm protection is

¹²² The smallpox virus, widely thought to have been eradicated worldwide through vaccination, is now known to exist in only two laboratories: one in the United States and one in Russia. While the World Health Organization has set a number of deadlines for the destruction of these stores, neither country has complied. As Biss observes: “Smallpox has now ceased to be a disease and is only a potential weapon. And even if the last stores are destroyed, it may remain a weapon. There is plenty we do not know about smallpox, including why it is such a virulent disease, but we know enough, in theory, to resurrect it in a laboratory” (Biss 86). For a detailed account of the campaign to eradicate smallpox and the threat of bioterrorism, see Henderson, *Smallpox*.

compromised by the efficacy with which they interrupt the transmission of pathogens. This synergistic relationship between disease circulation and immunity gives literal meaning to the observation that “vaccines are the victims of their own success.” While this truism is often repeated to lament the fact that vaccine *compliance* decreases when vaccines effectively reduce the incidents of infectious disease such that people are no longer willing to assume the risks of vaccination, the fact that vaccine *efficacy* also decreases is often overlooked.

But a recent resurgence of vaccine-preventable diseases in populations with high vaccine coverage has raised critical questions about the impact that waning immunity has on generating problematic patterns of susceptibility in the population. Back when diseases still circulated freely, individuals who enjoyed “lifelong” immunity not only survived their own bout of disease; they were also continually re-exposed whenever another epidemic broke out. And in larger cities where the disease was endemic, exposure was constant. In contrast, the “quasi-sterile epidemiological situations” manufactured by the “extinction of smallpox and attempts to eradicate measles virus or poliovirus” actually “increase the risk of outbreaks, be it by mutational selection or biological warfare. Under such conditions, unhindered reemergence of old pathogens could be like the first smallpox encounter in Europe during the fourteenth century” (Navarini et al. 115): in a word, devastating.¹²³

¹²³ In *Society Must be Defended*, Foucault presents human intervention in the circulation of viruses as a paradigmatic example of biopower's unbridled capacity for widespread destruction. More specifically, he warns that such an “excess of biopower”:

This unintended consequence of mass vaccination is brought to the fore in a paper by epidemiologists J.M Heffernan and M.J Keeling, in which they examine the “Implications of Vaccination and Waning Immunity.” Heffernan and Keeling incorporate the relatively recent immunological postulate that “the continued lifelong immunity observed for many diseases could be the product of waning immunity and immune boosting through continued exposure to infection” (2071) into their calculations of the outcomes of mass vaccination programs. More concretely, they reason that “in the absence of vaccination, lifelong immunity is maintained through frequent encounters with infection, which acts to boost the waning immune memory However, when vaccination is introduced the prevalence of infection declines, which in turn reduces the amount of boosting and hence the level of immunity” (2078). With this immunological insight, they remain in agreement with previous epidemiological models that vaccination will likely reduce “the number of newborn susceptibles and hence should have some of the usual public-health benefits reducing the number of cases in young children” (2076). However, they also warn that “this reduction in cases will lead to a reduction in boosting and therefore a greater susceptibility to infection in older age classes” (2076). Aware that “vaccination can have a range of unexpected consequences,” they predict that “after a long disease-free period, the

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 cannot be controlled and that are universally destructive. This formidable extension of biopower, unlike what I was just saying about atomic power, will put it beyond all human sovereignty (254).

introduction of infection will lead to far larger epidemics than that predicted by standard models” (2071).¹²⁴

In view of the fact that the decreased circulation of viruses achieved by mass childhood vaccination can actually increase susceptibility in certain populations to the re-importation of such diseases, the most commonly proposed solution is simply to vaccinate and revaccinate more people, earlier and more often. While early supporters of immunization were concerned that instances of infection in 'immunized' individuals could be used to discredit the procedure's efficacy, the widely acknowledged fact of imperfect immunity is today used not to undermine mass immunization, but to defend it.

Summarizing this argument, Biss acknowledges that any given vaccine can fail to produce immunity in an individual and that some vaccines are less effective than others. But, she insists that “when enough people are vaccinated with even a relatively ineffective vaccine, viruses have trouble moving from host to host and cease to spread, sparing both the unvaccinated and those in whom vaccination has not produced immunity” (22). After all, when the observation that vaccine-induced protection can fail or wane is considered in view of the indirect protection that vaccines provide, “mass vaccination becomes far more effective than individual vaccination” (22). In

¹²⁴ In the case of measles, although routine infant vaccination initially achieved a dramatic reduction of the disease in all countries where programs had been implemented, in recent years, measles has made a comeback in populations in which effective vaccination programs have been in place for decades: the United States of America, Australia, England, Germany, and other European countries. This resurgence has prompted researchers to revise estimates of the vaccination coverage needed, to prevent the virus from circulating, to more than ninety-four percent of the entire population (Holzmann et al. 204-05).

short, the fact that vaccines do not always convey full or lasting immunity is all the more reason for everyone to opt for this prophylactic method.

The urgent need to meet and maintain sufficient levels of herd immunity is especially emphasized in response to newly vulnerable, yet vaccine-ineligible, segments of the population, namely infants and pregnant women. While these demographics were once typically immune to the “childhood diseases” of the past (either through previous exposure or protective antibodies provided by their mothers), by effectively delaying disease susceptibility until adulthood, mass childhood immunization has produced a generation of vulnerable women with insufficient antibodies to protect their young.¹²⁵ As Gans and Maldonado explain, the titers of passive antibodies transferred from a mother to her infant are, in part, determined by the number of antibody titers present in the mother during pregnancy, which is typically lower in vaccinated mothers than in those who acquired immunity to the natural disease. As a result, vaccine-induced protective antibodies have been shown to wane earlier in infants as compared to the protective antibodies derived from maternal natural infection (1). In other words, there is an “evolving susceptibility of young infants in highly vaccinated populations to some vaccine-preventable diseases” (2). Since live-attenuated viral vaccines are not usually recommended for either pregnant women or young infants, the

¹²⁵ See Waaijnenborg et al., “Waning of Maternal Antibodies Against Measles, Mumps, Rubella, and Varicella in Communities with Contrasting Vaccination Coverage” and Gans and Maldonado, “Loss of Passively Acquired Maternal Antibodies in Highly Vaccinated Populations: An Emerging Need to Define the Ontogeny of Infant Immune Responses.”

most commonly proposed solution to this vaccine-generated problem—within the paradigm of vaccination—has been to strive for higher vaccine coverage in order to indirectly protect mothers and their newborn children through the herd effect.

In some cases, mass childhood immunization is premised first and foremost on the goal of reducing the circulation of diseases throughout the population, rather than on protecting children from diseases thought to put them especially at risk. In the case of rubella, for example, children are routinely vaccinated against this disease even though it is not considered dangerous for their demographic. Rubella is, after all, a “mild infection” and “once you've had the disease, you're usually permanently immune” (Mayo Clinic Staff). Why not, then, simply allow this mild disease to circulate, so that children can contract it at a time when complications are minimal, and develop lasting immunity? The reason, we are told, is that, because of the indirect action of vaccination, mass childhood immunization against this disease can protect pregnant women and their unborn children, who are themselves vaccine-ineligible. Although rubella presents children with little risk of complications, the consequences of contracting this disease during the first trimester of pregnancy can be very severe for the fetus: up to ninety percent of infants born to mothers who contract rubella during the first twelve weeks of pregnancy develop congenital rubella syndrome, the symptoms of which include growth retardation, cataracts, deafness, congenital heart defects, and

mental retardation (Mayo Clinic Staff). For pregnant women who have not developed natural immunity before reaching childbearing age, and who are susceptible to infection due to the waning efficacy of their childhood vaccines, vaccination is no longer a viable option. Live-attenuated viral vaccines are, as previously mentioned, usually contraindicated during pregnancy. And so, within the parameters of protection provided by vaccines, they have no recourse but to rely on the protection of those around them.¹²⁶ Yet even within the logic of risk analysis this remains a problematic strategy. As Beck observes, “Risk acceptability depends on whether those who carry the losses also receive the benefits” (“Interview” 101).

In this way, the decision to be vaccinated or to have one’s child vaccinated is often regarded as an act of altruism, since an individual assumes the risks of vaccination not only for one’s own protection, but also, sometimes primarily, for the benefit of more vulnerable members of the community. As Biss explains, herd immunity operates on the basis of enlisting the majority to protect the minority, that is, the portion of the population that is particularly vulnerable to a given disease but may not be eligible for

¹²⁶ It should be noted that it is unclear whether mass childhood immunization against rubella can in fact reduce incidents of congenital rubella syndrome. See Klock and Rachelefsky, “Failure of Rubella Herd Immunity During an Epidemic.” This study outlines an incident that occurred in 1970 in Casper, Wyoming, where elementary-school children were vaccinated *en masse* against rubella. Notwithstanding the good intention that motivated this public health initiative, namely to protect pregnant women and put an end to congenital rubella in the community, nine months after this local campaign, an outbreak of rubella hit Casper, involving more than one thousand cases and reaching several pregnant women. Unable to explain why the expected herd immunity effect did not materialize, the perplexed authors concluded that “[t]he concept that a highly immune group of prepubertal children will prevent the spread of rubella in the rest of the community was shown by this epidemic not always to be valid” (71).

protection: “The elderly, in the case of influenza. Newborns, in the case of pertussis. Pregnant women, in the case of rubella” (Biss 30). Biss accordingly encourages us to imagine the action of a vaccine not only in terms of how it affects a single body, but also in terms of how it impacts the collective body of the community. From this perspective, she considers vaccination “as a kind of banking of immunity. Contributions to this bank are donations to those who cannot or will not be protected by their own immunity” (22).

The ethical position that Biss describes is no doubt a compelling one. But it fails to address the ways in which the indirect action of vaccination – which she celebrates for its potential to *protect* susceptible individuals – also inadvertently *produces* new pockets of vulnerability. Identifying some of the disadvantages of establishing herd immunity, Fine et al. note that

[m]easles and mumps outbreaks among university students, and pertussis in adults, are among examples of the consequences of accumulation of susceptible individuals who have not been [or are no longer] protected by vaccination, and escaped infection because of a herd immunity effect earlier in their lives (915).

They also acknowledge that, in some cases, by delaying infection until a later stage in life, mass childhood immunization can lead to serious complications that affect not only older populations, but also their offspring. This is especially

apparent in the case of rubella, which has its most severe consequences in the first trimester of pregnancy. “In at least one instance,” Fine et al. note, “herd immunity and associated delays in infection of unvaccinated individuals led to increased congenital rubella syndrome” (“Herd Immunity” 915).¹²⁷ Similarly, Gans and Maldonado identify “the emergence of measles susceptibility in young infants living in highly vaccinated populations” as an unexpected and paradoxical consequence of “the success of the measles vaccine programs” (1). It was, after all, with the explicit intention of maintaining herd immunity against measles that communities inadvertently increased the susceptibility of newborns to this disease and, by extension, the risk of disease transmission in highly vaccinated populations (Waaijenborg et al. 10). More specifically, by effectively interrupting the circulation of the measles virus, mass childhood immunization campaigns also reduced the supply of protective antibodies that mothers could pass on to their young,¹²⁸ a population in which complications from this disease are considered most life-threatening.¹²⁹ Or in other words, it is a “minority” population that the “majority”

¹²⁷ See Panagiotopoulos et al., “Increase in Congenital Rubella Occurrence After Immunisation in Greece: Retrospective Survey and Systematic Review.” For a more recent account of a similar phenomenon in Japan, see Kinoshita and Nishiura, “Assessing Herd Immunity Against Rubella in Japan: a Retrospective Seroepidemiological Analysis of Age-Dependent Transmission Dynamics.”

¹²⁸ This is a widely documented phenomenon. See, for example, Balé et al., “Risk Factors for Measles in Young Infants in an Urban African Area with High Measles Vaccination Coverage”; Brugha et al., “A Study of Maternally Derived Measles Antibody in Infants born to Naturally Infected and Vaccinated Women”; De Serres et al., “Passive Immunity Against Measles During the First 8 Months of Life of Infants Born to Vaccinated Mothers or to Mothers who Sustained Measles”; Haney, “As Vaccinated Girls Group Up, Their Babies Face Higher Risk for Measles”; Papania et al., “Increased Susceptibility to Measles in Infants in the United States”; Szenborn et al. “Passive Acquired Immunity Against Measles in Infants Born to Naturally Infected and Vaccinated Mothers”; and Zhao et al., “Low Titers of Measles Antibody in Mothers whose Infants Suffered from Measles Before Eligible Age for Measles.”

¹²⁹ Globally, measles remains the leading cause of vaccine-preventable childhood mortality, with 164

should be enlisted to protect.

In view of its unforeseen consequences, the ethics of building herd immunity acquires a new layer of complexity. Insofar as vaccination has an indirect effect on others by interrupting the circulation of pathogens, from which perspective do we designate it as “good”? What is our basis for celebrating those who assume the risks of vaccination for the benefit of the whole as “altruistic?” If we do in fact build immunity through episodes of waning immunity and reinfection, why do we not rather fault them for contributing to problematic patterns of susceptibility and for pushing relatively benign childhood diseases into life stages in which complications are most severe? Conversely, why do we not express our gratitude to those who, by assuming the risks of natural infection, help keep the virus in circulation and so contribute to more stable, predictable, patterns of herd immunity?

As these questions indicate, implicit in our assessment of the decision to either contribute to vaccine-induced herd immunity or not is another, often unacknowledged, evaluation: whether or not doing so constitutes a social good. Does reducing the circulation of pathogens through mass immunization foster the health of communities or does it inadvertently increase our vulnerability? Should we continue to invest in this strategy or would we benefit, collectively, from an approach that promotes coexistence with pathogens? How might our response to infectious diseases change – how

000 deaths annually and the highest fatality rates occurring during the first year of life (Gans and Maldonado 2).

might we change – if we pursued ongoing exposure as the basis for robust immunity rather than limit or eliminate the circulation of diseases that threaten us? The fact is that we simply cannot anticipate all of the long-term consequences of mass childhood immunization. And, in view of the inevitable uncertainty surrounding our public health interventions, I propose that our responses to ever changing patterns of susceptibility would be more constructive if they centered on continually revisiting this fundamental question – do our existing strategies of preventing infectious disease (still) constitute a social good? – rather than on immediately ostracizing voices of dissent as if they unequivocally threaten the health of the community.

As Cohen reminds us, “[r]esisting biomedical explanations and protocols. . . does not necessarily indicate 'wrong, immoral, [or] indefensible ideas' . . . but may reveal a fundamental value conflict that bioscience obscures when it declares its own universal validity” (241). And, as evidenced by the divergence between Hahnemann's method of preventing epidemics and the modern trajectory of vaccination, what begins as a fundamental difference in epistemological and ontological commitments can ultimately give rise to a difference in medical intervention. Although Hahnemann agreed with the early observation that the inoculation of cowpox prevented smallpox, his core values prompted him to develop an alternative to the practice of indiscriminate immunization. More specifically, his commitment to the medical principle of non-maleficence and his attention to an organism's receptivity to

its environment compelled him to respond to infectious disease in a way that did not impose harm and that was sensitive to an organism's unique susceptibility. Similarly, while contemporary scientists, doctors, parents, and policy-makers may reach a consensus on the details surrounding changing patterns of susceptibility among vaccinated populations, diverging value systems and philosophical commitments will invariably generate a plurality of responses.¹³⁰ I believe that when we fail to explicate the underlying assumptions involved in competing responses to infectious disease, we end up engaging in divisive conflicts rather than assessing whether or to what extent a proposed solution corresponds with our shared commitment to promote community health. When we approach the unforeseen, paradoxical consequences of vaccination, for example, as a necessary feature of all interventions into life rather than as the result of a particular set of epistemological and ontological commitments, we undermine our capacity to find innovative solutions to the problems that we have, whether directly or indirectly, collectively generated.

Pointing to some of the promising aspects of living in a risk society, Beck identifies its democratizing potential. Indeed, the upshot of the fact that infectious disease affect us all and that our individual responses indirectly affect the health of others, is that all voices should be involved in the decision-making process. Beck is confident that under the dictates of necessity, people

¹³⁰ That is, of course, only if we interrupt the tendency to only ever pursue path-dependent behaviours in the face of uncertainty.

have passed a kind of “crash course” in the contradictions that arise in a risk society: “on the arbitrariness of acceptable levels and calculation procedures or the unimaginability of the long-term consequences and the possibilities of making them anonymous through statistics” (67). In view of the practical expertise that we have acquired as a function of living in a world risk society, he suggests that “with regard to all issues that are central to society, dissenting voices, alternative experts, an interdisciplinary variety and, not least, alternatives to be developed systematically must always be combined” (*World Risk Society* 70). The capacity to survive in a culture of uncertainty, he insists, requires a “willingness to negotiate between different rationalities, rather than to engage in mutual denunciation” (“Interview” 106).

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