The Unwelcomed Traveler:

England's Black Death and Hopi's Smallpox

by

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ABSTRACT

This dissertation analyzes the fourteenth-century English and nineteenth-century Hopi experiences with the unwelcomed traveler of disease, specifically the Black Death and the smallpox outbreak of 1898-1899. By placing both peoples and events beside one another, it becomes possible to move past the death toll inflected by disease and see the role of diseases as a catalyst of historical change. Furthermore, this study places the Hopi experience with smallpox, and disease in general, in context with the human story of disease. The central methodical approach is ethnohistory, using firsthand accounts to reconstruct the cultural frameworks of the Hopi and the English. In analyzing the English and Hopi experiences this study uses the Medicine Way approach of three dimensions. Placing the first dimension approach (the English and the bubonic plague) alongside the third dimension approach (the Hopi and smallpox) demonstrates, not only the common ground of both approaches (second dimension), but the commonalities in the interactions of humans and disease. As my dissertation demonstrates, culture provides the framework, a system for living, for how individuals will interpret and react to events and experiences. This framework provides a means, a measure, to identify and strive for normalcy. There is a universal human drive to restore normalcy after one's world turns upside down, and in seeking to restore what was lost, society undergoes transformation. Disease creates opportunity for change and for balance to be restored. This study concludes disease is a catalyst of change because of how humans respond to it.

DEDICATION

To my mom, Susan Kendall, who taught me to dream big and never give up.

To my cats, Teddy Bear and Jasmine, who traveled the country with me and kept my life interesting.

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Without divine inspiration I would probably have become an astrophysicist, but I fell in love with history and my life took an interesting turn.

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CHAPTER 1

INTRODUCTION

Why study death? This is a question people often ask when hearing about my dissertation research. My answer is simple, I am writing about life – how people survive traumatic events and internal social change. Examples of deadly pandemics litter human history. Pandemics pushed humans and societies to the edge of dissolving social cohesion as death tolls rose and medical knowledge proved impotent to stem the tide of disaster. A human response to the inevitability of the next great pandemic in the twenty-first century is whether we, as individuals and cultures, could survive. In surviving, how would the world and society around us change? In analyzing disease and human responses of the past, my study explores disease as a catalyst of change due to how humans respond to disease epidemics. Historians study change over time and I argue that disease accelerated change as a common denominator even in diverse cultures that have vastly different views on life and death.

It is not a matter of if the world will experience another global pandemic, it is only a matter of when. On 6 December 2013, a two-year old from Gueckedou, Guinea, died of Ebola virus disease.[1] The child's mother, sister, and grandmother died within weeks. Outbreaks of Ebola are periodic but unpredictable, thus these deaths raised concern but not an international response. Depending on response time, location, and other factors, the number of cases and dead range from a handful to several hundred. In January 2014, as the number infected with Ebola grew, no one could predict the scale of the outbreak. In June 2014, as the number of cases and deaths exceeded any previous

[1] Specifically Zaire ebolavirus, one of five Ebola specifies (Zaire, Bundibugyo, Reston, Sudan, and Tai Forest). The mortality rate for Zaire ebolavirus is 70 to 90%.

epidemic, the Ebola outbreak gained international attention. On 8 August, the World Health Organization declared this outbreak a Public Health Emergency of International Concern. As of 25 October, the number of reported cases reached 10,141 and deaths 4,922.[2] Without concerted international efforts and on the ground care, the number of cases may increase to 5,000 per week by the anniversary of patient zero's death.[3] While unlikely to become a global pandemic, the hot spots of the outbreak Guinea, Sierra Leone, and Liberia, whose health infrastructure are inadequate due to prolonged civil wars, will suffer the worst. The experience of the English and the Hopi echo in the Ebola hot zones, demonstrating how even with modern medical advancements, human nature remains constant. Like smallpox and the bubonic plague, Ebola is an unwelcomed traveler. Infectious disease, the unwelcomed traveler, who enters communities unbidden and in its wake leaves destruction, in time can lead to renewal.

Suffering is a universal human experience, yet how people react to trauma occurs within their socio-cultural framework. Decision-making and making the best choices becomes imperative in a crisis. While certain forms of suffering are culturally specific, the sadness of losing a loved one, the pain of disease, and hopelessness of an unstoppable and deadly epidemic cut across cultural boundaries. Survival is not simply about a physical well-being, but mentally, emotionally, and spiritually as well. Survival, as much as is possible for an individual to control emotionally, depends on a person's fortitude, as well as their ability to find hope and purpose within their suffering. If a cultural framework is flexible enough to provide members of a society with an explanation for

[2] World Health Organization, "Ebola Response Roadmap Situation Report Update," 25 October 2014, 1
[3] Dr. Bruce Aylward (World Health Organization Assistant Director - General, Polio and Emergencies), WHO Virtual Press Conference on Ebola response, WHO Headquarters, 14 October 2014

unexpected occurrences, events, and disasters, the society will continue, though the outward cultural expressions may alter. For the English in the fourteenth century, the social structure and social expectations created a stable infrastructure for people, thereby empowering themselves to establish order in their lives while society collapsed or regressed around them. In comparison, the Hopi drew from an external supernatural power to survive and persist with their way of life. For the Hopi in the nineteenth century, their life plan given to them by *Massauw*, the ruler/owner of this world, provided meaning and purpose to endure social upheaval.

The comparative study that follows has four interwoven subjects – the Black Death, the English, smallpox, and the Hopi – that have more in common than one would imagine. In order to understand human responses to disease, I examine and compare two very different case studies of disease and human response. While the fourteenth-century English are quite different from nineteenth-century Hopi their responses to, understanding of, and impact of outbreaks of disease produced social and cultural changes, such as in changes in the balance of power between political, economic, or religious leaders. The bubonic plague and smallpox are also quite different from one another, one a bacterium and the other a virus, but both have a long history of interaction with humans and are both scourges to humanity. Both diseases aided in the advancement of medical knowledge as humans attempt to prevent and treat victims of these diseases. Placing these unlikely case studies together calls for deeper analysis into both the English and Hopi experiences, involving culture, power, emotion, trauma, and the dynamics of change.

A central question to this study is how did a people's response to a deadly outbreak of disease transform their society? Further, how does culture influence the response to disease and guide the changes that may occur in the aftermath? A third overarching question is how did the experience of the English during the Black Death and the Hopi with smallpox fit within the universal human interaction with both diseases? The origin of this study begins with the combination of my background in Native American history and longtime interest in the Black Death. That imported diseases changed the human landscape of the Americas after 1492 is not in question, but how disease reshaped the cultural landscape is a topic not widely discussed outside Native communities or academia. A potential problem of not addressing the cultural consequences of disease on Native peoples alongside the demographic consequences is the assumption that traditional Native cultures are unchanging. The questions I seek to answer have several layers of analysis, such as what do people think about pandemics? How do people survive pandemics? How did pandemics accelerate change and is this actually a good thing?

In Europe, the Black Death marks the transition out of the medieval period to the early modern period. Due to the Black Death's significance as a turning point and a greater potential for reader familiarity, this study includes the history of human and disease interaction. The choice to focus on smallpox took longer to decide. In the end, I selected smallpox, because it is a pandemic like the plague and due to its prominence in human history and the devastating toll it had on the Indigenous peoples of the Americas. In its long history with humans, smallpox has killed more than any other disease. As smallpox can only spread from human to human, an unbroken chain of infection connects

all those infected with smallpox. This study places the Hopi experience with disease in context with the larger human experience. In the end, a comparison study including the plague and smallpox becomes fertile ground for future investigation into the ways disease acts as a catalyst for change within socio-cultural frameworks.

In chapter two I trace the history of *Yersinia pestis*, the bacterium that caused the Black Death. The story of *Y. pestis* begins long before the Black Death, the outbreak that marked the beginning of the Second Pandemic. *Y. pestis* is a bacterium endemic to rodent populations around the world, some hosting deadlier strains than others. As will be discussed, the transmission of the plague to human populations is rare and deadly. The strain responsible for the Black Death is most likely that common to the marmots of the Mongolian Steeps, which has a higher incidents of pneumonic plague.

The story of the Black Death began in China in the 1330s and spread westward into Europe – the migration of people allowed for the movement of disease and the unintentional importation of the plague into areas around Eurasia, to varying degrees. Demographers theorize Europe lost between thirty to sixty percent of its population – figures most likely common for all of Eurasia. People across Eurasia felt the consequences of the Black Death, directly or indirectly. Medieval understandings of the cause of the plague varied greatly, as did people's reaction to the plague during and after. The Black Death was not the only visitation of the plague on the population of Europe, it continued in a cycle of epidemics, visiting a population at least once a generation, until the eighteenth century. The plague did not directly cause the dynamic changes that occurred in its wake. Instead, the plague acted as a catalyst as the population loss and

powerlessness to understand or treat the disease forced society to adapt technologically, politically, and medically in order to effectively deal with the pandemic.

While a culture's reaction to disease can act as a catalyst of change, determining the extent to which this is true becomes more difficult when other agents of change, such as other forms of trauma, are also present. For example, increasing colonization efforts of the U.S. federal government and the growing internal tension within Hopi communities about how to react to the enforced changes overshadows the 1898-1899 smallpox outbreak within these communities. Thus, while the trauma and suffering caused by disease are important to my study, my analysis is not dependent solely on these two agents of change.

How the bubonic plague accelerated change in the social, political, economic, and cultural trends of fourteenth-century England is the focus of chapter three. The strength of one leader and his ability to maintain the loyalty of their people, during a crisis correlates to a population's ability to remain functional and not dissolve into chaos. Fortunately, King Edward III possessed not only effective leadership but also the ability to retain the allegiance of the political and social elites throughout the near entirety of his reign, from 1327 to 1377. Edward III's victories in the opening years of the Hundred Year's War aided in unifying his subjects and giving them confidence in his abilities. Along with Edward III's successful leadership, the social structures of villages and cities provided stability during times of unrest. Villagers, whether free or unfree, were bound to the lord whose land they worked. Furthermore, due to the lack of mobility in the pre-plague years, shared histories of villagers, their roles clearly defined, provided stability – even as it seemed the world was falling apart, everyone knew the duties they were to

perform, including those within their community and families. The strength of managers' leadership of estates also played a role in the continuance of village life even through chaos. This chapter also examines specific ways the plague changed English life, from language to religion to medicine. England lacked a unifying cultural or national identity during these years. The events of the fourteenth century marks the beginning of the development of a shared identity, resulting from the political centralization and unification, which began under Edward III, the final collapse of the feudal system, and increased social mobility and social blending.[4]

In the last thirty years, the amount of scholarship on the Black Death in Europe has developed rapidly, especially as scholars sought to determine the exact origin of the Black Death, whether it was caused by the bubonic plague or another communicable disease.[5] While the details of the narrative changed, the core structure of the narrative remains the same. Typically, a book on the Black Death will begin with explaining what the bubonic plague was, how it spread, and how it killed. The story then moves to how the bubonic plague entered Europe and how it spread outwards from the Italian states to the rest of Europe, examining the accounts of widespread death and panic, the flagellants movement and the genocide of Jewish communities on the continent. The narrative ends with analysis related to the purpose of the text, usually how the Black Death changed the

[4] The island that would one day become England, Scotland, and Wales, underwent many waves of conquest, resulting in a multicultural society even before the Norman Conquest. A result of the Norman Conquest was a replacement of the ruling class, Anglo-Saxons replaced by Normans. A result of this displacement was a cultural divide between the nobility and the commoners. Even today, defining "English identity" is simpler than defining "English culture."

[5] *The Black Death: a Biological Reappraisal*, by Graham Twigg, was the first to suggest an alternative to the bubonic plague; Twigg argued the Black Death was a result of anthrax. Other scholars who reject the bubonic plague and suggest other causes include: Koenraad Bleukx, Samuel Cohen, James Wood, Sucan Scott, Christopher Duncan, Stephen Eil, and Thomas Bulter.

economic, social, political, or cultural structure of a location, country, or continent. The traditional structure of how the narrative is told is not in itself problematic, it is the limited focus on Europe that is, because it reduces the larger, more complex, history of the plague into a Eurocentric account.

While the current trend in scholarship on the Black Death still focuses largely on Europe, or places within Europe, narratives include a more interdisciplinary approach in their analysis. Ole Benedictow's *The Black Death 1346-1353; The Complete History,* following the traditional narrative structure, analyzes regional demographic records and studies to provide a larger detailed overview of the death toll and behavior of the plague, incorporating current medical and scientific research. *The Great Mortality: An Intimate History of the Black Death, the Most Devastating Plague of All Time,* by John Kelly, is similar to Benedictow's work but focuses on the cultural history of the plague, incorporating environmental history and the history of the other plague pandemics.[6] Extremely lacking in the current narrative of the Black Death are studies of the plague's effects outside of Europe.[7] In the chapter I seek to expand the narrative of the Black Death by incorporating recent scientific findings; broadening the coverage of the Black Death to Eurasia; considering the events of the fourteenth century as a whole leading up to the plague; and examining the role of environmental history in influencing the events of the fourteenth century. Instead of stopping my narrative in 1352, I include later outbreaks that were nearly as devastating as the Black Death itself. The chapter's

[6] The Black Death marks the beginning of the Second Plague Pandemic.

[7] Two examples of Black Death scholarship with focuses outside of Europe are Michael W. Dols, *The Black Death in the Middle East* (Princeton: University of Princeton Press, 1977) and Borsch, Stuart J. *The Black Death in Egypt and England: A Comparative Study* (Austin: University of Texas Press, 2009).

purpose demonstrates the complex history of the bubonic plague from the First Pandemic (590-667) to the Third Pandemic (1855-1959), in its movements and how humans understand the disease.

Smallpox has a long story of interacting with humans, for we are its only viable host, thus creating an unbroken chain of infection connecting the first person with smallpox with the last person infected, a period of nearly ten thousand years. Similar to chapter two, chapter four traces the unbroken chain of infection from smallpox's emergence until its eradication as it found its way around the world as humans migrated and interacted with new and non-immune populations. The purpose of this chapter is to place the Hopi and other Native peoples' encounters with smallpox into the larger human story caused by the disease, while also incorporating non-western histories and modern scientific research. The joining of these stories, the impact and reaction, of peoples throughout time does not discount or lessen Native peoples, in the Americas and elsewhere post-1492, experience and suffering, instead, it provides a deeper understanding of the uniqueness of their experience. The final section of this chapter examines in finer detail Native peoples of the Americas' experiences with smallpox with its importation throughout the Americas, with particular focus on today's American Southwest.

The Hopi's first encounter with smallpox is unrecorded whereas government documents and written firsthand accounts record the final major outbreak. The smallpox outbreak of 1898-1899 is the focus of chapter five. Similar to the Black Death, the accounts and voices of the majority of people who lived through this outbreak are inaccessible, at least to a non-Hopi. Furthermore, the trauma of the outbreak is

overshadowed by the Oraibi Split of 1906, where the village Oraibi, disagreed over how to accommodate the U.S. federal government's programs, and divided into new communities. This chapter seeks to show a connection between the smallpox outbreak of 1899 and the Oraibi Split. Similar to how the English changed in the wake of the Black Death, this smallpox outbreak acted as a catalyst and not a causal agent of the split. In order to draw out the Hopi voice and examine events through a Hopi perspective, or at least attempt to reconstruct such, this chapter first explores the fundamentals of Hopi culture, specifically their views on life and disease. While the seed of the Oraibi Split was first planted at the village's founding, the events of the 1890s brought tensions to the breaking point. At the heart of Hopi society and how they survived the events of the 1890s and 1900s, is the Hopi life way, a plan that allows for flexibility in interpretation and stability in purpose. The Hopi experience during these decades, the impact of which the residents of Hopiland still feel, provides a window into the past and how the Hopi responded to the first smallpox outbreak.

To accurately describe the Hopi and their cultural change over time, I must include Hopi viewpoints to construct a Hopi perspective using ethnohistory. I strove to include Hopi voices using government documents, autobiographies, and scholarly works written by Hopi scholars. Therefore, I draw the voices for both the Hopi and the English from written historical documents.

The field of history of disease employs many methods, such as epidemiology and demography. Epidemiology includes the story of the interaction of humans and diseases. Understanding the factors that allowed the bubonic plague and smallpox to spread within populations illuminates the cultural practices that aided in the spread of these diseases, as

well as the practices that underwent transformation, or adoption, in response to epidemics.

In modern scholarship, Native American history is told from a survivor-centered narrative – it privileges the voices, knowledge, and experiences of Native peoples. Current literature produced by Native and non-Native Americans in Native American history demonstrate Native peoples' and cultures' resiliency and adaptability. The themes of resistance, adaptation, and survival permeate scholarship on Native Americans. An example of the use of survivor-centered narrative with respect to Native Americans and disease is *Epidemics and Enslavement: Biological Catastrophe in the Native Southeast, 1492-1715* (2007) by historian Paul Kelton, in which he demonstrated the complex relationship of human interaction with the spread of disease. Kelton's work, and that of other scholars who study the Mississippian shatter zone, also shows how Native peoples of the southeast survived repeated devastating epidemics of disease.[8] Like Kelton, when analyzing the English and Hopi experiences, I seek to use a survivor-centered narrative. In moving passed the victim-centered narrative, it is possible to place Native peoples' experience with disease within the global history of humans and disease.

Alfred Crosby's *The Columbian Exchange: Biological and Cultural Consequences of 1492* (1972) and William McNeill's *Plagues and Peoples* (1976) are both pivotal books in the study of disease and Native American history. Crosby's book is a prelude to the intent of my study. While his title explores biological and cultural consequences, it lightly touches on the cultural aspects in his discussion of the biological.

[8] See Robbie Ethridge and Sheri M. Shuck-Hall, editors, *Mapping the Mississippian Shatter Zone: The Colonial Indian Slave Trade and Regional Instability in the American South* (Lincoln: University of Nebraska, 2009).

While a rich source of inspiration, his book tells only half of the story. Crosby begins his discussion of the first smallpox epidemic in the Americas by stating that this was an epidemic "whose influence on the history of America is as unquestionable and as spectacular as that of the Black Death on the history of the Old World."[9] His recounting of the first smallpox epidemic is indeed as frightening and apocalyptic as retellings of the Black Death of the late fourteenth century, and demonstrates the short and long-term consequences of the smallpox epidemic. Crosby writes, "The psychological effect of epidemic disease is enormous, especially of an unknown disfiguring disease which strikes swiftly."[10] While this statement refers to smallpox, it can also apply to the bubonic plague. Survivors of smallpox bear the scars of their experience, something not previously encountered by the Indigenous peoples of the Americas. Citing both Spanish eyewitness accounts and modern demographers, Crosby states that one-third to one-half of the Indigenous population died during the first smallpox pandemic.[11] These estimates are similar to the estimates for the death toll of the Black Death in Europe, suggesting the widespread and apocalyptic nature of the smallpox epidemic in the eyes of the Spanish, a feeling shared by the Indigenous population. Crosby's focus primarily falls on how disease decimated the Indigenous populations and allowed Europeans to claim dominion – an oft-repeated story. As a survey, Crosby's book is a good starting point, but it leaves the reader with a sense that disease destroyed Native people by toppling empires and decimating villages. Though he takes a long view of history, he misses the larger picture

[9] Alfred Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport: Greenwood Press, 1972), 42.

[10] Ibid., 56.

[11] Ibid., 47.

– for example, while the importation of the bubonic plague toppled Europe, that people of the Middle Ages remembered, it provided a space for change and new growth.

William McNeill's *Plagues and Peoples* (1976) remains a mainstay of disease history. Highly accessible and beautifully written, *Plagues and Peoples* touches on a topic that both fascinates and horrifies us – the role of disease in human history.[12] In McNeill's view, disease is an integral part of human history. McNeill wondered why Cortez was able to conquer the Aztec Empire with less than six hundred men. The answer to this quandary is imported disease and its power to devastate. The strength of McNeill's work is how he places individual group's experience with disease together as the human history of disease – human experience in one area echoes that of another area. Considering the origin of this book, and its purpose, scope, and when he wrote it, certain omissions are perhaps forgivable. McNeill writes the Indigenous people of the Americas' experience from an outsider's perspective with the Indigenous people as the conquered – disease decimated the Indigenous population and Europeans rose to dominance. My study augments McNeill's *Plagues and Peoples* by moving passed this oft-repeated story by telling the other half of the story, namely how Native peoples proactively survived, rebuilt, and adapted to changes introduced by nature and/or other humans.

Scott Rushforth and Steadman Upham's *A Hopi Social History: Anthropological Perspectives on Sociocultural Persistence and Change* (1992) draws from the rich scholarship of Peter Whiteley. Rushforth and Upham argue that cultural systems, traditions, and social norms are the mental framework with which an individual makes

[12] The latest edition of *Plague and Peoples* was published in 2010.

decisions and that which also influences and constrains their behavior.[13] Using this premise, Rushforth and Upham examine several case studies in Hopi history to explore sociocultural persistence and change. Their definition of sociocultural blends the ideas of framework (culture) with human behavior and the structure it creates (social and society).[14] Along with Rushforth and Upham's examination of the Hopi and the Oraibi Split, I make extensive use of their definition of culture in my discussion on cultural response to disease.

Armin Geertz's work on cultural change influences my analysis. Geertz began his research on the Hopi and then widened to the interconnection between cognition, culture, and religion. Geertz examines the four interrelated traditions, or approaches, that he argues dominates Hopi Studies: Evolutionists (Jesse Walter Fewkes), Boasians (Franz Boas, Elsie Clews Parsons, and others), Psychologists (Clyde Kluckholn, Dorothy Eggan, and others), and Social Anthropologist (Fred Eggan, Mischa Titiev, Richard Clemmer, and others). Critics of the approaches of evolutionists, psychologists, and social anthropologists include Edward Spicer, Peter Whiteley, Jerrold Levy, Steadman Upham, Scott Rushforth, and Thomas Hall. Arguably the differences between all approaches in analyzing Hopi cultural change is the degree of Hopi voices included in the analysis. At the end of his analysis of the aforementioned scholars' works and approaches, Geertz's provides his definition, "I hold that persistence and change are aspects of the same social phenomenon, namely, tradition. In order for a tradition to remain viable, it must be resilient on the one hand and malleable on the other. It must change in order to retain

[13] Scott Rushforth and Steadman Upham, *A Hopi Social History: Anthropological Perspectives on Sociocultural Persistence and Change* (Austin: University of Texas Press, 1992), 6.

[14] Ibid., 27.

meaning in the face of changing social and political circumstances" and that a society's core narrative and traditions provide the framework through which people understand and react to current events, in other word, the core narrative is a cultural framework.[15] In analyzing the events leading up to the Oraibi Split, for example understanding of the Hopi life plan and how they interpret it helps to explain the parties involved with the split saw themselves as maintain Hopi ideals. I incorporate Geertz's argument in my analysis as I hold the reactions of both the English and the Hopi are example of cultural continuity and survival.

Of the many peoples who suffered from epidemic diseases, why compare the English and the Hopi? Westerners have a general understanding of how the Black Death changed Europe – socially, economically, and culturally – but often fail to see how disease changed Native peoples. While imported diseases killed upwards of ninety percent of the Indigenous population in the Americas, the impact goes beyond depopulation. By placing both peoples and events beside one another, it becomes possible to move past the death toll inflected by disease and see the role of diseases as a catalyst of change. Furthermore, this study seeks to place the Hopi experience with smallpox, and disease in general, in context with the human story of disease. While the specifics of Native peoples' encounters with imported disease are unique, their overall experience is shared with other peoples throughout time. The introduction of smallpox into a non-immune population causes a severe epidemic with a high mortality rate. The introduction of smallpox into the Americas differs from those of Eurasia due to smallpox

[15] Armin W. Geertz, "Theories on Tradition and Change in Hopi Studies," *Anthropos* Bd. 88, H. 4/6 (1993): 495.

being the frontrunner of waves of imported disease, whose introduction and time between outbreaks prevented populations from recovering.

The perspective used in retelling and analyzing historical events matters. According to Donald Fixico, the western perspective, like the English, is the first dimension in telling and writing Native history. The second dimension in his *Call for Change: Medicine Way of American Indian History, Ethos, and Reality*, is where whites and Native peoples share a history and both viewpoints are expressed. The third dimension is where and how a Native community, like the Hopi, practices a Native ethos and believes in the physical and metaphysical realties as one. Taking the third dimensional approach to Native history is to use the Medicine Way.[16] As Fixico argues, in constructing a Native viewpoint on Native history, to use a Native community as a case study, or view a biography of a Native individual, there are several factors that must be taken into consideration, namely, "Native thinking or thought, cultural values, communal philosophy, Native reality, oral tradition, Native language, and Native worldview or ethos."[17] For my case study of the Hopi and smallpox, in chapter 5, using the Medicine Way approach means my narrative begins, not in the nineteenth century but with the Hopi's emergence into this world, the fourth world, through the *sipapuni*, for the origin and migration stories form the foundation of the Hopi ethos. Placing the first dimension approach (the English and the bubonic plague) alongside the third dimension approach (the Hopi and smallpox) demonstrates, not only the common ground of both

[16] Fixico defines "Medicine Way" as "the Native way of "seeing," or the worldview in an indigenous paradigm, whereby American Indians experience physical and metaphysical realities as one" (xvii). Donald Fixico, *Call for Change: The Medicine Way of American Indian History, Ethos, and Reality* (Lincoln: University of Nebraska Press, 2013), 6.

[17] Fixico, 27.

approaches, but the commonalities in the interactions of humans and disease, such as the acceleration of change, shifting balances of power, trauma, resilience, rebuilding, and more.

Instead of approaching Hopi history from an outside-in approach, or first dimension, I sought, as much as possible for a non-Hopi, to tell their history from a Hopi perspective (third dimension). By deemphasizing the mainstream perspective, the Hopi perspective and interpretation of events comes to the forefront. The practice of writing history from the perspective of the people a scholar studies is taken for granted in field outside of Native American history. For example, would writing from a Scottish perspective of the Black Death in England be possible? Yes, to a certain extent. Would it be accepted and used in other works on the Black Death in England? Not really. Therefore, in order to heed the call for change, my retelling of Hopi and English history is from their own perspectives, demonstrating their cultural responses to disease and the consequences of their reactions on their societies.

England's population of two million, in the wake of the plague, was far more numerous than the Hopi's population of two thousand at the beginning of the twentieth century, but the fundamental effect of disease can be seen in both. Similar to the differences in population size, the length of the outbreak for the Black Death and the smallpox outbreak of 1899 differ, as does the total dead. The Black Death, as discussed in chapter two, was the beginning of a pandemic that lasted centuries.[18] The outbreak of

[18] The Black Death refers to the first few decades (1330s to 1350s) of the beginning of the Second Pandemic, which lasted from the mid-fourteenth century until the early-eighteenth century. The First Pandemic of the Plague occurred from 590 until around 667, typically referred to as the Justinian Plague. Similar to the Second Pandemic, the Justinian Plague burned through the Mediterranean World and into north Europe, killing millions. Arguably, the Justinian Plague aided in the decline of the Roman Empire.

1899 was the last smallpox outbreak amongst the Hopi. Just as the common peasant's experience during the Black Death is not accessible, the Hopi experience with smallpox from the first outbreak to the last is not accessible in both cases, scholars can only conjecture and theorize from the materials available. Due to the trauma of the Oraibi Split, and Hopi beliefs concerning death, it is unlikely for non-Hopis to learn the full experiences of the Hopi during this final outbreak. Another difference between these two cases is that unlike England during the Black Death, the smallpox outbreak did not affect all of the Hopi villages, nor did it directly impact the Oraibi population.

Considering these differences, a comparison study may seem foolhardy, but the differences help to illuminate the similarities of accelerated cultural changes. The Hopi are not a politically unified people; clans, traditions, language, and ceremonies culturally connect them. In contrast, during the fourteenth century England was politically unified but culturally diverse. As it had been since the Norman Conquest of 1086, the power the king of England held depended on his alliances with Lords, Barons, and other nobility. While people may identify as a king's subjects, their identity was largely composed of their role in the village or town they were a part of. In both cases, the decisions of individuals within each village transformed the Hopi and English. A society is composed of individuals, and the shared actions and beliefs of individuals influence overall society, whether the population is in the millions or thousands.

The Third Pandemic, lasting from 1855 until 1959, spread from throughout Indochina, the South Pacific, Australia, and to San Francisco. The discovery of *Y. pestis* led to effective treatments which stopped the spread of the human pandemic. Yersin and Kitasato were leading bacteriologists sent to Hong Kong in 1894, by the French and Japanese governments, to discover the cause of the plague.

There is a mainstream misconception that Native Americans, and other Indigenous peoples, are frozen in time. The research of nineteenth century anthropologists, which still influences modern popular imagination and stereotypes, is a rich resource for scholars as it provides a window into Native American cultures during that period, and continuing research provides a deeper insight into cultural change, adaptation, and resiliency. Unfortunately, too often, the late-nineteenth century descriptions of Native cultures are set as a benchmark for authenticity.[19] Thus the mainstream labels only those cultural traditions, beliefs, and practices seemingly devoid of any outside influence as truly traditional, anything less is devalued as not authentic.[20] This notion is flawed as a living culture is a changing culture. Through interactions with other cultures, ideas, and younger generations, a people incorporate, reject, and reinterpret their own ideas, values, customs, and traditions, adapting to the changes around them, while the heart of their culture remains essentially the same. The choice to place the thirteenth century English alongside nineteenth century Hopi is to demonstrate how a culture changes over time and the factors that influence such change, in this case, disease is the catalyst of change.

This dissertation does not attempt to alter the existing narratives of the Black Death or the Hopi encounter with smallpox. Instead, it aims at using the juxtaposition of

[19] Paige Raibmon, *Authentic Indians: Episodes of Encounter from the Late-Nineteenth-Century Northwest Coast* (Durham: Duke University Press, 2005), 5.

[20] For further reading on this topic I suggest Paige Raibmon, *Authentic Indians: Episodes of Encounter from the Late-Nineteenth-Century Northwest Coast* (Durham: Duke University Press, 2005); Sherry Lynn Smith, *Reimagining Indians: Native Americans through Anglo Eyes, 1880-1940* (New York: Oxford University Press, 2000); Daniel H. Usner, *Indian Work: Language and Livelihood in Native American History* (Cambridge: Harvard University Press, 2009); and Philip Deloria, *Indians in Unexpected Places* (Lawrence: University Press of Kansas, 2004).

these two narratives to tell a new story, focusing on comparison and contrast between the two experiences. Scholarship on England and the Black Death abound and my analysis simply approaches the topic from a different perspective. Secondary sources on the Hopi smallpox outbreak of 1898-1899 are sparse and primary sources are limited largely to U.S. government documents, newspaper accounts, and short mentions in other materials. Yet my argument is the smallpox outbreak influenced the timing of the Oraibi Split in 1906 and, as such, offers new insight into the events leading to the Split.

What makes my study significant is not these individual pieces but the combination of them as a whole. Instead of selecting a comparison study on two Native nations my study cuts across boundaries to compare a European nation and a Native nation. In comparing two dissimilar peoples, the similarities they share become apparent by providing insight into the universal human experience. Readers of my study are likely to be familiar with either the English or the Hopi, most will only have a passing understanding of the history of the bubonic plague or smallpox, so placing the English, the Hopi, the bubonic plague, and smallpox together allows readers to experience the unfamiliar with the guidance of the familiar. Bringing together the familiar with the unfamiliar and expanding upon existing narratives makes my dissertation unique and cross-culturally significant.

CHAPTER 2

THE MIGRATION OF THE BLACK DEATH

The Black Death was a Eurasian pandemic. The oft told story usually begins in 1348 with the plague entering Europe through Genoa. Over the course of four years, the plague spread to every corner of the continent, causing panic and widespread death. Scholars quote, in length, descriptions of the plague from Giovanni Boccaccio and Francesco Petrarch. Mentions of the ethnic cleansing of Jews and the public displays of flagellants are also standard in scholarship on the plague, as are descriptions of fleas and rats. The traditional narrative of the Black Death is limited and Eurocentric in scope. The non-Eurocentric history of the Black Death traces the bubonic plague's migration from the Mongolian Steppe to the shores of England. The inclusion of recent scientific findings, environmental history, and epidemiology adds further depth to the traditional narrative of the Black Death.

The fall of the Western Roman Empire in 476 led to a decline in infrastructure, trade, and urban centers, resulting in the collapse of the trading routes that connected the empire with China. The collapse of the Western Rome Empire limited the extent of Eurasian pandemics within Europe as trade became local or regional. Unlike the western portion, the Eastern Rome Empire remained connected with China and India, and opening it to outbreaks of imported diseases. In the thirteenth century, the *Pax Mongolica* allowed for the reestablishment of Europe's Asian trade routes. The Pax Mongolica was a period of stability brought about by the rise of the Mongolian Empire

that stretched across Asia in the thirteenth and fourteenth century.[21] Mongol control of trade routes through their territory made travel safer and faster on well-maintained roads.[22] Traders preferred overland routes to the sea routes, as the seasonal direction of ocean currents made travel slower. For trade between China and Europe, the preferred routes being along the northern steppe, which skirted Siberia, Mongolia, and northwest China, as the flat terrain made travel easier. These routes crossed through rodent colonies that were, and still are, plague reservoirs.[23] Trade routes transported not only goods and people, but also diseases.

The average medieval village had a population of 500 to 700 people, mostly subsistence farmers. Common in the pre-industrial age, ninety percent of England's population lived in small villages and only about ten percent lived in urban areas.[24] These communities were mainly self-sufficient and relatively isolated from larger cities and other town, but enough for landlords to collect rents from their tenant farmers, but not so close that other villages and cities affected daily life. The amount of resources available limited the population size of a village; in many cases making population growth unwise and impossible.[25] Cities, on the other, depended largely on trade, making population size dependent on the amount of trade and industry it could attract. Crowded

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[21] Ronald Findlay and Kevin H. O'Rourke, "Commodity market integration, 1500–2000," In *Globalization in historical perspective* (Chicago: University of Chicago Press, 2003), 15.

[22] Janet Abu-Lughod, *Before European Hegemony: the World System A.D. 1250-1350* (New York: Oxford University Press, 1989), 158.

[23] John Kelly, *The Great Mortality: An Intimate History of the Black Death, the Most Devastating Plague of All Time* (New York: HarperCollins Publishers, 2005), 33.

[24] Norman J. G. Pounds, *The Medieval City* (Westport: Greenwood Press, 2005), 80.

[25] George Huppert, *After the Black Death: A Social History of Early Modern Europe* (Indianapolis: Indiana University Press, 1998), 1 and 10.

and dirty, large cities were home to many endemic diseases; causing cities' continual existence to depend on migration from rural surplus population. In other words, cities absorbed the overflow from rural areas. Due to this migration, in the aftermath of the Black Death, urban populations rebounded quickly to previous levels and, in the long term, grew, whereas the rural population remained low.

Humans and nature existed in an unsteady balance in the fourteenth century, one that held very little room for population growth or crop failure. The Great Famine of 1315-1317 demonstrated how quickly lean times became starving ones.[26] Yet this period of gradual transition was, in many ways, also a time of stagnation. The bubonic plague descended upon this world of fragile balance, leaving in its wake one of the worst demographic and biological disasters to befall humans.

Humans assume all things have an explanation and the answers they find depend on their starting assumptions. The question "what is the plague" has several answers. Modern medicine says the plague is *Yersinia pestis*, which, in turn, allowed scientists to identify the plague vectors and methods of transmission. Medieval medicine said a miasma, originating from astrological alignments or earthquakes, caused the plague. Medieval man said God's wrath for human sinfulness caused the plague or a poison spread by Jews.[27] Modern man no longer fears the plague, only the illness that will

[26] While the weather that caused the Great Famine ended in 1317, it took a few years for the conditions to return to pre-famine levels.

[27] The medieval world was larger than Europe and contained many diverse non-Christian religions – indeed, Europe itself was a mixture of religions – but for my purposes, I focus on Christian Europe unless otherwise stated.

replace it.[28] Perhaps the modern man's answer to the question of "what is it" is still not as different as medieval man.

The Plague According to Modern Science

The multiple reservoirs of plague-infected rodents (rats, marmots, and prairie dogs, to name a few) around the world, such as the American West, are a result of human and animal migrations.[29] While animals migrate on smaller scales and can spread the plague bacterium into new rodent colonies, humans, in their migration and travel, provide a means for disease to spread on a wider and faster scale than what animals can do alone. Rodents who are host to the *Y. pestis* bacteria have a degree of immunity to the plague, the bacteria and rodents having evolved into a symbiotic relationship over the last 15,000 to 20,000 years.[30] Outbreaks of the plague occur in a population of rodents for the same reasons epidemics occur in a human population – non-immune members enter the community, food shortages, and/or other events introduce stress into a population and thereby weaken the resistance of the whole population. The majority of the plague reservoirs are in isolated areas, such as the American Southwest and Southern Africa, which prohibits the spread of the outbreak to humans. While there are disagreements on the place of origin of *Y. pestis*, scholars generally accept it to be either near the Gobi

[28] New strains of anti-biotic resistant *Y. pestis* has been identified, a reminder that this bacterium still poses a threat to humans.

[29] Ole Benedictow, *The Black Death 1346-1353: The Complete History* (Rochester: Boydell Press, 2006), 46.

[30] John Kelly, *The Great Mortality: An Intimate History of the Black Death, the Most Devastating Plague of All Time* (New York: HarperCollins Publishers, 2005), 36 and 301.

Desert, Yunnan/Burma or Manchurian/Mongolian Steppe region, due to the virulence of the strains found in rodent colonies within these regions.[31]

The rodent associated with the spread of the plague is the black rat, *rattus rattus*, but its presence is not required to spread the plague. The Oriental rat flea, *Xenopsylla cheopis*, is the main vector of the plague, but the presence of an infected flea or rat is not necessary for the introduction of *Y. pestis* into a human or rodent population, as *Y. pestis* can survive in flea droppings and soil, under ideal conditions, for a few years.[32] The hardy flea, *X. Cheopis*, can survive without a host for six or more weeks, allowing *Y. pestis* to spread without the presence of rodents. A flea becomes a potent transmitter of the plague when *Y. pestis* causes a blockage in the flea's stomach system.[33] A blocked flea is a hungry flea and as it feeds, it regurgitates bacteria into its hosts.[34] Its continued blockage leads to the eventual death of the flea. When the bacteria overwhelms the rat's immune system, the rat becomes sick. When a flea's host dies, it jumps to another.

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[31] Using the bacterium's DNA, paleomicrobiologists Michel Drancourt and Didier Raoult have demonstrated the origin of *Y. pestis* emerged from *Y. pseudotuberculosis* about 1,500-20,000 years ago within the plague reservoir of the Mongolian steppe and Gobi desert (Drancourt and Raoult, 106). During the First Pandemic, it is believed the plague arrived through Cairo, suggesting a water route and thus explaining the plague reservoirs in Yemen and Ethiopia (Michael W. Dols, *The Black Death in the Middle East* (Princeton: University of Princeton Press, 1977), 14). Tracking the evolution of *Y. pestis* genotypes and isolates, there is a definite geographic and temporal correlation between those responsible for the Black Death and their geographic spread along the Silk Road (Giovanna Morelli, Yajun Song, Camila J. Mazzoni, Mark Eppinger, Philippe Roumagnac, David M. Wagner, Mirjam Feldkamp et al., "*Yersinia pestis* genome sequencing identifies patterns of global phylogenetic diversity," *Nature Genetics* 42, no. 12 (2010): 1142). The dates of these genotypes appearance on the *Y. pestis* family tree and the outbreak of the Black Death in the fourteenth century occur within about hundred years of one another (Morelli, 1142).

[32] The human flea, *pulex irritans*, may also have had a role in spreading the plague. Also *Nosopsyllus fasciatus* has also been suggested as a possible vector in the Black Death instead of *X. cheopis* (Michel Drancourt and Didier Raoult, "Molecular insights into the history of plague," *Microbes and Infection* 4, no. 1 (2002): 107). Joseph Byrne, *The Black Death* (Westport: Greenwood Press, 2004), 19.

[33] Benedictow, 16. When high amounts of *Y. pestis* enters the flea's system, it is unable to pass it through its stomach system fast enough (see Benedictow for full description), and this is what causes the eventually blockage to occur.

[34] The starving flea eventually dies.

When an isolated population of rodents experiences an outbreak, the flea per rat ratio rapidly increases as the number of available hosts quickly diminishes. *X. Cheopis* prefers rats over humans, but will use humans in order to survive.

The plague comes in three variant: bubonic, pneumonic, and septicemic.[35] How quickly *Y. pestis* kills and what symptoms manifest depends on how quickly the bacteria enter a person's blood stream. Once *Y. pestis* enters a human's system, it drains through the lymphatic system into the closest lymph node. As the bacteria continues to flood the lymph nodes, it also multiples, doubling every two hours.[36] The time between infection and the appearance of symptoms is two to eight days, depending on the strength of the host's immune system and the bacterial load.[37] The characteristic buboes that give the bubonic plague its name are swollen lymph nodes (occurs two to four days after infection).

The bubonic form is the most common form of the plague. General symptoms are chills, malaise, high fever, headache, muscle cramps, seizures, and buboes. When the bacteria overwhelm its host's lymphatic system, about three days after the buboes appear, it enters the host's bloodstream and the host begins to manifest the symptoms of toxic shock syndrome (leading to the secondary septicemic plague).[38] For those who survive

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[35] There are three biovars of *Y. pestis*: *antiqua* (cause of the First Pandemic), *mediavalia* (cause of the Second Pandemic), and *orientalis* (cause of the Third Pandemic). (Bryne, *The Black Death*, 19). In 1382, papal physician, Raymundus Chalmelli de Vivario, in *Three Books on the Plague*, described different levels of lethality of Plague which parallels the modern differentiation of the bubonic, pneumonic, and septicemic forms of the plague (Ibid., 50).

[36] Bryne, *The Black Death*, 19.

[37] In cases of primary septicemic plague, the time between infection and death can be less than a day.

[38] Irwin W. Sherman, *The Power of Plagues* (Washington, D.C.: ASM Press, 2006), 83.

the bubonic plague, they recover in eight to ten days. The mortality rate for this form of the plague is sixty to eighty percent. Bacteria enter the bloodstream through the lungs and begins to manifest in the pneumatic form of the plague.

The pneumonic plague, as a primary infection, is the only form of the plague that humans transmit, which, when humans are the vector, is through the water droplets in an infected person's breath. After the initial incubation period, a person will develop a bloody cough, a fever, and have difficulty breathing, and will die within a few days. Due to the speed at which the pneumonic plague kills, buboes and other traditional plague features do not have time to develop. A victim's chance of survival is slim, as the pneumonic plague has a ninety-percent mortality rate.

When the bacteria is introduced directly into the bloodstream, a host develops septicemic plague, causing sepsis, destroying the blood's ability to clot, and leading to internal bleeding and organ failure.[39] Symptoms of this form include abdominal pain, bleeding, diarrhea, fever, nausea, and vomiting. Individuals who contract the septicemic variant of the plague, without antibiotics, have no chance of survival. During the Third Pandemic (1855-1959), the average time between the onset of the septicemic plague and death was about fifteen hours.[40] In the end, for all variants, death occurs due to organ failure. Individuals who survive their encounter with the plague are susceptible to other diseases and infections, due to their weakened state, but, with proper medical care, namely antibiotics, full recovery is possible.

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[39] Developing septicemic plague without signs characteristic of the bubonic plague indicates that the host has primary septicemic plague.

[40] Benedictow, 26.

Working on the conjecture that all three variants originate from the same bacillus, and considering the variances in death tolls across Eurasian it is highly probably that multiple strains of *Y. pestis* were present during the Black Death. According to Russian scientists, the strain of *Y. pestis* present in tarabagan, a Mongolian marmot of the Mongolian steppe, as well as other marmots, hosts is the most virulent strain, being extremely lethal and virulent.[41] Of the identified strains, the marmot plague is the only pneumotupic strain, meaning it causes pneumonic infections in infected marmots.[42] This lends credence to the argument the medieval plague originated in the Mongolian Steppe, which has a large marmot population and medieval trade routes crossed this region.

Scholars cannot settle the question of whether the Black Death was the bubonic plague beyond a reasonable doubt, but the work of palemicrobiologists Dr. Didier Raoult, Dr. Michel Drancourt, and their team have provided convincing evidence that *Y. pestis* caused the Black Death. Raoult and Drancourt discovered, "In humans with the plague, death usually occurs during the septicemic phase of the disease and virtually all well-vascularized tissues are contaminated by *Y. pestis*, including the dental pulp."[43] They postulated that dental pulp, by virtue of its vascularization, durability, and sterility, could provide a sample of the bacteria or virus behind the plague. To test their hypothesis, Raoult and Drancourt used teeth from three separate outbreaks in different locations. For the 1347 outbreak, they used teeth from three victims of the plague in Montpellier, France. They also used teeth from two victims of the 1590 outbreak in Lambesc, France,

[41] Kelly, 34.

[42] Ibid.

[43] Drancourt and Raoult, 107.

and three victims of the 1722 Marseilles outbreak. By using a technique called polymerase chain reaction (PCR), they were able to amplify the microbial DNA in order to compare it to modern day microorganisms so as to determine its identity.[44] For their second test, they used twenty-three teeth from graves dating from the Black Death in Montpellier, France. The teeth all tested positive for *Y. pestis*. "Therefore," they write, "[the] results gave certainty that *Y. pestis* was present in the dental pulp of these persons and was the likely cause of death. The fact that two alternative etiologic agents, *R. prowazekii* [typhus] and *B. anthracis* [anthrax] were not detected reinforced this conclusion. This result indicates that the plague had authentically been recognized as a unique morbid entity as early as the Middle Ages, and suggests that medieval descriptions of Black Death can be regarded as true descriptions of plague epidemics."[45]

Medieval Medicine's Interpretation of the Plague

For millennium, along with the idea that miasma is a source of disease, medical practitioners, influenced by the works of Galen, Rhazes, Aristotle, and Hippocrates, believed that health and illness depended on the balancing of a human's four humors: blood, phlegm, black bile, and yellow bile. A person's mood, the environment (heat and moisture), and astrology potentially affected their humoral balance. In order to return a

[44] Ibid., 107-108. Unfortunately, this technique has a high risk of cross-contamination between the samples, bringing into question some of their results. In order to reduce the possibility of contamination they developed a procedure they named "suicide PCR protocol," which allowed them to determine the cause of death.

[45] Didier Raoult, Gérard Aboudharam, Eric Crubézy, Georges Larrouy, Bertrand Ludes, and Michel Drancourt, "Molecular Identification by "Suicide PCR" of *Yesinia pestis* as the Agent of Medieval Black Death," *Proceedings of the National Academy of Sciences of the United States of America* 97, no. 23 (November 7, 2000): 12802.

person to health, a person must restore the balance of his/her humors. If one humor was too weak, its corresponding humor would be too strong, making the humors out of balance and the person ill.[46] Therefore, according to humoral logic, if being too cold caused an affliction, the cure require a treatment to make the person warm.[47]

For medieval medicine, what happens in the sky reflected what happens in a person's body, thus astrology played a very important role in diagnosis a patient's illness. Writing in 1365, John of Burgundy, professor of art and medicine and self-described citizen of Liege, wrote in his tractate, "…the evil influences from on high give rise to corrupt humors or vapours, and these, mingling with the atmosphere, originate epidemics."[48] A person astrological chart also influenced the balance of the four humors. Saturn influenced the black bile humor and was by nature cold and dry. The Moon and Venus ruled the phlegm humor, which was cold and moist. The Sun and Mars ruled the yellow bile humor, whose nature was hot and dry. Jupiter, whose nature is hot and moist, rules the blood humor. Certain combinations of planets led to sickness or health. By knowing a patient's astrological chart, a physician could determine how to treat them by indicating the unbalanced humor.

Medieval doctors studied the ancient texts of Galen and Hippocrates, texts not commonly accessible to the common man. Translating knowledge and experience for the common man, medical tracts, written by doctors and others, contained information about,

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[46] Carole Rawcliffe, *Medicine and Society in Later Medieval England* (Stroud: Alan Sutton Publishing, 1995), 31.

[47] Sarah Frances Vanneste, "The Black Death and the Future of Medicine" (master's thesis, Wayne State University, 2010), 20.

[48] Dorothea Waley Singer, "Some plague tractates (fourteenth and fifteenth centuries)," *Proceedings of the Royal Society of Medicine* 9, Section of the History of Medicine (1916): 163.

and treatment and cures for various illnesses. The widely circulated medical tracts written from 1348-1500 provided various means to explain, prevent and cure the plague, but none proved successful.[49] Some tracts contained instructions on how to make various topical or internal medicines, amulets, and/or treacle, plus which herbal mixes to use in order to purify the air (preventing and clearing miasma).[50] Cures came in the form of bloodletting, emetics, and leeches. Jacme d'Agramont published the earliest known, and surviving, plague tract in April 1348; he wrote it for the common people of city of Lerida in Catalonia, Spain.[51]

In October 1348, forty-nine medical masters gathered to write a plague treatise at the request of King Philip VI of France, titled the *Paris Consilium*.[52] They identified two possible causes of the plague: one earthly and the other celestial. The earthly cause was the poisoned air released by earthquakes and volcanic eruptions, for example the earthquake on 25 January 1348 in the South Alpine region of Friuli in northeastern Italy.[53] Paris doctors considered bad air caused by the triple conjunction, and spread by

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[49] Byrne, *The Black Death*, 33.

[50] A treacle can be loosely defined as a liquid mixture of herbs and other compounds to be taken internally.

[51] Faye Marie Getz, "Black Death and the Silver Lining: Meaning, Continuity, and Revolutionary Change in Histories of Medieval Plague," *Journal of the History of Biology* 24, no. 2 (1991): 272. Other notable tracts are Gentile da Foligno of Perugia, who later died of the plague, and John of Penna in Naple (C.-E. A Winslow and M. L. Duran-Reynals, "Jacme d'Agramont and the First of the Plague Tractates," *Bulletin of the History of Medicine* 22 (1948): 748).

[52] Carl S. Sterner, "A Brief History of Miasmic Theory," 2007, Accessed June 25, 2103 http://www.carlsterner.com/research/2007_a_brief_history_of_miasmic_theory.shtml.

[53] As Italy as a nation-state did not exist during this period, 'Italy' refers to a geographical and cultural region, and contains the majority of the territory that would become the modern Italy (Benedictow, 91).

the south wind, to be the cause of the plague.[54] Under this theory, the noxious vapors carried by the wind could cause a widespread epidemic of disease, thus explaining why the plague spread across Europe.

The heavenly cause was the 20 March 1345 conjunction of Saturn, Jupiter, and Mars in the 40th degree of Aquarius, which occurred after both lunar and solar eclipses.[55] According to Aristotle, a conjunction of Saturn and Jupiter would bring disaster. Albertus Magnus, also called Albert the Great, wrote that a conjunction of Jupiter and Mars brought plague, due to the properties of both planets. Astrology places Jupiter as controlling the blood, or sanguine, humor, which embodies all the other humors and rules the lungs. If the other humors are disrupted, it is not evident until the person becomes ill if the blood humor is in balance. The conjunction of Mars, which is hot and dry and Jupiter, who is wet and moist, leads to putrefaction and excess of energy that causes an imbalance in the other humors, leading to illness and the plague.[56] Many other plague tracts followed the *Paris Consilium* for the next few centuries, all containing potential treatments and explanations for outbreaks but none providing a cure.

Medical knowledge of the time failed to produce any treatment or cure of the plague. This failure, mixed with the recurrences of plague outbreaks, forced doctors to develop new theories, ideas, and treatments, as seen in the widely circulated plague tracts

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[54] Laura A. Smoller, "Earthquakes, Frogs, Snakes, and Storms as Part of a Natural Explanation of Plague," in *Last Things: Death and the Apocalypse in the Middle Ages*, ed. Caroline Walker Bynum and Paul Freedman (Philadelphia: University of Pennsylvania Press, 2000), 90-91. As corrupt air entered a person's body faster than food or water, such vapors could arise from stagnant water, unburied bodies, or the earth after an earthquake.

[55] Barbara W. Tuchman, *A Distant Mirror: The Calamitous 14th Century* (New York: Alfred A. Knopf, 1978), 102-103.

[56] Faye Marie Getz, "Black Death and the Silver Lining: Meaning, Continuity, and Revolutionary Change in Histories of Medieval Plague," *Journal of the History of Biology* 24, no. 2 (1991): 270.

from 1348 to 1500.[57] The idea of infection through direct contagion existed in tracts and chronicles even before Girolamo Fracastoro proposed the concept in 1546 in his work *Contagion, Contagious Diseases and Their Cure*.[58] While contagion theory did not cause dilemmas for Christians, in the Muslim world such theories were heretical. According to the teachings of Islam, God determines whether a person survived an illness, so to suggest God did not cause illness therefore was heretical. During the Black Death, physicians Abu Jafar Ahmed Ibn Khatimah and Lisad-ad Din Ibn al-Khatib, suggested in their writings the idea of contagion.[59] While Ibn Khatimah suggested the idea of contagion, he did not openly support it as Ibn al-Khatib did. Ibn al-Khatib died in 1373 at the hands of a mob after they dragged him from his prison cell.[60] His disregard for Islamic teachings most likely aided in the mob's anger and actions. Yet over the centuries humors and miasmas theories gave way to contagion theories as medical practitioners sought a cure for the plague. The plague, perhaps more so than any other epidemic or endemic disease, played an important role in the development of modern medicine.[61]

Medieval Christians' Interpretation of the Plague

[57] Bryne, *The Black Death*, 33.

[58] R. S. Bray, *Armies of Pestilence: The Impact of Disease on History* (New York: Barnes and Noble Books, 1996), 75.

[59] Kelly, 173.

[60] Ibid.

[61] Bray, 75.

By the fourteenth century, the role and beliefs of the Catholic Church interconnected with social and political structures of the period.[62] The centralized nature of the Church which required certain standardizations, such as language, changed the western world by providing a framework of governance and uniting people in different lands and cultures with a common religion. Due to the integration of Church beliefs into medieval society, in order to understand the mindset/mentalities of medieval man one must first explore the beliefs and ideas of the Church during the period.[63] For Christians, in a world turned upside down, the Bible provided an interpretative model through which to understanding the events and find comfort. According to the Bible, pestilence resulted from God's wrath for people's sin.[64] Just as cleansing the air of miasma adverted illness, so would repentance bring protection.

For the next 300 years the Black Death, people continued to see the plague as an act of God, provoked by sin or toleration of sin and ungodly groups, such as the Jew, foreigners, and prostitutes.[65] The toleration of godlessness and the ungodly explained for some the widespread nature of the plague and did not simply visit specific groups or a specific type of sinners.[66] God's punishment was not for individual sin but the collective sins of His people and only by repentance could people advert the plague. People reacted

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[62] Paul Binski, *Medieval Death: Ritual and Representation* (Ithaca: Cornell University Press, 1996), 10.

[63] Tuchman, 32.

[64] William Naphy and Andrew Spicer, *Plague: Black Death and Pestilence in Europe* (Gloucestershire: Tempus, 2004), 13.

[65] Ibid., 117. Historian Barbara Tuchman lists the sins on "the conscious" of fourteenth century men as "…greed, sin of avarice, followed by usury, worldiness, adultery, blasphemy, falsehood, luxury, irreligion" (Tuchman, 104).

[66] Stephen Porter, *The Great Plague* (Gloucestershire: Sutton Publishing, 1999), 7.

in both guilt and fear. Some zealously purged sin from their lives, encouraging others to do the same; others sought scapegoats. Jews, more so than other groups, fell victim to Christian fear; resulting in ethnic cleansing and Jewish migration to Poland.

The 14th Century, a Century of Disaster

The Black Death came upon people and societies in a fragile balance with the environment. With the land exhausted and economies stagnant, very little could go wrong without the entire system collapsing.[67] In the fourteenth century, a lot went wrong.

An unstable climate and cooling temperatures led to many of the fourteenth century's disasters. Beginning as early as 750 C.E. and lasting until the end of the thirteenth century, global temperatures grew warmer and the weather stable – a period called the Medieval Optimum. During this period, harvests in Europe became more consistent and plentiful. The plenty of the Optimum led to a population boom across Europe, at least doubling its population.[68] Then, in the mid-thirteenth century, the Little Ice Age began, lasting until the mid-nineteenth century.[69] While the cause of the Little Ice Age is debatable, its impact on the Earth is quite evident and stands in stark opposition to the Medieval Optimum. For example, historian John Kelly used tree ring

[67] Kelly, 57.

[68] Ibid., 44-58.

[69] Note: the dates for both the Medieval Optimum and the Little Ice Age are debatable.

data in studying the early fourteenth century and concluded it was one of the most severe periods of environmental stress in the last two thousand years.[70]

With the start of the Little Ice Age, and its cooling temperatures, the weather grew unstable and crop yield dropped.[71] Dependent on cereal crops at this time, which are highly sensitive to weather conditions, years of heavy rains and dark skies led to famines. Thirty years prior to the Great Mortality, as contemporaries called the Black Death, the Great Famine (1315-1322) wrought its destruction across Europe. Beginning in 1315, torrential rains and overcast skies produced poor harvests and soaring food prices, which lasted until 1322 for most of Europe.[72] The true death toll of the Great Famine, like the Black Death, cannot be calculated and varied greatly across Europe and England, but it is somewhere between ten to twenty-five percent.[73] Children born during the Great Famine reached maturity by the Black Death.

In a 1997 article, nutritionist Dr. Sophie E. Moore made a connection between fetal malnutrition and defective immune systems.[74] Maternal malnutrition during pregnancy led to children with defective immune systems. In the long term, fetal and childhood malnutrition leaves a person's immune system underdevelopment, placing

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[70] Ibid., 14 and S. Wells Williams, *The Middle Kingdom: A Survey of the Geography, Government, Literature, Social Life, Arts, and History of the Chinese Empire and its Inhabitants*, rev. ed., vol. II (New York: Charles Scribner's Sons, 1901), 17.

[71] The demands of the population boom during the Medieval Optimum caused low quality lands to be put into production and fertile land to be overused, leading to soil exhaustion in the thirteenth and fourteenth centuries, which dropped the crop yield.

[72] Williams, 19.

[73] Kelly, 62, Williams,119-124, and John Aberth, *The Black Death, 1348-1350: The Great Mortality of 1348-1350: a Brief History with Documents* (Boston: Bedford/St. Martin's, 2005), 17.

[74] Kelly, 62.

them at greater risk of infection and disease for the rest of their life.[75] Those born or were young children during the years of the Great Famine became adults during the Black Death.[76] High mortality rates amongst this group reflected their compromised immune systems, especially for the poor. While not the only factor involved in killing off youths and adults during the Black Death, the connection between famine, disease, and poor immune systems aides in explaining both who died and why so many people died.

Along with adversely stressing human populations, the environmental upheaval also placed stress on animal populations. In a rodent population, stress could trigger an epizootic outbreak of bubonic plague, which could easily transfer to human populations as infected rodents leave more remote areas for human settlements for food and shelter. Combined with travel routes through infected regions, these conditions primed Eurasian for a pandemic.[77]

In this ill-equipped and ripe for disaster Europe, floods, famines, pestilence, and rumors of war abounded; disaster seemed to be lurking around every corner. Malnutrition and exhaustion weakened the medieval population as wars recruited men away to battle – men who, along with their companies, carried back their plunder to their homelands.[78] Filth, famine, and overcrowding led to epidemic diseases, added to a long list of endemic diseases. Along with social, climatic, and ecological instabilities, the

[75] Williams, 116-117.

[76] Ibid., 186.

[77] The Black Death was not a simple Malthusian check.

[78] Philip Ziegler, *The Black Death* (New York: John Day Company, 1969), 35.

medieval man knew disaster was close and readily accepted it, as an act of God, when it did occur. Indeed, in the fourteenth century, the apocalypse of Revelation seemed close at hand.

Plague's Importation into Europe

As plague-carrying rodent populations live in isolation from humans, an event occurred in the fourteenth century that sparked an epizootic outbreak of the plague and initiated rodent migration. During the 1310s, Europe experienced harsh environmental conditions, and during the early 1330s, China had its turn. During this period, reports of environmental disasters in China reached the Mediterranean world. China, and surrounding regions, underwent cycles of torrential rain and droughts; swarms of locusts blotted out the sun; earthquakes caused the earth to give way and swallowed part of the village of Kingsai and the mountain Tsincheau, and the mountains of Ki-ming-chan gave way and created a lake "one hundred leagues long"; and a volcano erupted in Indonesia.[79] In 1331, Chinese records tell of the appearance of a mysterious illness. A year later the Chronicles of the Great Mongol Khanate of Mongolia and Northern China record the death of the Khan Jijaghatu-Temur and his sons from a mysterious illness.[80] The environmental disruptions, caused by geologic activity and the Little Ice Age, caused the migration of plague-infected rodents. The trading routes that intersected the rodents' territory and migration route became plague-infected due to stowaways (both rodents and fleas who took advantage of grain and other food products). Had environmental factors

[79] Kelly, 4.

[80] Ibid., 6.

not disrupted plague-carrying animals' habitats, forcing them to relocate, it is possible the Second Pandemic would have started later.

According to tradition, Genoese sailors imported the plague into Europe after escaping the Mongol's siege of Caffa. A plague outbreak amongst the Mongol coincided with the siege and the army's infection spread to the residences of Caffa.[81] While it is clear that Genoese sailors introduced the plague to Constantinople and Italy, the account of the first recorded act of biological warfare, where Jani Beg, khan of the Golden Horde, catapulted plague-infected bodies over the wall into Caffa, may not be completely credible. Questions of credibility arise as Gabriele de'Mussis, an Italian notary and the originator of the account of the siege of Caffa, was not an eyewitness to the event, though he may had had a credible eyewitness as a source.[82] Yet armies often catapulted bodies over city walls during an extended siege, so this account is not without precedent. While the bodies of plague victims potentially spread the disease to the Genoese of Caffa, it is also highly probably that rats spread from the Mongol camp into the city, or perhaps the outbreak of plague coincided with the arrival of the Mongols and their siege. However it infected them, the Caffa refugees, along with other groups traveling from Asia into Europe, spread the bubonic plague into Europe.[83]

[81] Caffa, now Feodosiya, is located on the northeastern coast of the Black Sea, or the southern coast of the Crimean Peninsula in the Ukraine.

[82] Bryne, *The Black Death*, 7 and Mark Wheelis, "Biological warfare at the 1346 siege of Caffa," *Emerging Infectious Diseases* 8, no. 9 (2002): 973.

[83] Wheelis conjectures that the refugees of the siege of Caffa may have not been the only infected parties to introduce the plague into Europe, but, instead, this account is the most dramatic and thus most popular version of events (Wheelis, 974).

Chroniclers in Sicily and Messina were the first to record the entrance of the plague into Europe, though it most likely first struck in other port cities along Europe's Mediterranean coast. Franciscan Michele de Piazza recorded "In October 1347, at about the beginning of the month, twelve Genoese galleys, fleeing from the divine vengeance which Our Lord had sent upon them for their sins, put into the port of Messina. The Genoese carried such a disease in their bodies that if anyone so much as spoke with one of them he was infected with the deadly illness and could not avoid death."[84] In another translation, the Genoese sailors are described as carrying the disease in their bones.[85] Gabriele de' Mussis chronicled, "As it happened, among those who escaped from Caffa by boat were a few sailors who had been infected with the poisonous disease. Some boats were bound for Genoa, others went to Venice and to other Christian areas. When the sailors reached these places and mixed with people there, it was as if they had brought evil spirits with them: every city, every settlement, every place was poisoned by the contagious pestilence, and their inhabitants, both men and women, died suddenly."[86] The events de' Mussis observed, with varying levels of panic and fear, repeated throughout Mediterranean and European port cities as the plague spread across the region.

The Plague's Deadly Journey Across Europe

Carried by fleas, rats, and humans, only the speed of travel limited the rate at which the plague moved. Once abroad ships, the plague spread rapidly across Europe

[84] Rosemary Horrox, ed., *The Black Death*, Manchester Medieval Sources Series (Manchester: Manchester University Press, 1994), 36.

[85] Michele da Piazza, *Cronaca*, ed. Antonino Giuffrida (Palermo: ILA Palma, 1980), 82.

[86] Horrox, 18.

through in-land trading routes and seaports. The more trade routes that crossed a region the increased likelihood of traders and travelers introducing multiple strains of the plague into a region, leading to higher mortality rates these areas than more remote locations.[87] Regional weather also influenced the timing of the plague and the prevalence of pneumonic plague, such as in areas with a cold or damp climate. For example, during an outbreak of the plague, pneumonic plague predominated from January to March, with fewer outbreak occurring in the Spring.[88] In the warmer weather of late spring and summer, bubonic plague dominated.[89] During the Black Death, the plagued lingered in larger cities due to larger and denser populations as compared to smaller communities and while the deadliest period of the plague lasted only a few months, the last reported casualties occurred nearly two years after the plague's arrival.[90]

While the immediate impact of the Black Death varied across the continent, some areas experiencing more death, deadly hunts for scapegoats, and/or hyper-religious activities than others, almost all communities came to a halt for a few months at the height of the epidemic in their community. In the long-term, some communities found it easier to resume political and legal functioning than others; while others experienced social and economic upheavals.[91] Major urban centers, such as London, recovered faster than rural areas due to an influx of population from the countryside. The return of

[87] Robert S. Gottfried, *The Black Death: Natural and Human Disaster in Medieval Europe* (New York: The Free Press, 1983), 66.

[88] Ziegler, 157.

[89] Ibid.

[90] Ibid.

[91] J. N. Hays, *The Burden of Disease: Epidemics and Human Response in Western History* (New Brunswick: Rutgers University Press, 1998), 44.

London's political and community leaders from their countryside estates, having left London to avoid the plague, also aided in its quick recovery.

Not finding relief from the Church, a movement arose that temporarily captured the imagination of those in its path before dissolving due to the corruption of its purpose and actions. The flagellant movement of the Black Death primarily occurred in northern and central Europe, excluding England. This movement, born from intensified religiosity and disappointment in the Church's inability to end the plague, also challenged the authority of the Church. Beginning as a movement to repent and remove God's punishment, the movement slowly garnered a bad reputation that led to its dissolution.

During the height of the Black Death, as death and fear saw the temporary collapse of morality and society, the extremes of human nature were set free. In the search for scapegoats, Jewish communities were blamed for bring the plague into a community through the poisoning of wells, even though Jewish communities also suffered greatly from the plague. Not until World War II would a genocide, on the same geographical scale, occur. Europe's Jewish population shifted eastward to the Polish-Lithuanian Commonwealth due to Poland's King Casimir the Great's promise of sanctuary and protection. Casimir's actions stemmed more from the economic benefit Jewish communities offered, mostly from moneylending and brokering, something forbidden to Christians, than out of concern for Jewish people's survival. In 1290, through the Edict of Expulsion, King Edward I exiled all Jews from England, preventing the spread of violence into England.[92]

[92] George Hare Leonard, "The Expulsion of the Jews by Edward I.: an Essay in Explanation of the Exodus, AD 1290," *Transactions of the Royal Historical Society* (New Series) 5 (1891): 103-146.

The Plague's Importation into England

The Black Death arrived in England during the summer of 1348, most likely in July or August. Melcombe Regis, the modern Weymouth, was the likely entry point because of its role in Edward III's besieging of Calais, a French town on the north coast of France that belonged to England at that time.[93] If the plague did not arrive via Calais into Melcombe Regis, than the Channel Islands was the next most likely candidate.[94] The spoils of war brought home by campaign communities, composed of men, and men and women who supported them, included items such as furs, pillows, linens, clothes, and sheets – all potential homes for plague-infected fleas and materials.[95] Similar to the trading routes from China, it was highly probable that infected rats also stowed away aboard ships bound to Melcombe Regis and other English ports.

The delay in the plague's importation into England gave its people time to prepare, even if they thought themselves untouchable, for the coming apocalypse.[96] While none could truly prepare for the scope and mortality of the pestilence, for over a year the English had heard stories of the plague, therefore, unlike most of Europe, the plague did not catch the English unaware. The chroniclers, unlike those in Europe, did not record the same level of panic and desertion.[97] Similar to Italy, with its number of

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[93] Kelly, 189.

[94] John Findlay Drew Shrewsbury, *A History of Bubonic Plague in the British Isles* (London: Cambridge University Press, 1970), 37-38.

[95] John A. Lynn, *Women, Armies, and Warfare in Early Modern Europe* (Cambridge: Cambridge University Press, 2008), 188-189.

[96] Kelly, 86.

[97] Ziegler, 133.

port cities, England provided the plague many ports of entry, causing travelers to introduce new strains, which resulted in a greater mortality.[98]

From Melcombe Regis the plague spread along the western and eastern coasts, both due to the trade routes out of Melcombe Regis and due to the other ports, suggesting the plague arrived from not only French sources but Italian as well.[99] "Then the dreadful pestilence," wrote Henry Knighton, a canon of St. Mary-of-the-Meadow Abbey of Leicester, "made its way along the coast by Southampton and reached Bristol, where almost the whole strength of the town perished, as it was surprised by sudden death; for few kept their beds more than two or three days, or even half a day. Then this cruel death spread on all sides, following the course of the sun."[100] From Bristol and Gloucester, the plague moved north and northwest, heading towards Wales and along the main road to London.[101] Being a major trading center and port made London susceptible not only by land but also from sea. As described by historian, and historical demographer, Ole Benedictow, the plague advanced towards London in a three-pronged approach – the road from Gloucester (southeast), the road from Melcombe Regis (northeast), and by ship.[102] The Black Death reached London in autumn of 1348. By the summer of 1349, in roughly 500 days, the plague had reached most of England.[103]

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[98] Gottfried, 58.

[99] Ibid., and Benedictow, 130.

[100] Gottfried, 58-59.

[101] Benedictow, 132.

[102] Ibid., 134.

[103] Ibid., 142 and Jim Bolton, "'The World Upside Down' Plague as an Agent of Economic and Social Change," in *The Black Death in England, 1348-1500*, ed. Mark Ormrod and P. G. Lindley (Stamford: Watkins, 1996), 22.

The English Response and Experience

At the height of the plague, society ceased to exist for a time as people died, fled to perceived safety of other locations, or avoided human contact outside their homes.[104] In some locations, decimated by the plague, entire villages disappeared. During the Black Death, as the Court Rolls can attest to, though far from normal communal life survived as people attempted to continue life as usual.[105] In 1350, at the Farnham, an estate of Bishop Edendon's diocese, John Ronewyk, the reeve or manager of the estate, was able to maintain order, even in the face of heavy losses to the plague, and bishop's manor received more than it usual annual refurbishments.[106] This was a testament of Ronewky's leadership and ingenuity in the face of tragedy and social upheaval.[107] Despite the losses and social disruption and breakdown, the English people and their culture survived, though transformed by their first experience with the bubonic plague.

In times of tragedy, the strength and actions of those in leadership keeps people from panicking.[108] Citing the Broken Window theory of human behavior, Kelly writes, "when authority and leadership break down, people become more prone to lawlessness,

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[104] Ziegler, 134.

[105] Ibid.

[106] Kelly, 202 and 206. The hundred comprised of twelve villages – Farnham, Waverley, Runwick, Tilford, Elstead, Runfold, Badshot, Wrecclesham, Compton, Churt, Frensham, and Tongham, plus a few tenements in Cobbegate and Snayleslynch, and had a population of 3,000 to 4,000 (Etienne Robo, "The Black Death in the Hundred of Farnham," *English Historical Review* (1929): 560). In the end, the death count was upwards of 1,370 death, possibly more.

[107] The cumulative effect of the plague did start to show after about two years on the amount the manor was able to pay in taxes, a result of the number dead, tenets who left for work in cities, and general disorganization (Robo, 566).

[108] Kelly, 207.

violence, and despair, in the same way that a defeated army becomes more prone to panic if the officers fail to provide resolute leadership."[109] If a leader is proven weak, chaos and panic can result. Edward III, king of England during the Black Death, proved to be a strong leader, continuing to govern throughout the epidemic. During this period, for example, he froze wages (in 1349 and 1351) as laborers were able to demand more and he kept abreast of his war with France.[110] His actions demonstrated to his subjects that he was still in authority and the country would continue despite their uncertain future. During this period, the Exchequer (or Treasury) continued to function, they collected taxes, and the courts remained open.[111] While the feudal manorial system came to its end after the Black Death, this system, in the short term, provided another layer of stability and security that sustained order, self-discipline and lawfulness.[112]

The plague took a large toll on the clergy, with a mortality rate about forty-five percent across England, along with clergy deserting or being forced to relocate, caused many areas to be without a priest to give them their last sacrament. Bishop Ralph of Shrewsbury gave laymen and women the authority to hear last confessions of the dying, an indication that in this state of emergency, the Church was unable to cope and meet the needs of its flock.[113] In his January 10, 1349, the Bishop announced:

> The contagious pestilence, which is now spreading everywhere, has left many parish churches and other benefices in our diocese without an incumbent, so that their inhabitants are bereft of a priest…we understand that many people are dying

[109] Ibid.

[110] Ibid., 212.

[111] Ibid.

[112] Ziegler, 134 and Kelly, 207.

[113] Ziegler, 125.

> without the sacrament of penance, because they do not know what they ought to do in such an emergency and believe that even in an emergency confession of their sins is of no use or worth unless made to a priest having the power of the keys …if on the point of death they cannot secure the services of a properly ordained priest, they should make confession of their sins, according to the teaching of the apostle, to any lay person, even to a woman if a man is not available.[114]

Studies of pre-Reformation religion demonstrate, as explained by historian Christopher Harper-Bill, "that late medieval Catholicism was a vibrant faith which satisfied all levels of society. This was essentially a 'broad church,' catering admirably for all but the tiny minority who rejected its basic tenets…it may be that the impact of the plague accentuated the anxiety of literate elements of the laity to participate in the widening of personal religious experience and to embrace a view of Christian conduct first propounded in the lecture halls of Paris and in the Cistercian cloisters of the Twelfth century."[115] Essentially, while the Church's failures, which receive more focus than their success, injured its reputation, they did not undermine its power and authority in the eyes of the general populace. Therefore the plague indirectly influenced the Reformation, instead of causing it.

While England had mass graves similar to those described by Giovanni Boccaccio and Francesco Petrarch in Italy, archeological evidence suggests the English made efforts to maintain burial rites and proper burial practices. "If," Kelly writes, "a measure of a civilized society is the ability to bury its dead with dignity, then evidence from the plague

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[114] Horrox, 271-272.

[115] Christopher Harper-Bill, "The English Church and English Religion after the Black Death," in *The Black Death in England, 1348-1500*, ed. Mark Ormrod and P. G. Lindley (Stamford: Watkins, 1996), 122-123.

pit suggests that civilization held in London."[116] From archeological excavation found charcoal and ash in coffins and shrouds, both of which help to slow the decay/putrefaction process, suggesting some type of methodical or hierarchical system of burial.[117] Slowing the decay process provided more time for proper burials. This systematic burial of the dead occurred during the Black Death and the Great Plague of 1665.[118]

The death toll of the Black Death is unknown and differed across Europe and even within the same country. The estimate for England's death toll is somewhere between five percent (as determined by bacteriologist J. F. D. Shrewsbury) to ninety percent (as some contemporary chroniclers estimated).[119] Scholars have concluded that Shrewsbury estimate is too low and ninety percent is much too high. Allowing for regional differences, some areas sustaining heavier losses, Europe lost between thirty and sixty percent of its population to the Black Death.

Cycles of Plague

While the Black Death resulted in deep psychological scarring for the people of England and Europe, it was the cycling of the plague that kept the fear of the disease alive and prevented Europe's population from rebounding, etching the Great Mortality in the memories and cultures of Europe. The frequency of epidemics, an important feature

[116] Ibid.

[117] Ibid.

[118] Ibid.

[119] Bray, 60.

of the Second Pandemic, meant at least one outbreak occurred per generation. Though the death rates of later epidemics was ten to fifteen percent, sometimes as low as five percent, the plague outbreaks maintained similar levels of fear as it did during the Black Death.[120] Due to the first few epidemics of the Second Pandemic, as seen in the first poll tax in 1371, a population loss of eighty percent occurred.[121] While it is impossible to know the exact loss, especially as the death rates of the outbreaks after the Black Death are not well documented or are lost as a result of administrative upheavals and changes in migration patterns, it is clear that there was a substantial loss.[122] Because of the rural to urban migration, and the larger percentage of death, due to cities being prime candidates for endemic and epidemic diseases, occurring in urban centers, rural areas suffered the bulk of this depopulation.

The *pestis secunda*, the second epidemic of the plague, broke out across Europe in the spring of 1361 and lasted into the spring of 1362.[123] While the mortality of the second epidemic of plague was not as severe as the Black Death, it still took a toll on Europe. In England, the *pestis secunda* killed about twenty percent of its general population and twenty-five percent of its landed gentry.[124] In Europe this visitation of the plague killed between ten and twenty percent of its population.[125] The Black Death

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[120] Gottfried, 131.

[121] Colin Platt, *King Death: The Black Death and Its Aftermath in Late-Medieval England* (London: University College London Press, 1996), 11. This lose is not simply due to the plague but birth rates and diseases. Local population losses also included outward migrations.

[122] Bolton, 27.

[123] Gottfried, 130-131.

[124] Ibid.

[125] Ibid.

overshadows the lethality of the pestis secunda, but this outbreak, followed by others, continued to keep Europe's population low.

The mortality of the third epidemic, *pestis tertia*, of the plague in 1369 was about thirteen percent among the clergy and gentry; killing ten to fifteen percent of Europe's population.[126] Understanding the plague as a part of their new reality or simply dejectedly acceptance the inevitability of the continued presence of the plague, chroniclers began noting the presence of plague, if they did at all, in matter-of-fact terms.[127]

The reoccurrences of the plague occurred in intervals of two to twenty years.[128] Between 1353 and 1550, eighteen major epidemics were recorded across Europe, but none on the same scale as the Black Death.[129] From 1347 until 1670, the plague was continually present somewhere in Europe.[130] While in the early years of the Second Pandemic the plague would strike every two, five, six, or twelve years, by the fifteenth and sixteenth centuries the intervals between epidemics increased to every twenty years, which continued in keeping Europe's population growth in check.[131]

The plague outbreaks of the Second Pandemic post-Black Death differed from the first wave of outbreaks in several ways. While the later outbreaks were still highly deadly, such as in London in 1665 and Marseilles in 1720, mortality rates at about ten to

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[126] Ibid.

[127] Ibid.

[128] Ibid, 9.

[129] Bryne, *The Black Death*, 9.

[130] Hays, 46-47.

[131] Ibid.

fifteen percent.[132] Doctors no longer reported symptoms, like spitting blood, and the epidemics seemed largely bubonic with fewer incidences of the pneumonic form.[133] Outbreaks became local and not geographically widespread and occurred mostly in summer instead of year round.[134] Instead of the rapid spread of the early plague outbreaks, later outbreaks moved at a slower pace and tended to cluster within a city or neighbor, not spreading from city to city.[135] Doctors did not observe these characteristic in the outbreaks of the Third Pandemic.

Similar to the plague spreading along trade routes, news of an outbreak traveled along these routes, providing communities time to enact preventative measures, such as quarantines and restricting travel and exchange of material goods. Government found knowledge of outbreaks useful as it held the potential to influence diplomacy, war, trade, and the economy.[136] Merchants and travelers also found this information was useful as it allowed them to take detours and avoid quarantines. These measures meant with some success and laid the foundation for future boards of health.

The plague's continued presence required a state of vigilance in order to prevent further outbreaks. In 1663-1664, The Netherlands experienced a plague outbreak. England's Privy Council responded by placing quarantines on any ships coming from the Netherlands or any infected port city. Towards the end of 1664, the *Bills of* Mortality began to report deaths due to plague St. Giles-in-the-Field, located in London's West

[132] Kelly, 278-279.

[133] Ibid.

[134] Ibid.

[135] Ibid.

[136] Stephen Porter, *The Great Plague* (Gloucestershire: Sutton Publishing, 1999), 27.

End, but it appeared to be a localized outbreak, thus not raising much concern.[137] Begun in 1592 after a plague epidemic and so to provide a means of warning of an escalating plague outbreak, the *Bill of Mortality* was a weekly count of the number dead – after 1629, it also differentiated the cause of death. As the plague spread to other parts of London, the *Bills* underreported the number of plague victims, a result of families and parish clerks not always reporting outbreak related deaths. Furthermore, the government also played a role in misrepresenting the scale of the outbreak, for military (England was at war with the Dutch), economical (so to maintain trade relations with other countries), and social (to curb fear) reasons.[138]

The outbreak grew steadily worse as 1665 progressed, reaching a full-blown epidemic throughout London by June. As historian Stephen Porter describes, "In the 130 parishes recorded in the *Bills*, the weekly number of deaths from the disease rose from 470 to 2,010 during the month [of July], and total deaths from 1,006 to 3,014," morality rates for July being four to ten times higher than the previous decade.[139] London's previous outbreak in 1603 was over by August, but the 1665 outbreak showed no signs of slowly as August came to a close.[140] The outbreak finally burned itself out by January of 1666. Similar to London's experience during the Black Death, the plague proved to be virulent and deadly, a fitting reminder of its power as it disappeared from England thereafter.

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[137] Ibid., 37.

[138] Ibid., 35 and 36.

[139] Ibid., 41.

[140] Ibid., 51.

The bacterium, *Yersinia pestis*, meets the basic fundamental definition of life. Yet, its history and purpose are not as easily understood or accessible as humans. Traditionally, the human story of the Second Pandemic, beginning with the Black Death, is told on human terms of lives lost and social aftermath. The period from 1348 to 1352 reflects the years of the Black Death in Europe and to limit an analysis of the experience to these four years denies the greater complexity of the pandemic as well as the larger human experience for the Black Death began in China in the 1330s. Limiting the Black Death to a four-year period also perpetuates a Eurocentric historical narrative. The environmental factors are important to understanding the timing and spread of the outbreak. The politics and beliefs of the period adds another layer to understanding the Black Death as not simply an isolated historical event but a shared experience interpreted differently through cultural and social lenses. Alongside expanding the traditional narrative of the plague is the story of the human interaction with *Y. pestis*.

For *Y. pestis*, its story of migration from the Mongolian Steppe to the shores of England is a story of survival. Humans are not *Y. pestis*'s preferred hosts, thus the transmission of the bacteria to humans from a rodent vector population is a historical accident, caused by necessity and mechanisms of nature to reproduce and survive. Though *Y. pestis* meets the basic definition of life, if it possesses some level of consciousness or will is questionable. From modern science's understanding of bacteria, *Y. pestis* did not intentional seek to depopulate the human population of Eurasia, or that of potential hosts. By understanding *Y. pestis'* transmission to and presentation in human hosts provides intriguing insight into the behavior and reactions of humans during plague

outbreaks. Including the history of disease and epidemiology into the history of the Black Death further illuminates the interaction of humans and disease.

Tracing *Y. pestis*' geographical, temporal, and evolutionary journey reveals a larger story of interaction and change that stretches further back into time than the fourteenth century – the bacterium's complicated nature suggesting an ancient origin. The interaction between the bacterium, vectors, environment, and humans weaves a story of influence and interconnectedness. Following the migration of the bubonic plague sets up the next part of the story, the human story of response and survival. In this case, how did English society survive when others around them collapsed? How did the English respond to the devastation the plague left in its wake? Finally, how did this reaction change England?

CHAPTER 3

THE ENGLISH RESPONSE TO THE BLACK DEATH

The Black Death marked a critical turning point in England's history. The depopulation that resulted from losing upwards of fifty percent of its population required the English economy to begin transitioning from being labor intensive to land intensive. This transition, like many others, occurred gradually overtime. Historians Ole Benedictow and Robert Gottfried, in their analyses of the long-term changes in England and Europe, included economic changes at the top of their lists. They also included depopulation of rural areas, nature reclaiming land, changes in land tenure, technological changes, taxes and taxation systems, secular education, the rise of vernacular language, changes in demand and consumption, and laying the groundwork for the future World Health Organization. The Black Death acted as a catalyst of change, providing an opportunity for the redefining of English society.

What is fourteenth-century English culture? After centuries of repeated conquests and invasions, by 1500 the English were a mixture Celts, Romans, Germanic Angles and Saxons, Nordic Jutes, Vikings, and Norman French, resulting in a culturally fractured England.[141] The Norman Conquest of 1066 marked a turning point in English history, a transition from an Anglo-Saxon England to a Norman England. Instead of being responsible for the unification of England, William the Conqueror built upon the preexisting political and social structure, replacing English landowners, officials (church

[141] Anthony Easthorpe, *Englishness and National Culture* (London: Routledge, 1999), 48.

and court) and language with Norman counterparts.[142] The new social elites shared a common culture and distanced themselves from those beneath them.[143] Politically, in his victory, William 'inherited' from the Anglo-Saxon king, Edward the Confessor, whose death sparked William's invasion to lay claim to the Anglo-Saxon throne, "a well-ordered state with a uniform system of administration, a highly developed structure of royal law, a centralized coinage and an effective system of taxation."[144] Even with "a well-ordered state," the king's power rested on his ability to command the loyalties of the nobility and gentry, in order to raise money through taxation and for his decrees to be enacted, resulting in a tenuously unified governing system. The turmoil of the fourteenth century, through famine, disease, and war, saw the beginning of political unification for England and the slow formation of a national identity.

Though percentages give an idea of the number dead, numbers conceals the individual stories left unrecorded. As historian Colin Platt writes, "In agricultural communities dependent on young labour force, *who* died might be as important as *how many.*"[145] With the decrease in population, thus further workers, England transitioned from a labor intensive to land intensive system.[146] The reduction of workers also, temporarily, raised wages allowing for a redistribution of wealth and giving workers

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[142] Krishan Kumar, *The Making of English National Identity* (Cambridge: Cambridge University Press, 2003), 49-50.

[143] Thorlac Turville-Petre, *England the Nation: Language, Literature, and National Identity, 1290-1340* (Oxford: Clarendon Press, 1996), 10.

[144] Kumar, 42-43.

[145] Colin Platt, *King Death: The Black Death and Its Aftermath in Late-Medieval England* (London: University College London Press, 1996), 9.

[146] R. S. Bray, *Armies of Pestilence: The Impact of Disease on History* (New York: Barnes and Noble Books, 1996), 68.

increased buying power to purchase land, houses, tools, and other material goods, as well, in some cases, allowing people to marry up.[147]

While medieval English society was not bleak and hopeless, people were generally more optimistic than pessimistic. The population pressures and limited economic opportunities limited social mobility and made life difficult for the common peasant.[148] Informal social controls and enforcement of social hierarchies placed limits on social mobility. After the Black Death, the pressures holding existing social structures decreased dramatically; especially with subsequent outbreaks further reducing population size, requiring new means and methods of social control.

In the wake of the plague, all levels of English society underwent change. Amongst the gentry, property qualification increased for holding political office. Tensions between county and parish gentry resulted in greater efforts to distinguish between types of gentry, based on location and landholdings, resulting from changes in land distribution, due to death and inheritance laws, and in income generated from tenants and other sources.[149] A similar stratification occurred among peasants, merchants, and others, as increased income allowed people access to food and material goods previously out of reach, resulting in efforts to limit what people could wear or eat based on an individual's income level. The collapse of certain social structures that

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[147] Joseph Byrne, *The Black Death* (Westport: Greenwood Press, 2004), 64.

[148] For further reading on daily life in the middle ages, I suggest Robert Fossier, *The Axe and the Oath: Ordinary Life in the Middle Ages* (Princeton: Princeton University Press, 2012) and Christopher Dyer, *Everyday life in Medieval England* (London: Bloomsbury Publishing, 2000).

[149] Jim Bolton, "'The World Upside Down' Plague as an Agent of Economic and Social Change," in *The Black Death in England, 1348-1500,* ed. Mark Ormrod and P. G. Lindley (Stamford: Watkins, 1996), 48.

helped society survive in the Black Death increased social anxieties, namely the changes occurring in villages due to the depopulation caused by disease and migration. The movement of people, not simply in rural areas but rural to urban, disrupted the social balances of villages.

English Politics

The English monarchy's wish to rule France, which culminated in the Hundred Years War, was a legacy of the Norman Conquest of 1066. The justification for English conquest derived from the lineage of kings, desire to preserve the Anglo-Norman state, and to preserve Plantagenet lands on the continent.[150] By 1200 the preservation of the Norman-Anglo state was no longer a concern and instead England's leaders placed a greater emphasis on maintaining power over the extremities of the Plantagenet territory and the people there within. The romanticization of the past and the emerging ideal of the Anglo-Saxon state now influenced the justification for war. From the twelfth to the fifteenth century, war was a significant agent of social change and, as such, played a role in how England changed during the fourteenth century.[151]

In government, the financial cost of waging war developed a system of taxation that required community consent and cooperation, which gave community representatives and leaders political power, either supporting the king and carrying out his decrees or undermining his power and authority. While authority and ultimate responsibility for maintaining his kingdom rested in the king, the power to rule and carry out decrees rested

[150] Edmund King, *England 1175-1425* (New York: Charles Scribner's Sons, 1979), 1-3.

[151] Ibid., 1-2.

in the social, economic, and intellectual elites, for example, the nobility, landed elites, and the church.[152] A king's ability to elicit and maintain the cooperation of barons, lords, and other nobles directly determined the effectiveness and success of his reign. A weak king would be ineffective because he would lose control of the nobles and a heavy-handed king would lose support. Fortunately, for fourteenth-century England, Edward III proved to be an effective leader for most of his reign.

Edward III's father, Edward II of the House of Plantagenet, failed as a king – he did not possess the necessary skills required to unify and effectively rule his kingdom. In a series of events, with all the drama of a medieval tale, in September 1326, Isabella, Edward II's wife, and Roger Mortimer, her love, overthrew Edward II.[153] The charges listed against him in the deposition articles included incompetence and an unwillingness to listen or learn from wise counsel.[154] Moreover he supposedly destroying the church and nobles of his realm, lost Scotland, Ireland, and Gascony due to his inadequacies as a military leader, and broken his coronation oath.[155] While the list included exaggerations, his incompetency, as a rule, was not.

On February 1, 1327, at the age of fourteen, Edward III became the King of England. Though king, Isabella and Mortimer usurped Edward's power. Though promising to end the corruption of Edward II's reign, Isabella and Mortimer abused their

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[152] Scott L. Waugh, *England in the Reign of Edward III* (New York: Cambridge University Press, 1991), 5.

[153] Ibid. Scholars debate whether Edward II survived 1327. For an in depth analysis of Edward II's death, see Ian Mortimer, "The Death of Edward II in Berkeley Castle," *The English Historical Review* 120, no. 489 (Dec. 2005): 1175-1214.

[154] England did not have precedence in deposing a king at this time.

[155] King, 153.

position and power and quickly became unpopular. Intrigue, debt, heavy taxation, and military losses marked their short time in power.[156] On the night of October 19, 1330, Edward and sixteen of his supporters arrested Mortimer, later putting him on trial and executing him at Tyburn for crimes that included the murder of Edward II, falsely claiming royal power, and other misdeeds.[157] Considering the events surrounding the coup that led to his father's death, the execution of his half-brother, Edmund, Earl of Kent, by order of Mortimer, Mortimer's contempt for Edward, and Mortimer and Isabella's soon to be born child, Edward had reason to fear the loss of his throne and life.[158] While she continued to live in luxury until her death in 1358, Edward stripped Isabella of her power and much of her land and wealth and exiled her from court.[159] Edward III would rule until 1377.

Unlike his father and mother, Edward III was a skilled and highly popular politician, and his reign is notable for its harmony, with the exception of his final years on the throne and a short period of political unrest in 1340-1341. Ending decades of political upheavals and murders, Edward made skillful use of patronage, bestowing land, annuities and grants of money, to gain the support and loyalty of elites. Edward rewarded those who supported him in his coup, and he granted land to those who once opposed him, helping to win them over. Due to lands gained through political upheavals and confiscating the estates of French religious houses, at the beginning of his reign

[156] Michael Prestwich, *Plantagenet England, 1225-1360* (Oxford: Clarendon Press, 2005), 221-222.

[157] Prestwich, 224. Tyburn is a village in Middlesex county in the northwestern portion of London that was a principle site for public executions.

[158] Ibid., 223.

[159] Waugh, 12.

Edward had substantial acreage of land and resources, which he made wise and prudent use.[160]

The cost of waging war, against both Scotland and France, along with repaying debts and the cost of running the country, put Edward at odds with Parliament in its 1340-1341 session. To help fund his war, Edward borrowed from English and Florentine merchants and moneylenders, collected lay and clerical taxes and seized the nation's wool for export, but he still needed more funds.[161] In order to raise money through taxation, Edward had to gain the consent of the landed elites, who composed the House of Lords. In his struggle to raise funds, allegations of corruption and bribery led to arrests and further accusations that held the potential of Edward losing favor as king and for the war.[162] When the session of parliament ended in spring 1341, it seemed parliament had the upper hand, for Edward conceded to nearly all of parliament's demands in return for their approval to collect taxes.[163] Later in 1341, through a council composed of his supporters, Edward overturned Parliament's 1341 statute, regaining his conceded power and authority. Unlike earlier political crises, such as the one experienced by Edward I in 1297, the crisis of 1340-1341 played out and resolved in parliament, without the threat of civil war.[164] The resolution of this crisis demonstrated Edward's ability to work with parliament so to maintain harmony and stability, and parliament's growing influence and power.

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[160] Prestwich, 267.

[161] Ibid., 269.

[162] Ibid., 275-277.

[163] Ibid., 277.

[164] Ibid., 278.

The major accomplishments of Edward III reign included the defining and unifying the English government, the professionalization and definition of its central government, and war. Edward's report with his ministers built trust and a spirit of cooperation between himself, the nobles, and the church (the Catholic Church was a substantial landowner in England and in Europe).[165] This trust and cooperation allowed Edward to delegate more responsibilities and extract more from his subjects. Edward also sought input from prelates, magnates, gentry, merchants, and communities so to get their consent, helping to win further support for his initiatives, projects, and war efforts.[166] This in turn added to the government's solidarity, and changed and defined its structure.

The landed elite controlled Parliament, composed of the House of Lords and the House of Commons. Over the course of Edward III's reign, the House of Commons matured and gained acceptance as a fixed part of England's government. Unlike the House of Lords, whose membership included the landed elite with inherited titles, elected officials formed the House of Commons. A result of the House of Commons receiving more respectability and voice, communities received a more direct voice in the government.

A testament to the leadership of Edward III was that political stability held during a time of national and international crisis. By autumn 1349, the government continued functioning with limited interruptions.[167] Parliament reconvened in the following year.

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[165] Waugh, 4.

[166] Ibid., 192.

[167] Prestwich, 549 and Robert C. Palmer, *English Law in the Age of the Black Death, 1348-1381: A Transformation of Governance and Law* (Chapel Hill: University of North Carolina Press, 1993), 11.

While England's government revived quickly in the aftermath of the plague, its war efforts took time to recover. In 1355, Edward III led the first large post-Black Death military campaign against France.[168] While population loss hampered efforts to recruit men for war, local disruptions and instabilities made it difficult to obtain the necessary supplies for war.[169] Without a dependable network of resources, Edward could not maintain a large military campaign. The cost of war in taxes, plus poor financing and loans through the Florentine moneylending companies of the Bardi and the Peruzzi, and English nobles, weakened England economically, as did the loss of trade.[170]

Had Richard II proven to be a strong leader like his grandfather or a strong military leader like his father, England may have claimed victory in Edward's war against France, but Richard proved to be weak. The consequence of the Black Death on the war was indirect, caused by the decrease in potential soldiers, reduction of resources, and a general slowing of progress in the war. Considering the number of factors involved, it is perhaps impossible to conjecture how the war would have ended if the plague had not been imported into Europe. Yet had England seen continuing victories under Edward III and Edward the Black Prince, perhaps there could have been successful peace negotiations before his death and a Plantagenet king would have claimed the French throne.[171]

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[168] Prestwich, 550.

[169] Ibid. Military service was on a voluntary basis and, as a source of potential but not guaranteed income, if men could earn enough income with a trade, craft, or labor, they were less likely to enlist. Further, a lord may refuse to send recruits if it goes against his interest.

[170] Ibid., 271 and Charles F. Mullett, *The Bubonic Plague and England: An Essay in the History of Preventive Medicine* (Lexington: University of Kentucky Press, 1956), 28.

[171] The Black Prince shared his father's leadership abilities and was a gifted military tactician. The Prince's victory at Poitiers in 1356 made him a national hero, being labeled, in Arthurian tradition, the

By the end of his reign, Edward III stopped employing the techniques that provided him with success and he receded into weakness; tension and uncertainty marked his final years. As Edward turned 60 years old in 1372, his government faltered, a result of his increasing dementia, the death of his son, the Black Prince (the favored successor), and loss of control of parliament.[172] Fortunately, for England, Edward was at the height of his power and strength during the Black Death. The strength of his leadership in gaining and maintaining the loyalty and cooperation of nobles and gentry and the unification of the government provided needed stability during uncertain times during the close of the fourteenth century and successive waves of the plague. While the reign of his successor, his grandson Richard II, saw political unrest, the government defined and matured under Edward, continued to provide a stabilizing influence in uncertain times.[173]

The plague's mortality also influenced the flow of history by changing power dynamics. The 1152 marriage between affluent and powerful Eleanor of Aquitaine and Henry Plantagenet, Count of Anjou, allowed Henry to claim the English throne, ruling as Henry II until 1189. Two of their sons would ascend to the throne – Richard I the Lion-Hearted and John Lackland. During his reign and that of his son, Henry III, England lost much of Eleanor's vast domain and ancestral territories of the royal family in Normandy

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'boar of Cornwall' as his father was celebrated as the 'boar of Winsor' (W. Mark Ormrod, "The Peasants' Revolt and the Government of England," *The Journal of British Studies* 29, no. 1 (1990): 353). In 1376, one year before Edward's death, the Black Prince died of chronic dysentery contracted during his 1365-1366 campaign, a year before his father's death (Henry Knighton and G. H. Martin, *Knighton's Chronicle 1337-1396* (Oxford: Clarendon Press, 1995), 195 and Arthur S. MacNalty, "The Illness of Edward the Black Prince," *The British Medical Journal* 1, no. 4910 (February 12, 1955): 411).

[172] King, 161-162.

[173] Like Edward II, Richard II was eventually deposed and murdered.

and Anjou to France.[174] In 1342 Edward III, the grandson of Henry III, went to war with France so to reclaim this land, thus beginning the Hundred Years War. In 1348 England, ruled by the Plantagenets, was at a high point in the war, claiming many victories, and it seemed an English king would sit on the French throne. Edward's vision extended beyond claiming the French throne to placing a Plantagenet on other kingdom's thrones, providing unity and alliance for England and expanded power for the Plantagenets.[175] A part of Edward III's plan was the marriage of his daughter, Joan, to the heir of the Throne of Castile, Peter. The premature death of Joan and other members of the Plantagenet line, whether to disease or injury, placed the family's future and power in jeopardy, having a similar effect on other noble lines. Destabilization of the Plantagenet family led to the War of the Roses, a struggle for power between the Houses of Lancaster and York, cadet branches of the House of Plantagenet. This infighting and civil war weakened England's ability to stand against the French, thus allowing France to regain the territories lost to the English.[176] With Richard II's death in 1399, the rule of England by the House of Plantagenet ended and the House of Lancaster claimed the throne.

English Demographics

Analysis of London cemeteries revealed that in the mid-fourteenth century nearly ninety percent of the population died before reaching the age of forty-five; the average

[174] Norman F. Cantor, *In the Wake of the Plague: the Black Death and the World it Made* (New York: The Free Press, 2001), 33.

[175] Ibid., 37.

[176] Ibid., 57.

age being around thirty years old, with men living a few years longer than women.[177] If a person survived to twenty years old, they would likely live to forty-five or fifty, and if they survived to fifty, they would most likely live into old age.[178] After the Black Death, the average life expectancy decreases, but an increase in an individual's life expectancy after the age of twenty.[179]

Determining England's fourteenth-century population is a tricky affair as no complete census exists from this period. While poll tax, church, manorial, and court records give insight into population size, it is an incomplete picture. One method of estimating population is by calculating how much food a country produced and using an average caloric intake to determine the maximum supportable population. This method, as described by historian Michael Prestwich, layers hypothesis on hypothesis, "Estimates are needed of the amount of land under the plow, of the quantity of grain an acre would yield, of the calorific value of medieval grain, and the amount of grain an individual would need for subsistence," along with the productivity of the land.[180] According to Prestwich, using an average of 1500 calories, England's population would be around four million.[181] Considering the population pressure of the time, with a high number of peasants living at or below subsistence level, the average daily caloric intake was

[177] Prestwich, 10. Women, on average, died earlier than men due to complications of childbirth.

[178] Ibid. The lower average is due to the high death rate of children, especially those under five years old, due to illness and accident.

[179] Krzysztof Boroda, "Plague and Changes in Medieval European Society and Economy in the 14th and 15th Centuries," *The Journal of Arts and Science* 10, no. 1 (2008): 57.

[180] Prestwich, 531-532.

[181] Ibid.

probably closer to 1300 calories, which yields a population of 4.81 million.[182] If peasants' fields produced a higher yield than demesne, a population closer to 5.46 million was possible.[183] England's pre-Black Death population was, therefore, somewhere around five million.

As the minimum caloric intake a healthy human requires is 1200, an average of 1300 or 1500 for an active population, gives insight to the general health of the population. Population pressure required an increase in food production, which caused an intensification of agriculture at the cost of animal husbandry.[184] Important consequences pursuing agriculture over husbandry included a diet that consisted mainly of grain crops and a higher dependency on weather-sensitive crops.[185] Dependency on weather-sensitive crops led to a higher risk of famines. Peasants' wages, whether free or unfree, included grains, dairy, and, at times, meat, and they augmented their diet with foods from their own land, animals, such as hens, geese, and fish, and purchased food items, depending on the resources available to them.[186] While after the Black Death people experienced an increase in the availability of food, prior to the plague peasants had limited access to meat, especially amongst landless peasants, such as those who lived

[182] S. Broadberry, B. Campbell, and B. van Leeuwen, "English Medieval Population: Reconciling time series and cross sectional evidence," *University of Warwick unpublished manuscript* (2010), 13.

[183] D. J. Stone, "The Consumption of Field Crops in Late Medieval England," in *Food in Medieval England: Diet and Nutrition*, ed. C. M. Woolgar, D. Serjeantson, and T. Waldron (Oxford: Oxford University Press, 2006), 19 and 21.

[184] Boroda, 50.

[185] At the beginning of the fourteenth century, eighty percent of a harvesters' diet, seventy-eight percent of soldiers', and sixty-five to seventy percent of lay nobility's calories were from grains – namely rye, barley, wheat, and oats (Stone, 11).

[186] C. M. Woolgar, D. Serjeantson, and T. Waldron, *Food in Medieval England: Diet and Nutrition* (Oxford: Oxford University Press, 2006), 271.

in towns.[187] Though rye and barley, the main grain consumed by peasants prior to the Black Death, are good sources of protein, they provide incomplete protein, meaning they do not contain all nine essential proteins that the human body requires to function. As the body requires protein, low protein diets are detrimental, leading to muscle wasting, increased risk of infection, behavioral changes, shock, and death.[188] The medieval diet, along with grains, meats, and diary, also included vegetables, fruits, nuts, and honey, which, in the absence of meat and dairy, holds the potential for turning incomplete protein foods into complete proteins, for example grains and legumes or nuts and legumes are two combinations that create a complete protein. The human body needs a minimum of eight grams of protein per twenty pounds, a minimum the average medieval peasant diet could not always reach as food availability varied across region and season, leading, for many, to a state of chronic or borderline malnutrition.[189] In the wake of the plague, the peasant diet improved due to changes in wages and increase in food availability.

The sharp decline of England's population by the end of the fourteenth century lifted the pressure on the food supply, increasing resources available and providing healthier diets, for example the increase use of wheat and availability of meat and dairy products.[190] While not consistent across age groups, people over twenty years old saw an

[187] Stone, 23 and Woolgar, et al, 271.

[188] Week-Scott, Jennifer (Registered Dietitian). Personal Communication. November 11, 2013. Harvard School of Public Health, "Protein: Moving Closer to Center Stage," The Nutrition Source, accessed December 30, 2013, http://www.hsph.harvard.edu/nutritionsource/protein-full-story.

[189] Week-Scott. Personal Communication.

[190] Woolgar, 271.

increase in life expectancy.[191] The cause of the increase in life expectancy is multifaceted, even a slight betterment of nutritional intake has positive consequences for a populace's physical, emotional, and mental health.[192]

The English Landscape

Warfare, pilgrimages, and trade took people across England, its disputed territories, and outside its borders – to the continent and beyond.[193] While the degree of mobility depended on resources available and situation, it is incorrect to imagine England's population as stationary. Villages, markets, and towns composed England's landscape. Cities and towns as per modern definition did not exist, and function defined towns and not size. Therefore a change in population did not necessarily equate to a change in function.[194] Taking into consideration of criteria such as legal status of residence, economic function, political standing, sense of community identity as well as degree of agrarian dependence, status of the town's market, and general function, there existed around one hundred to one hundred fifty towns in England, with five hundred more having urban characteristics.[195] The population of an average market town in the late-thirteenth century totaled about five hundred; one hundred years later, it decreased to

[191] Boroda, 57.

[192] Week-Scott. Personal Communication. Though people were living longer, the average life expectancy fell due to the increase of children dying due to disease.

[193] King, 11.

[194] Ibid., 18.

[195] Prestwich, 470.

about three hundred.[196] Economically speaking, medieval English towns depended heavily on non-agrarian activities, hosting a greater concentration of skilled craftsmen than smaller agrarian communities. Towns, such as Melcombe Regis, became important centers of trade, and others, like London, held political and cultural significance.

Whereas the composition of town residents includes a mixture of tradesmen, merchants, craftsmen, workers, and servants, residents of rural villages were largely peasants engaged in agriculture. The legal status of an unfree peasant who resided in a town for a year and a day became legally free, resulting in no unfree peasants living in towns.[197] By the mid-fourteenth century, increasing number peasants in rural areas were free, but villeiny still existed.[198] Similar to today, the wealth distribution in cities was uneven, with some individuals holding great wealth while others were quite poor. Wealth determined power, so a small group of elites controlled towns politically and economically.[199] The wealth and prestige of towns varied greatly across England. While not formalized, urban dwellers "divided into three groups, the great men, those of middling status, and the poor."[200] These informal groupings would be the foundation upon which Parliament based the post-Black Death statutes, concerning issues such as dressing according to one's income. Similar to their rural counterparts, lines of social hierarchy deeply divided urban centers.

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[196] Ibid.

[197] Ibid., 474.

[198] A villein is a peasant legally bounded to a lord. Also referred to as a serf.

[199] Ibid.

[200] Ibid.

The typical English village existed as a part of a lord's estate. In this context, estate refers to all the land held by a lord and manor refers to a specific location within the estate. Depending on geographical location, a manor could contain pastures, meadows, woodland, or scrub, but its three essential components included lands granted by the king linked to a lord's title, land owned by the lord (demesne), and tenant land (land held by tenants for rent or service).[201] The villages created by the presence and need of tenants varied in size and in the diversified legal status of its residence. The most basic distinction in legal status was free and unfree. An unfree peasant was bound to service to a lord and could not travel or move off the estate without the lord's consent. Villeins, as per statute, received food, clothing, and shelter from their lords for their services. An unfree tenant worked the lord's land and or paid due to a lord. While bound to a lord, these peasants still had freedom to work their own plot of land for extra resources to augment the food given to them by their lord or to sell. A free peasant was not bound to a lord and usually paid rent for a plot of land, rent paid in goods, services, or currency. Due to the scarcity of land and rarity of vacancies, though a free peasant had the choice to move to another village, this scarcity bound a free peasant in a similar manner as those who were unfree. Depending on the quality of the soil, a peasant needed five to ten acres of land to be at subsistence level, many owned less than five acres.[202] Unfortunately, on average, peasant, whether free or unfree, did not have enough land to be self-sufficient, forcing them to augment their income through wage labor or other

[201] Ibid., 97.

[202] Ibid., 25.

enterprises.[203] Considering the lack of circulating currency, the people paid rent in goods and services. Amongst free peasants, people made distinctions by the size and type of holdings they possessed.[204] Landless peasants had to eke out an existence any way they could.

Due to the scarcity of land, parents passed tenant holdings to one of their children. The passing of land through inheritance created a self-reproducing social fabric built on a stable core of families and traditions.[205] In his analysis of England during the reign of Edward III, Waugh argues, "Peasant families thus lived and worked within a matric of social, economic, and legal customs enforced by the community."[206] The family unit proved essential to the survival of the community.

Medieval English peasant households were not multigenerational. At this time, traditionally, couples had an independent residence before marrying and starting families.[207] Records giving insight into the daily lives of peasants are limited, but what does exist suggests an average household consisted of parents and three to four children.[208] The cost of living and high incidents of disease and accidents restricted the size of families. After the Black Death, the average number of children per family dropped to two, due to repeated epidemics, and, perhaps, the active choice of parents to

[203] Boroda, 51 and Waugh, 25.

[204] Prestwich, 446.

[205] Waugh, 30.

[206] Ibid.

[207] Ibid., 27.

[208] Prestwich, 445.

limit family size so to increase the family's standard of living thus increasing everyone's chance for a longer life.[209]

English Economy

Beginning in the twelfth century, England's international trade grew, its main exports being wool, hides, lead, tin, coal, and cheese.[210] Growth in national, regional, and local trade occurred as the increase in population led to an increase in demand for goods.[211] By the fourteenth century, England had strong trade connections with the Baltic, northwest Europe, and the Mediterranean.[212] By the end of the fourteenth century, due to population loss, England's national and international trade network declined in total volume, while the local trade remained stable.[213] Also, international trade, one means by which to fund military campaigns, was hampered by the lack of bullion in circulation.[214] Throughout Edward III's reign, this dearth of circulating currency hampered not only war efforts, but tax collection and economic growth in general, being one factor in the economic stagnation experience across Europe before the Black Death.

The decrease in availability of food and other resources meant the increase in cost of goods. With overpopulation causing a surplus in available laborers, workers faced high unemployment and low wages. The collapse of England's existing economy was

[209] Boroda, 57.

[210] King, 71.

[211] Ibid., 11.

[212] Ibid.

[213] Ibid.

[214] Prestwich, 269.

inevitable unless it underwent dramatic transformation. Yet in a system deadlocked by overpopulation, such changes would be difficult to impossible, unless the limits on the system changed. The bubonic plague changed the limits on the system by decreasing England's population.

The plague forced England's economy, and the rest of Europe, to modernize, speeding the demise of feudalism and becoming an increasingly consumer and wage-labor economy. While not all members of English society benefitted equally, the poorest members experienced a general increase in the standard of living.[215] A decreasing population during the last half of the fourteenth century meant an increase in demand for labor, which, in turn, shifted the balance of power between lords and peasants. Labor shortages in villages and urban areas gave peasants, whether free or unfree, the option to move to find better work and living conditions. In order to keep and hire laborers, lords began to pay for work that villeins preformed as labor services.[216] Attempts to freeze wages and prices at a pre-1348 level were not successful, demonstrating lords' diminishing power over peasants. The economic upheaval of the early years of the Second Pandemic would eventually settle as changes in population required transformation and innovation, leading to technological advance, such as the printing press, and to changes in agriculture and animal husbandry.

Did Europe experience a consumer revolution in the wake of the demographic devastation of the Black Death? The plague stimulated spending on goods and services as prices dropped and workers' wages rose. The rise in income for peasants and

[215] Boroda, 257.

[216] Mullett, 27.

merchants diversified the goods and services they purchased. Historian Maryanne Kowaleski argues "Many of the key factors of the early modern consumer revolution…can all be identified in the late middle ages," including new attitudes towards spending, increase in material possessions, and consumer demand extending further down the social ladder.[217] The changes in spending, such as in clothing, caused social anxiety resulting in laws, legislation, and moralists' laments. Not all peasants experienced the increase in disposable income and some still lived near, above or below, subsistence level. Furthermore, increased taxation, tithes, court fines, rents, and market tolls also placed constraints on spending.[218]

English Statutes

In 1349 and 1351, Edward III froze wages to the pre-plague level. The population loss caused a sequence of events to occur that further undermined the existing economic system. With labor shortages, the cost of land and food dropped, which adversely affected landowners, especially as laborers demanded higher wages.[219] Edward's labor statutes attempted to return to the older system, which proved, in the long term, futile. In 1363, new laws banned peasants from purchasing or dressing above their station, as the cost of silk, furs, and other items had temporarily dropped in the years after the Black Death, thus allowing peasants the opportunity to purchase items once only available to those economically above them. The three poll taxes levied, by Richard II, between 1377

[217] Maryanne Kowaleski, "A Consumer Economy," in *A Social History of England, 1200–1500*, ed. Rosemary Horrox and W. Mark Ormrod (Cambridge: Cambridge University Press, 2006), 239.

[218] Ibid., 257.

[219] Kelly, 286-287.

and 1381 also attempted to return to pre-plague social structures by taxing rich and poor at the previous rate, in an attempt to reduce the income of the poor.[220]

The plague disrupted existing social structures by upsetting the balance of power created by population pressure. With increase in wages and drop in prices for food and other commodities, those of the middling sort began to dress above their socially perceived station. While clothing was not the only item linked with social status, it was the most blatant affront to preexisting social distinctions. While moralists bemoaned the increasing tightness and shortness of garments, and even cross-dressing, perhaps more of a sign of people's reaction to surviving the plague or social anxiety over rapid social changes than an indication of an increasingly immoral and sinful society.[221] Moralists blamed changes in fashion, namely the copying of noblemen's fashions by peasants, for everything from England's economic and political problems to the downfall of society.[222] The blurring of economically defined lines indicated that existing informal means of social control were no longer effective, mandating formal means, namely statutes.

The first recorded sumptuary laws in England, passed in 1281 and 1309, regulated workmen's clothing. Edward III passed sumptuary laws in 1336, 1337, and 1363, all with the purpose of regulating dress so to maintain class distinction. Along with maintaining distinction by limiting what individuals could purchase and wear based on

[220] Robert S. Gottfried, *The Black Death: Natural and Human Disaster in Medieval Europe* (New York: The Free Press, 1983), 102.

[221] Kowaleski, 259.

[222] Ibid., 248.

income and position, these statutes also attempted to promote and increase the English wool trade and garment industry.[223] For example, the 1363 statute states,

> That People of Handicraft, and Yeomen, shall take nor wear Cloth of an higher Price for their Vesture or Hosing than within Forty Shillings the whole Cloth, by way of buying, nor otherwise; nor Stone, nor Cloth of Silk, nor of Silver, nor Girdle (Knife, button,) Ring, Garter, nor Owche, Ribband, Chains, nor no such other Things of Gold nor of silver, nor no Manner of Apparel embroidered, aimeled, nor of Silk by no Way; and that their Wives, Daughters, and Children, be of the same Condition in their Vesture and Apparel; and that they wear no (veil) of Silk, but only of (yarn) made within the Realm, nor no Manner of Furr, nor of Budge, but only Lamb, Cony, Cat, and Fox.[224]

Fundamentally, as Kowaleski argues, "The laws essentially aimed to regulate desire – particularly among middling sort, made up of the prosperous urban elite and the gentry – by establishing a new cultural order of dress that reflected social distinctions in a time of rapid social mobility."[225] Like other laws seeking to force society back to pre-Black Death social norms, such as the Ordinance of Laborers of 1349 and Statute of Laborers of 1351, the statutes concerning fashion were largely unsuccessful.

The Peasants' Revolt of 1381 may have been the inevitable result of a decaying and dying manorial system and economy, but the Black Death influenced its timing. The manorial system and economy relied on a surplus of population, remove the surplus and the system begins to falter. The transformation of England's and Europe's economy from serfdom to a rent-paying began prior to the Black Death, the population loss caused by the plague quickened this transition by heightening social tensions, contradictions, and grievances, and overall flaws in the system. As the rural peasants moved to cities to take

[223] Sarah K. Silverman, "The 1363 English Sumptuary Law: A comparison with Fabric Prices of the Late Fourteenth-Century" (PhD diss., Ohio State University, 2011), 56.

[224] 1 Statutes of the Realm 380 (1235-1377), Statutes of King Edward the Third.

[225] Kowaleski, 248.

advantage of better paying positions, the countryside lost population so where once land was limited it now became widely available. The lack of workers allowed laborers to set their own prices by either demanding higher wages or by migrating to the locations with best pay. While the peasants wanted to maintain high wages and their mobility, Lords and other landowners wished to return to the pre-plague economic status quo, which they attempted to do through the Statute of Laborers. This worked to a limited degree. The Statute of Laborers begins

> Whereas late against the malice of servants, which were idle, and not willing to serve after the pestilence, without taking excessive wages, it was ordained by our lord the king, and by the assent of the prelates, nobles, and other of his council, that such manner of servants, as well men as women, should be bound to serve, receiving salary and wages, accustomed in places where they ought to serve in the twentieth year of the reign of the king [1346] that now is, or five or six years before; and that the same servants refusing to serve in such manner should be punished by imprisonment of their bodies…[226]

The statute, with its ominous beginning written by the landed elite in Parliament, then set the prices of goods, limited wages, and prohibited peasants from moving to seek better positions. The language of the statute suggests social perceptions of workers as greedy, lazy, and disobedient.[227] The labor shortage allowed workers to demand higher wages and better food, and with the increase in job security due to population loss, workers could choose their work hours. The balance of power favored workers instead of their economic and social superiors, which contradicted pre-plague social norms and thus required, in this case, a legal solution to return society to normal. A form of social

[226] Albert Beebe White and Wallace Notestein, eds., *Source Problems in English History* (New York: Harper and Brother Publishers, 1915), 147.

[227] P. J. P. Goldberg, *Medieval England: A Social History 1250-1550* (London: Arnold, 2004), 10.

control, the labor and sumptuary statutes aided in the process of increasing social stratification that occurred in the wake of the plague.[228]

The Black Death and subsequent outbreaks transformed all areas of English life to some degree, and change on such a scale can be potentially explosive. The Peasants' Revolt of 1381 was a consequence of the plague – the depopulation of the four plague outbreaks since 1350, the labor statutes, the struggle between landlord and unfree peasants, and heavy taxation, as well as the political unrest at the end of Edward III's reign and intense religious debates, are factors leading to the revolt.[229] The inequitable taxes of the 1370s to fund England's failing war with France, combined with increasing restrictions on the rights of peasants, and the Statute of Laborers fueled discontent on a national level. The post-plague Ordinance of Laborers of 1349, Statute of Laborers of 1351 and poll taxes gave rise to the revolt of 1381. The rebels' aims were to abolish serfdom, tithes, poll taxes, and game laws. The Revolt failed, but the system did begin to change. Landowners began to hire stewards to manage their land and to collect rent from tenant farmers.[230] With continued labor shortages, stewards recruited landless peasants and city dwellers to work the land. In addition, due to the shortage of workers and cost of labor, landowners began to transition from labor intensive practices, such as growing grain, to land intensive practices, such as raising sheep and cattle.[231] This transition

[228] Bolton, 45.

[229] Ibid..

[230] Irwin W. Sherman, *The Power of Plagues* (Washington, D.C.: ASM Press, 2006), 80.

[231] Ibid.

eased the labor shortage as it took fewer peasants to raise sheep than to sow and harvest fields. Thus while the Peasants' Revolt failed in its aims, it did mark the end of serfdom.

The Emotional Response

Though pre-modern people witnessed and experienced death in a fashion many in the twenty-first century are unfamiliar with, they had no immunity to the sadness and despair that resulted from death and loss. The Black Death was a juncture from which people described events as happening before or after it. In fourteenth-century Siena chronicler Agnolo di Tura's words, "now, no one knows how to put their life back in order."[232] Though they knew not how, people recognized that they had to continue moving forward. In the wake of the Black Death, the number of weddings increased as widows and widowers remarried out of necessity of economic and familial support or out of desire. With the increase in vacancy of land and the promise of independence, couples married younger. In his chronicle, French Carmelite friar Jean de Venette observed that it seemed every woman was pregnant. While people may not have known how to put their lives back in order, it is clear that over time they did as the social structure surrounding them continued to function even when individuals within it faltered.

What do people's immediate reactions reveal about the scale and trauma of the plague? Chroniclers, across cultures and geographic boundaries, record similar accounts of panic, fear, and abandonment. Accounts written after the first visitation, such as Boccaccio's *The Decameron* written between 1349 and 1351, record not simply the

[232] John Aberth, *The Black Death, 1348-1350: The Great Mortality of 1348-1350: a Brief History with Documents* (Boston: Bedford/St. Martin's, 2005), 82.

memories of the event, but how one remembers trauma, which helps explain apparent exaggerations, such as Boccaccio's observation of pigs dropping dead after rummaging through a victim's clothing.[233] If the trauma was so thorough, abandonment common, and fear so paralyzing, how do we resolve the contradiction between how societies slowed, halted, or collapsed in varying degrees across Eurasian with the evidence societies continued to function? The spread of disease and mortality rates varied widely, as did the plague's time of arrival in locations. Due to these variations, human civilization did not experience a total simultaneous collapse. In England the social, political, and economic structures maintained the system even if parts of it faltered, failed, or collapsed.

In the darkest hours of the Great Mortality, with humanity's complete powerlessness to stem the tide of death, people found it easier to believe, as many chroniclers lamented, all the good had left the world and the future, and humanity's hope, had vanished. Historian Barbara Tuchman describes this as "a kind of dementia of despair."[234] Workers left fields and animals unattended, crops rotted in the fields across Europe and the Mediterranean world due to lack of workers.[235] Nature would reclaim emptied fields and villages. A Bavarian Chronicler of Neuberg on the Danube, wrote in response to the general apathy, "…no one had an inclination to concern themselves about

[233] The plague was imported into the Italian states in 1347.

[234] Barbara W. Tuchman, *A Distant Mirror: The Calamitous 14th Century* (New York: Alfred A. Knopf, 1978), 99.

[235] For example, Ahmed ibn Ali Al-Maqrizi, in "A History of the Ayyibids and Mamluka," and Henry Knighton, in his chronicles, record similar observations about the consequences of the lack of workers during harvest time.

the future."[236] This sense of a disappearing future appears in other writings of the day, for example William de Edyndon, Bishop of Winchester wrote, in a letter to his clergy, "Every joy has ceased in [cities, towns, castles, and villages]; pleasant sounds are hushed and every note of gladness is banished. The have become abodes of horror and a very wilderness; fruitful country place without the tillers, thus carried off, are deserts and abandoned to barrenness" and Muslim chronicler, Ibn Khald-un, who lamented, "Civilization decreased with the decrease of mankind. Cities and buildings were laid waste, roads and way signs were obliterated, settlements and mansions became empty, dynasties and tribes grew weak. The entire inhabited world changed."[237] Other English chroniclers, such as the Grey Friars at Lynn, John Clynn, and Knighton, also reference the disappearing of signs of human habitation, the seeming loss of all things good, and the possibility none would survive.[238]

Why would those supposedly accustomed to death react in such a dramatic and hopeless manner; producing something akin to post-traumatic stress disorder on a national and international scale? While fleeing and abandoning cities, people, and family members contaminated with the plague suggests human survival instinct was strong, the reactions recorded by moralists after the plague suggests the motional connections and interconnections that existed between family and friends, and the sense of self-identity,

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[236] Ibid.

[237] Henry George Downing Living, *Records of Romsey Abbey: An Account of the Benedictine House of Nuns with Notes on the Parish Church and Town (AD 907-1558):* Compiled from Manuscript and Printed Records (Warren and Son, 1906), 120; Philip Ziegler, *The Black Death* (New York: John Day Company, 1969), 170; and Allen James Fromherz, *Ibn Khaldun: Life and Times* (Edinburgh: Edinburgh University Press, 2011), 51.

[238] Knighton is writing at the end of the fourteenth century, but he does describe the disappearance of villages and cities, noting "it is likely that many of those villages will never be inhabited again" (Knighton, 105).

and future hope that existed as a result. People adopted apathy towards death as a coping mechanism.[239]

Considering the unlikelihood of a child reaching the age of five, ten, or twenty, it would be simple to assume medieval society was accustomed to death, which would lead to the conclusion that during the Black Death and after, people's reactions and behavior were self-motivated and selfish. As records concerning the daily lives and emotions of medieval peasants is limited to nonexistent, conclusions about familial structures and bonds have to be analyzed through other sources, such as literature concerning child rearing. The seemingly apathetic and cruel abandonment of children by their parents could indicate instead the severity of the loss and the parents' emotional state, suggesting apathy as a coping mechanism.[240] Or, surrounded by death and uncertainty, the will to survive overrode the familial instinct to protect, for, as psychologist and Holocaust survivor Victor Frankl wrote in *Man's Search for Meaning*, "An abnormal reaction to an abnormal situation is normal behavior."[241]

The Black Death does not appear in artwork until near the end of the fourteenth century. While scholars debate the exact influence the plague had on art, perhaps the more intriguing question is why did it take so long to appear? For DesOreaux, this delay is connected, not to the loss of masters due to the plague, but due to human coping mechanisms; she argues, "Adopting apathy as a protective mechanism caused survivors

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[239] Anna L. DesOrmeaux, "The Black Death and Its Effect on Fourteenth- and Fifteenth-Century Art" (master's thesis, Louisiana State University, 2007), 17-18.

[240] Ibid.

[241] Viktor E. Frankl, *A Man's Search for Meaning: an Introduction to Logotherapy*, trans. Ilse Lasch, rev. ed. (Boston: Beacon Press, 1962), 3.

of the Black Death literally to forget what happened, or at least temporarily to block it from their conscious memory. It can be inferred that this is one reason why there is not much plague imagery in years immediately after the Black Death."[242] By the time plague imagery appeared, due to repeated outbreaks, people adjusted to the presence of the plague.[243] As later outbreaks were milder, the trauma was not as severe and did not invoke the same psychological defense mechanisms. While fear of the plague remained, people grew to accept it as a topic of art. The difference in how soon the plague appears in private and public forms of art is also seen in the aftermath of the Holocaust. Public acceptance of the plague as an art subject indicates the collective healing process that occurred with the passage of time.

While it would seem a society who concluded the plague was a punishment for sins would come out of the Black Death and other plague years with renewed vigor to fight sin, according to contemporaries, sinful behavior only increased. Giovanni Boccaccio, Carmelite friar Jean de Venette, and other contemporary writers shared similar observations of seemingly reckless and sinful behavior in the actions of survivors. Matteo Villani, the chronicler of the plague in Florence and brother to chronicler and plague victim Giovanni Villani, wrote,

> It was thought that people whom God by his grace in life had preserved, having seen the extermination of their neighbors and of all the nations of the world…would become better, humble, virtuous and catholic, avoiding inequities and sins and overflowing with love and charity for one another. But…the opposite happened. Men, finding themselves few and rich by inheritances and successions of earthy things, forgetting the past as if it never was, gave themselves over to the most disordered and sordid behavior than ever before. As

[242] DesOreaux, 19.

[243] Ibid.

> they wallowed in idleness, their dissolution led them into the sin of gluttony, into banquets, taverns, delicate foods and gambling. They rushed headlong into lust…And without any restraint almost all our city [Florence] took up this shameful style of life; the other cities and provinces of the world did the same or worse.[244]

In the mind of a fourteenth-century plague survivor and moralist, the rational and logical response to loss and trauma is repentance and reform. From surviving records, it is clear that just as the Black Death was an experienced shared by all of Eurasia so too was the disappointment at people's behavior in the aftermath. In England Thomas Brinton, archbishop of Rochester, lamented,

> Today the corruption of lechery and the imagining of evil are greater than in the days of Noah, for a thousand ways of sinning which were unknown then have been discovered now, and the sin of the Sodomites prevails beyond measure, and today the cruelty of lords is greater than in the time of David. And therefore, let us not blame the flails of God on the planets or the elements but rather on our sins, saying, as in Genesis, 'We deserve to suffer these things because we have sinned.'[245]

The perhaps exaggerated disappointments of the Church and moralists at the actions of survivors of the Black Death records behavior that is not indicative of humans' sinful nature but and more reflects relief and post-traumatic stress and recovery. For humans, grief and traumatic stress express themselves through emotions, thus while logic dictates not perpetuating the behavior responsible for bringing the plague, in their emotional responses to the grief and trauma plague survivors sought pleasure and relief. Taken in this light, moralists and chroniclers' observations are of survivors celebrating being a live, seeking to numb their grief, and/or trying to figure how to rebuild their lives.

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[244] Herlihy, *The Black Death and the Transformation of the West*, 65.

[245] Rosemary Horrox, *The Black Death* (Manchester: Manchester University Press, 1994), 146.

English people, in general, did not go through a crisis of faith in the aftermath of the Black Death and subsequent outbreaks in the decades that followed.[246] Though, like medical practitioners, the Church was unable to stem the spread of the plague, the medieval church's power did not lessen as a result. Considering the interpretation of individual and collective sin bringing God's wrath, people did not blame the Church as an institution, though the actions of some of the clergy during and after the Great Mortality was widely criticized. If the attitude of theologians during this period is any reflection of the prevailing religious attitude and perspective, the optimism of earlier centuries had given way to pessimism and resignation.[247] This shift in theological climate began before the Black Death and only became more apparent in the social shifts that occurred in the wake of the early years of the Second Pandemic. More influential than the Black Death was the crisis of spiritual authority caused by the Great Schism of 1378, a political conflict, lasting for nearly seventy years, concerning rival claims to the office of the Pope.[248]

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[246] In the 1370s, John Wyclif, or Wycliffe, a university professor, cleric, parish priest at Lutterworth in Leicestershire (1374-1382), and reformer, began to develop a list of indictments against the medieval church and developed a theology of his own, which centered on the belief the Bible mediated the relationship between God and man, not the church (King, 117). As he was challenging the structure, purpose, and existence of the church, many of his ideas were condemned and he, himself, lost his pulpit and was banned from Oxford. His followers, the Lollards, leveled charges against the church that chroniclers, such as Knighton and William of Dene also recorded examples of in the years directly following the Black Death, namely that clergy of all rank used their position more for their own financial gain than for the spiritual growth of their flock (Christopher Harper-Bill, "The English Church and English Religion after the Black Death," in *The Black Death in England, 1348-1500*, ed. Mark Ormrod and P. G. Lindley (Stamford: Watkins, 1996), 90). Wyclif's and the Lollards' charges against the church were echoed in 1517 in Martin Luther's ninety-five theses. Though abuse of power and overcharging for services occurred during the Black Death and its aftermath, the discontent of Wyclif and his followers was not caused by the pandemic, though the occurrences did perhaps serve to bolster their claims.

[247] Harper-Bill, 107 and 83.

[248] Ibid., 83.

English Medicine

Prior to the Black Death, books written on topics from philosophy to medicine to law were in either French or Latin.[249] While universities taught in Latin, children learned in French. French was the language of the nobility, parliament, and the courts. After the Black Death, English began to dominate in all areas. By the end of the fourteenth century, English was the dominate language taught in schools and used in publishing, many works being translated into English as well as first being published in English. Geoffrey Chaucer's *Canterbury Tales* was a part of this trend in writing and publishing literature in vernacular English instead of Latin or French.

Similar to other areas of society, the bubonic plague acted as a catalyst of change in medieval medicine. Doctors' inability to cure or treat the plague revealed a fundamental weakness in their theories of health and disease – the medical theories passed down from Galen, Rhazes, and Hippocrates proved inadequate to treat or cure the plague, and new theories had to be developed. Medicine shifted away from theories of causation to curative measures.[250] Instead of the complex medicine of humors and astrology, more practical medicine was developed, which increased tensions between medical practitioners, such as surgeons, physicians, and apothecaries.

The Black Death greatly influenced the development of medicine. In a thorough and dramatic fashion, the plague demonstrated the weaknesses in European medieval medicine, namely its reliance on causation and its lack of practical medicine. The initial

[249] C. H. Talbot, *Medicine in Medieval England* (London: Oldbourne Book Company, 1967), 186-187.

[250] Sarah Frances Vanneste, "The Black Death and the Future of Medicine" (master's thesis, Wayne State University, 2010), 76.

flurry of writings focused on the cause of the plague, but quickly the focus of medical literature and tractates shifted to prevention and cures, speculative medicine to practical medicine.[251] The transformation of European medicine occurred in the wake of the plague in three general categories: the increased writing and circulation of medical knowledge; growing awareness of sanitation; and the professionalization of medicine.

While early plague tractates focused on the causes of the plague, later tractates focused more on treatment. With each visitation of the plague, medical practitioners gained more firsthand experience, allowing them to develop treatments, which they then published.[252] At the same time, an increasing number authors, scholars, apothecaries, and medical practitioners wrote tractates in vernacular languages instead of Latin, allowing the general populace access to methods, theories, and knowledge once unavailable to them.[253] The entering of the general populace into the discussion and debate of medical treatments for the plague, and other conditions, allowed those without university training to practice medicine. Another result of the increase in plague tractates in the years after the Black Death was a greater reliance and emphasis on observation instead of the theoretical knowledge passed down from Galen and other classical physicians.[254] Though not solely responsible for transforming European medicine, the plague proved instrumental in its development and change by forcing practitioners to create new knowledge based on observation.

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[251] Ibid.

[252] Ibid., 47.

[253] Ibid., 6.

[254] Ibid.

Each visitation of the plague also produced discussion of ways to prevent outbreaks and limit the spread of the disease. Filth theory provided the framework for changing policies regarding the unsanitary conditions prevalent in large towns and cities. Prior to germ theory, people believed that filth created illness, usually in the form of miasmas, or poisonous air. Germ theory connects filth with conditions hospitable to germs that cause disease. Municipal health boards first formed in Florence in 1347 and in Venice in 1348, with a permanent board of health formed in Venice early in the fifteenth century.[255] Stable boards of public health would not form in England until much later, but awareness about the potential danger of pollution of streets and waterways was increasing. This awareness came, not through medical literature and tractates but from statutes and local regulations, which made the connection between unsanitary practices and outbreaks and incidences of disease.[256] These practices and incidences included throwing trash and sewage into waterways and butcher tossing offal and blood into the streets. Similar to other areas of medicine, the plague did not change attitudes about filth, but helped accelerate change by propelling human ingenuity and imagination to find solutions.

During the sixteenth century, the City of London published Bills of Mortality during plague outbreaks. As the name suggests, these publications kept track of the number of people who died and the general cause of death, parish clerks gathered statistics of births and deaths in their parish. After a 1603 plague outbreak, the Parish

[255] Kelly 289 and Gottfried, 123.

[256] Talbot, 166.

Clerks Company published the bills was weekly.[257] Over the centuries, the last one published in 1836, the details included for categories and increased. A rich source of documentation for historians, the purpose of the Bill of Mortality was to help identify plague outbreaks, and other disease epidemics, before they spread across the city. Since records were parish specific, officials could identify where an outbreak started as to prevent it from spreading. Though not linked with the Black Death itself, the plague and the human efforts to prevent pandemics inspired the creation of the Bill of Mortality.

The Black Death undermined the reputation of medical practitioners not only due to doctors' inability to treat or cure the plague but also due to greed (overcharging patients, for example), and some doctors, like clergy, fled. While the aforementioned debate between theory and experience, physicians and surgeons, predated the Second Pandemic, the reoccurrences of the plague shifted the debate in favor of experience over theory, creating a push for the development of more practical medicine.[258]

The push for the professionalization of medicine, as in regulating membership and practice, was in response to the number of layman who sought to practice medicine without proper training, using the published medical literature in circulation. Surgeons took the lead in restoring the image of the medical profession by taking measure to appear more professional and presentable, such as forming guilds and dressing appropriately, and their secondary purpose was to challenge the superiority and position of physicians.[259] Alongside the debate of theory and experience was a struggle for

[257] "Parish Clerks Company History," The Parish Clerks Company, accessed September 22, 2014, http://www.londonparishclerks.co.uk/content/view/10/31/.

[258] Vanneste, 4.

[259] Ibid., 64.

dominance between physicians and surgeons, and with the preference for theory prevalent in medicine, surgeons were at a disadvantage.[260] The increase in quality and quantity of medical literature in circulation changed people's awareness of medicine and freed this knowledge from being the sole property of physicians.[261] In the fourteenth and fifteenth centuries, attempts to pass legislation to regulate the practice of medicine, such as a proposed bill in 1421, proved futile because there were not enough university-trained physicians to meet the needs of the populace.[262] This 1421 petition was the first of its kind in England, and perhaps Europe, after reminding Parliament of the dangers of charlatans practicing medicine, the petition requested "…that no man, of no manner, estate, degree, or condition, practise in [medicine], from this time forward, but he have long time used the Schools of [medicine] within some University, and be graduated in the same; that is to say, but he be Bachelor or Doctor of [medicine] having Letters testimonials sufficience of one of those degrees of the University in the which he took his degree in…" and the consequences of practicing without a license would be long imprisonment and a fine of £40, with women being forbidden to practice medicine.[263] The next century and a half following the Black Death proved vital to the later development of modern medicine because of the shift towards practical medicine, reliant on experience, and the growing professionalization of medicine.[264]

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[260] Ibid., 4.

[261] Talbot, 196.

[262] Talbot, 196 and John H. Raach, "English medical licensing in the early seventeenth century," *The Yale Journal of Biology and Medicine* 16, no. 4 (1944): 268.

[263] Raach, 268-269.

[264] Gottfried, 128.

The Black Death changed England by acting as a catalyst of change. The extreme circumstances of the plague – the threat of widespread death and the large number of people who fell sick and died – could not help but be transformative as it turned people's worlds upside down. As discussed, on the eve of the Black Death, England reached the threshold of change – the existing political, social, and economic systems no longer sufficient– the Black Death provided the means for the country to change without the need for a civil war. Under Edward III, England's government gained greater stability with both houses of parliament taking a greater role and voice in government. Edward's ability to create and maintain harmony in government throughout the majority of his reign provided space for both houses of parliament to mature and define their powers. Similarly, in restoring their image, medical practitioners sought to regulate medicine through statutes, something made necessary by the increase of laymen practicing medicine because of the increase in publishing tractates and other printed materials in English instead of Latin or French. In general, people, especially the political and social elite, sought ways, formal and informal, to retain the distinction between social classes. Overall the English response was more reactive than proactive in response to the plague.

Increased physical and economic mobility changed England's landscape and increased social anxiety as symbols of higher social status were increasingly available to those of lower status. The labor statutes of 1349 and 1351 were attempts to restore England to the pre-1348 social and economic norms; these statutes and other like them failed. The population loss caused by the Black Death and its reoccurrences resulted in a general overall improvement for the Englishmen who survived. While economic and social improvements were not equal across the board and many still lived near

subsistence level, conditions had improved. This general view of English society does little to reveal the inner workings of Englishmen in the wake of the plague. Fortunately the records and writings on the late-fourteenth century provide a window into the minds of Englishmen. Devastated by the tragedy of the Black Death, humans continued forward, pulled onward by the system – social, political, and economic – they had created. Had England's leaders proven to be weak, this system may have collapsed and chaos ensued, but through his strong leadership, Edward III, a symbol of his people and their ideals, held the country together. In the end, the plague as it sped pre-existing social, economic, and political changes, transforming the system that had aided in stabilizing England during the Black Death. Yet perhaps it was not only the social systems that held the English together during the turbulent early years of the Second Pandemic, but also the meaning the system gave the people that allowed them to move forward in the darkest hours of the Great Mortality.

While the plague sped preexisting changes in English society, it is difficult the judge the value of these changes as good or bad. For the peasantry, the plague opened space for mobility, allowing them to seek jobs elsewhere for increased wages, but the transition to land intensive animal husbandry from labor-intensive agriculture meant a decreasing number of jobs. In addition, the decrease in laborers required technological advances in factories, further reducing the number of jobs available. Yet the necessity of improving technology, as well as the desire to control trade routes, led to new inventions in shipbuilding and seafaring technologies, beginning a period of exploration, creating new opportunities and decreasing population pressures in England and in Europe.

Changes in other areas of English life, such as social class distinctions and in the common law, created new challenges and complexities to life.

While the changes to the post-Black Death world can be traced to pre-existing social changes, it cannot be argued that all of them would have occurred without the plague. For example, while the end of feudalism was approaching before the plague, due to a surplus in workers agricultural practices were still labor intensive, the population decrease necessitated a shift to less labor-intensive practices. Certain changes, such as changes in social class distinction and English common law, were conscious decisions made so to take advantage of the opportunities the plague created. These opportunities included physical, social, and financial mobility, increased intellectual dialogue, increased access to literature published in English, as opposed to French or Latin, and the composition of the clergy. The Peasants' Revolt is an example of how people actively sought to use the opportunity for change to better their situation, but, in general, changes occurred in reaction to events instead of people taking proactive measures to change society. In this way the Black Death was not a driving force of change in English society, but a catalyst of change that created opportunities for the English people, whether by choice or necessity, to alter their society.

CHAPTER 4

THE MIGRATION OF SMALLPOX

In 1980 after enjoying a ten thousand-year unbroken chain of infection, the World Health Organization officially announced the eradication of smallpox from nature, existing now only as frozen samples.[265] Smallpox, *Variola major*, the most virulent of orthopoxviruses, is a story one cannot tell without the human presence. The unbroken chain of infection from its emergence to extinction links all humans together. Through this chain, the Hopi experience and other Indigenous peoples around the world is a part of this larger human story of smallpox. The origin of the Hopi smallpox outbreak of 1899 begins within the larger history of smallpox and its migration around the global.

Part I: The Human Story of Smallpox

Variola major entered its new hosts mainly through respiration. Carried by water droplets in one host's breath, a new host breathed in the virus. Entering the new system, the virus began invading cells and replicating itself. As survival is of key importance, it evaded its new host's immune response by blocking the person's innate antiviral responses.[266] Assuming the person was unfamiliar with *V. major*, their immune system left the virus alone as it incubated over the next twelve days. The severity of its act on its host depended on the person's ability to limit viral replication during incubation.[267]

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[265] While the last natural cases occurred in 1975 and 1977, as smallpox can survive upwards of two years outside a human body, it was not officially eradicated until 1979.

[266] Mike Bray and Mark Buller, "Looking back at smallpox," *Clinical Infectious Diseases* 38, no. 6 (2004): 883.

[267] Ibid., 887.

About two weeks after infection, the host developed pustules on the tongue and the throat. When these pustules break open, the patient's breath now carried the virus to potential new victims. To help guarantee its survival, *V. major* entered the next phase – pustules began to develop on its victim's skin in a centrifugal distribution, being denser on a patient's extremities than trunk. The cooler temperatures outside the body enhanced replication and the dried scabs provided another means for *V. major* to spread.[268] If it entered a new host through breath, the virus could evade the person's defenses, which potentially led to the unintended death, yet as the virus could not reuse a person, the death was not lamentable for the virus, if a virus could be self-aware. If the virus entered the body through the skin, its attack loses virulent.

When *V. major* found its way into humans, it began a losing battle for survival. Failing to adapt successfully to its host and to develop a secondary host, it depended on close contact to spread to new hosts. Thus for its survival, *V. major* depended on an unbroken chain of infection, which ultimately led to its eradication.

From infection to the last scab falling off took about thirty days. When an individual contracted smallpox the incubation period averaged about twelve days. For the first twelve days after exposure to *V. major*, a patient did not exhibit signs of illness. During this period, the virus spread through their body, via the sympathetic nervous system, into bodily tissue and organs. Around the thirteenth day, the infected cells burst, flooding the body with the virus.[269] Onset of the illness was sudden and included a high fever, headache, back pain, muscle ache, vomiting, and convulsions. About four days

[268] Ibid., 883.

[269] Daniel T. Reff, "The Demographic and Cultural Consequences of Old World Disease in the Greater Southwest, 1520-1660" (PhD diss., University of Oklahoma, 1985), 178.

after onset, the victim felt better and, about the same time, a rash appeared. The rash developed into pustules and the pain and fever returned. Depending on the severity of the smallpox strain and the strength of the victim's immune system, the pustules could be lethal or merely scarring. If a person survived, about eight or nine days later the pustules dried and crusted. Eventually about two weeks after the pustules appearance, scabs formed all over a victim's body. About three or four weeks later, the scabs fell off, leaving the survivor with some degree of scarring, but their survival gave them a lifelong immunity to smallpox.

Depending on the severity and presentation of the virus, in general, it came in three forms: distinct, confluent, and fulminant. Distinct smallpox, as the name suggests, occurred when the pustules are distinguishable and separate from one another. With cases of confluent smallpox, the pustules merged. In the more rare cases of fulminant, or hemorrhagic, smallpox, patient die before pustules develop. After onset of symptoms, the patient's skin turned deep purple and small blisters developed. Internally and under the skin, the patient is bleeding to death.[270] Sixty percent of patients with confluent smallpox, they died, from dehydration, starvation, or secondary infection.[271] In many cases, secondary infections, such as pneumonia and encephalitis, caused death. Along with attacking the skin, smallpox also attacked, through primary or secondary infection, the heart (myocarditis), brain (encephalitis), throat, eyes, lungs, bones (viral

[270] Patients with this form of smallpox had a high viral load with no little or no antibodies present, a sign that the immune system failed to resist the invasion.

[271] Elizabeth A. Fenn, *Pox Americana: The Great Smallpox Epidemic of 1775-82* (New York: Hill and Wang, 2001), 18 and Kenneth F. Kiple, *Plague, Pox & Pestilence* (London: Weidenfeld and Nicolson, 1997), 74.

osteomyelitis), and other internal organs.[272] As it is a virus, with current medical knowledge, there is no cure for smallpox, but complications due to secondary infections could be limited and prevented with antibiotics. Long-term consequences of smallpox included blindness, sterility in men, loss of hair, and pockmarked skin. For those who survive confluent smallpox, they suffered damage to their eyes and, typically, lost their hair.

In the nineteenth century a milder form of smallpox appeared, called *Variola minor,* or Alastrim. Patients with *V. minor* developed similar to those with *V. major* except the symptoms were not as severe. The mortality rate for *V. minor* was about two percent, as compared to *V. major*'s thirty percent.[273] The origin, its evolution and spread, is unknown, with cases first appearing in the nineteenth century, the first documented case in the Americas was in Florida in 1896.[274] Possibly *V. minor* developed because of the increase in inoculations in the eighteenth and nineteenth century, or due to the virus' life cycle, as smallpox's virulence varied over the centuries. For example Girolamo Fracastoro, prominent Italian physician who developed a theory of contagion in the sixteenth century, listed smallpox as a milder childhood disease, similar to modern day attitude towards chickenpox.[275] By the twentieth century, *V. minor* became the dominant

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[272] Donald R. Hopkins, *The Greatest Killer: Smallpox in History* (Chicago: University of Chicago Press, 2002), 4.

[273] Sergei N. Shchelkunov, Alexei V. Totmenin, Vladimir N. Loparev, Pavel F. Safronov, Valery V. Gutorov, Vladimir E. Chizhikov, Janice C. Knight, Joseph M. Parsons, Robert F. Massung, and Joseph J. Esposito, "Alastrim smallpox *Variola minor* virus genome DNA sequences," *Virology* 266, no. 2 (2000): 361.

[274] Ibid., 361.

[275] Robert McCaa, "Spanish and Nahuatl views on smallpox and demographic catastrophe in Mexico," *Journal of Interdisciplinary History* 25, no. 3 (1995): 418.

form of smallpox, largely due patients' increased contact with people due to the mildness of the virus, causing more people to become infected. The last recorded case of naturally occurring *V. minor* was Somalian cook, Ali Maow Maalin in October 1977.

Only humans could transmit smallpox, there was no animal intermediary.[276] The main method of transmission was the water droplets in a victim's breath; the upper respiratory tract typically being the main site of infection. Other sources of infection included bodily fluids and dried scabs, and corpses of victims. During the incubation period, a victim was not contagious. The victim became contagious just before the appearance of the rash and remained contagious until the scabs fell off about three weeks later.[277] The level of contagiousness decreased during the duration of the illness. While the patient was no longer a source of infection after the illness passed, the scabs remained contagious for up to two years.[278] Long-term abandonment or burning of the blankets and other personal items aided in preventing the spread of the disease.

Origin and Spread

The origin of smallpox, both place and time, is lost to history, but its eradication is well documented. Poxviruses infected vertebrate and invertebrate animals – nearly all forms of life have a pox.[279] Scholars generally agree that some form of pox jumped from animals, whether domestic or wild, to humans after the end of the last Ice Age and

[276] An intermediary is called a vector.

[277] Hopkins, 3.

[278] Steadman Upham, "Smallpox and Climate in the American Southwest," *American Anthropologist* 88, no. 1 (March 1986): 119.

[279] Considering the spread of poxviruses, of the family Poxviridae, and that the virus does highjack a cell's mechanism in order to multiple, it is highly likely that poxviruses are quite ancient in origin.

mutated into smallpox.[280] Due to the increased contact between humans and animals, smallpox, evolving from camelpox, originated from the development of concentrated agricultural villages in Asia or Africa, which had population density large enough to allow the virus to propagate continuously. As major trading centers, the Nile River valley and the Indus River valley are prime candidates for smallpox's emergence.

The subcontinent's long history of agriculture and trade, especially along river and sea routes, results in a long history of disease. Disease traditionally gained a foothold in agricultural societies more than nomadic because permanent settlements allowed for a population density great enough for an illness to become endemic. The fertile Indus River Valley encouraged the development of agriculture, which occurred in the region between 8000 and 5000 BCE. As Donald R. Hopkins, public health historian and global health champion, noted, "Ancient medical writings, Hindu mythology, and Brahmin traditions provide evidence that India was one of the areas affected earliest by smallpox."[281] Medical historian Arthur W. Boylston disagrees with Hopkins' commonly accepted statement, arguing "Although Brahmin tradition and Hindu mythology suggest that smallpox was present in India well before the birth of Christ, there are no historical accounts of the disease there until 1500 AD."[282] As smallpox and measles were often

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[280] Nicolau Barquet and Pere Domingo, "Smallpox: The Triumph over the Most Terrible of the Ministers of Death," *Annals of Internal Medicine* 127, no. 8 (October 15, 1997): 635 and Ann F. Ramenofsky, Alicia K. Wilbur, and Anne C. Stone, "Native American Disease History: Past, Present, and Future Directions," *World Archaeology* 35, no. 2, Archaeology of Epidemic and Infectious Disease (Oct. 2003): 243.

[281] Hopkins, 139.

[282] Arthur W. Boylston, *Defying Providence: Smallpox and the Forgotten 18th Century Medical Revolution* (CreateSpace Independent Publishing Platform, 2012), "Chapter 1: A Universal Affliction," Kindle. Dr. Arthur Boylston is a descendent of Dr. Zabdriel Boylston who was instrumental in the inoculation debate in Boston in the 1720s.

confused for one another, the evidence is inconclusive. Thus if smallpox did not originate in India, India has a long history with the disease.[283]

In Egypt, the first recorded description of smallpox dates back to 1570 BCE in the Ebers Papyrus of the Eighteenth Dynasty, but the description is too vague to be conclusive.[284] Evidence from three mummies, dating from the Eighteenth and Twentieth Dynasties (1570-1085 BCE), suggests the presence of smallpox as early as 2000 BCE.[285] Cuneiform from the Hittite Empire, located in present-day Turkey, Syria, and Lebanon, also records a deadly outbreak of a disease that devastated the Hittites in the fourteenth century BCE, but it is unclear if this disease was smallpox.[286] While earlier outbreaks are up to conjecture due to unclear description and evidence, Eusebius of Caesarea (275-339) recorded the definite description of smallpox in 302 CE in an outbreak in Syria.[287] Records of reoccurring outbreaks appear after 600 CE.[288]

The first documentation of smallpox's presence in China comes from the text *Chou-hou pei-tsi fang* (*Prescriptions for Emergencies*), written by alchemist and physician Ge Hong (281-341).[289] Ge Hong observed,

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[283] Especially considering its long trade history with other highly populated areas, notably the Nile River Valley

[284] Ramenofsky, Wilbur, and Stone, 8.

[285] Suzanne A. Alchon, *A Pest in the Land: New World Epidemics in a Global Perspective* (Albuquerque: University of New Mexico Press, 2003), 17.

[286] Ibid., 17. The pestilence, which raged for twenty years, originated from Egyptian prisoners of war after a Hittite victory against Egypt (Hopkins, 16).

[287] Alchon, 17.The pestilence described by Eusebiua was characterized by a body-wide skin rash, that killed many, and left some survivors blind, which are trademarks of smallpox (Joseph Bryne, *Encyclopedia of Pestilence, Pandemics, and Plagues* (Westport: Greenwood Press, 2008), 679).

[288] Alchon, 17.

[289] Hopkins, 104 and Boylston, loc 125; Ge Hong can also be interpreted as Ko Hung.

> Recently there have been persons suffering from epidemic sores which attack the head, face, and trunk…They have the appearance of hot boils containing some white matter…If not treated early the patients usually die. Those who recover are disfigured with purplish scars which do not fade until after a year…The people say that it was introduced in the reign of Chien Wu when that king was fighting with the Huns at Nang Yang. The name of "Hun pox" has been given to it'"[290]

The reign of Jian Wu, another transliteration of Chien Wu, was from 25 to 56. The Huns who reportedly imported smallpox into China, would later aid in spreading the bubonic plague across Eurasia in the fourteenth century. In 312 a smallpox outbreak devastated China's province of Shensi and the province lost upwards of ninety percent of its population.[291] Due to the density of its population, smallpox was most likely endemic to China by the beginning of the Common Era.[292]

In the sixth century three kingdoms occupied the Korean peninsula: Goguryeo, Baekje, and Silla.[293] During their long history these nations were at intermittent war with one another and with China. By the end of the seventh century, Goguryeo and Baekje would fall to Silla and its ally, the Tang Dynasty of China. In an effort to strength itself by having Japan as an ally, perhaps more than to spread Buddhism, in 552, King Seimei of Baekje sent an emissary to Emperor Kimmei of Japan along with a gold and copper image of Buddha, sacred texts, and a letter praising the merits of this new religion.[294]

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[290] Hopkins, 104; Modern transliteration of Chien Wu is Jian Wu or Jianwu.

[291] Alchon, 31.

[292] Hopkins, 103.

[293] In 562, the Gaya Confederacy was absorbed into Silla.

[294] August Karl Reischauer, *Studies in Japanese Buddhism* (1917; repr., New York: AMS Press, 1970), 80. The specific type of Buddhism King Seimei introduced into Japan was Mahayana Buddhism. In Japanese, Baekje is Kudara. According to the *Jogu Shotoku Hoo*, written between 700 and 715, the first introduction of Buddhism into Japan was in 538, so the 552 is considered the first official and successful attempt to introduce Buddhism.

Uncertain what to make of this new religion, even though impressed by it, the emperor of Japan sought the advice of his chief counselors: Soga no Iname, Mononobe no Okoshi, and Nakatomi no Kamako. According to historical accounts, Soga supported adopting the new religion, as western countries had already adopted it, but Mononobe and Nakatomi argued against its adoption for fear of raising the wrath of Japan's gods; "We have our own gods, and if we now change and worship the gods of other nations we are in danger of bringing the wrath of our gods upon our heads."[295] As the emperor's solution, Soga practiced Buddhism so to test it out. Soon after, a pestilence descended upon the land. Mononobe and Nakatomi argued this pestilence resulted from the Shinto gods' wrath and then burned down Soga's temple and threw the image of Buddha in a canal of Naniwa (Osaka).[296] The pestilence soon grew greater and people recovered the image of Buddha placed in a new temple. While the pestilence in the 550s may not have been smallpox, the pestilence of 585 was most likely smallpox.[297]

After the pestilence that arrived in the wake of Buddhism's arrival and gradual acceptance, Emperor Kimmei had requested King Seimei to send physicians, apothecaries, soothsayers, almanac makers, and artisans instead of priests and images – Seimei sent them all.[298] During this period of increased interaction, along with goods and ideas, people imported smallpox into Korea from China, in about 583, and it soon spread to Japan. Emperor Kimmei died in 571 and his son, Bidastu, soon ascended the throne.

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[295] Ibid., 81.

[296]Ibid.

[297] Hopkins, 106.

[298] Reischauer, 83.

During Bidastu's reign, travelers, merchants, and dignitaries brought more images of Buddha into Japan. Perhaps more to do with the continuing rivalry between the Mononobe and Soga clans than a split along religious lines, people once again blamed Buddhism for the emergence of this new pestilence. Emperor Bidastu, a Buddhist, was Japan's first royal to die by smallpox in 585. Between its large urban centers and continued contact with the continent, smallpox epidemics began an approximate 30-year epidemic cycle.[299] While the complete death toll of early outbreaks is unknown, smallpox outbreaks in Japan during the eighth and ninth centuries decreased its population by one-third.[300]

By 1000 smallpox was endemic in densely populated urban centers across the whole of Eurasia and the Mediterranean World.[301] With increased urban populations came an increase in the frequency and intensity of smallpox epidemics. Like India, the Nile River Valley with its fertile land promoted the development and expansion of agriculture, increasing the number and size of population centers and villages. If smallpox existed in Egypt, outbreaks occurred in other locations around the Mediterranean world, due to their trade connections. Yet due to being thinly populated, smallpox did not become endemic in Europe. A result of the wars in the seventeenth century, typhus, dysentery, plague, and smallpox flourish across the continent and oceans. With the migration and interaction of people, disease rapidly spreads, increased

[299] According to Irwin, the first documented case of an smallpox outbreak was August 735, but that the disease has a much longer history in Japan. From the outbreak he lists, it is clear there is a 20 to 30 year cycle to outbreaks, which is consistent with the periodicity of outbreaks in other nations.

[300] Alchon, 31.

[301] Irwin W. Sherman, *The Power of Plagues* (Washington, D.C.: ASM Press, 2006), 194.

by the poor condition of military camps. While the plague remain a threat through the sixteenth and seventeenth century, smallpox gained dominance as the foremost pestilence of Europe by the end of the seventeenth century.[302]

Though it is difficult to trace smallpox through the historical record, the genetic record of smallpox provides a deeper view of its origin and history. Smallpox is an orthopoxvirus, a subfamily of the Poxviridae, or poxviruses. Viruses are smaller than bacteria and range in size, "poxviruses are the largest and most complex viruses that infect humans. The ability of these double-stranded DNA viruses to replicate in the cell cytoplasm with little help from the nucleus and their present worldwide distribution among mammals, birds, reptiles, and insects suggest that they descended from organisms that infected early forms of life."[303] An example of their size and complexity, smallpox's genome has over 200 proteins, as compared to the Ebola virus, which has 8 proteins, and smallpox is 200nm to 400nm in size, rhinoviruses, that cause the common cold, are about one-tenth this size.[304] Following the genetic history of smallpox, its closest ancestor is the camelpox, which is enzootic to southwestern Asia.[305] Smallpox branched off from camelpox 5,000 to 10,000 years ago.[306]

Regardless of its point of origin, smallpox had quickly spread throughout Europe and Asia, becoming endemic to large cities. Since victims of smallpox gain immunity,

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[302] Hopkins, 32.

[303] Bray and Buller, 882. Smallpox is the most virulent of the orthopoxviruses.

[304] The shape of these viruses differ from one another, whereas smallpox is brick shape, Ebola is long and thin, thus it is difficult to adequately compare their size.

[305] Caroline Gubser and Geoffrey L. Smith, "The sequence of camelpox virus shows it is most closely related to variola virus, the cause of smallpox," *Journal of General Virology* 83, no. 4 (2002): 868.

[306] Ibid.

smallpox only became endemic to cities that had a continual supply of non-immune individuals, such as children and travelers. In large cities and depending on population density, epidemics of smallpox cycled every five to fifteen years. In a community of the mostly immune, smallpox became a childhood illness, similar to chickenpox.[307]

The importation of any disease into a virgin population resulted in high rates of morbidity and mortality. The Plague of Athens in 430 BCE, during the Peloponnesian War, was possibly smallpox or the measles, and resulted in death rates of twenty-five percent and higher.[308] The first substantive, though still controversial, evidence of smallpox in Roman Europe was the Plague of Antonius in 165-180.[309] The Plague of Antonius, an epidemic lasting fifteen years, appeared as Roman soldiers were returning from Syria, in about 164; it quickly swept through Italy and spread into other parts of the

[307] Sherman, 199 and Ramenofsky, Wilbur, and Stone, 8.

[308] Alchon, 31. Thucydides, a careful observer and patient of the illness, recorded the illness so future physicians could identify it. His description foes not fit any one illness perfectly, causing scholars to disagree on what the plague was. Complicating identification of the cause of this plague are reports it also affected animals and birds (P. Salway and W. Dell, "Plague at Athens," *Greece & Rome*, Second Series, 2, no. 2 (June 1955): 63). Further, some fell victim to the illness twice (Salway, 65). Another possible explanation is that the plague was caused by ergot poisoning or vitamin deficiency (Salway, 67-68). It is probably that if the plague was a result of a bacteria or virus, that the causing agent did not survive to the present day, either due to evolving to a milder form or going extinct. The Plague of Athens was a direct result of war. The Peloponnesian War raged from 431 BCE to 404 BCE , a war that pitted Athens against Sparta. To protect the Athenians against the Spartans, whose army was superior to Athens on land, Greek statesman and general Pericles ordered people to find refuge behind the gates of Athens. Refugees flooded the city, increasing density and decreasing food supplies (Burke A. Cunha, "The cause of the plague of Athens: plague, typhoid, typhus, smallpox, or measles?" *Infectious disease clinics of North America* 18, no. 1 (2004): 29). A public health disaster in the making, Athens was primed for an epidemic. The outbreak lasted three years and killed upwards of a fourth of the population and the army (Robert J. Littman, "The plague of Athens: epidemiology and paleopathology," *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine* 76, no. 5 (2009): 456). In 415, Athens's navy suffered defeat at Sicily and forced the war to become a land war, which swayed the war in Sparta's favor. Between defeat and disease, Greece never recovered it former glory (Cunha, 30).

[309] Hopkins, 22.

Roman Empire, killing between three and a half million to seven million people.[310] At its height in Rome, it reportedly killed upwards of 2,000 people per day.[311] Galen's description of patients during the Plague of Antonius were not for allowing future generation to diagnosis or identify the illness but to record treatments and physical effects.[312] Drawing from his observations and his contemporaries, it is likely this plague was smallpox, with a higher incidence of hemorrhagic smallpox. Other possible candidates include the bubonic plague, measles, and epidemic.[313] The combination of rashes, raised lesions, scabs, and diarrhea places smallpox as the most probable candidate, such as a constellation of symptoms described – fever, vomiting, fetid breathing, catarrh, cough, and ulceration of the larynx and trachea – does not often occur with the bubonic plague or typhus.[314] Considering the historic average mortality rate of seven to ten percent during an outbreak, with the average being higher or lower depending on the population density (thirteen to fifteen percent), it is likely, as a conservative estimate, between seven and ten million people died during the twenty-three year period of the outbreak.[315]

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[310] R. G. Robertson, *Rotting Face: Smallpox and the American Indian* (Caldwell: Caxton Press, 2001), 42 and Alchon, 25.

[311] Ibid.. One of the more famous victims of this plague was Roman emperor Marcus Aurelius.

[312] Robert J. Littman and Maxwell L. Littman, "Galen and the Antonine plague," *American Journal of Philology* 94 (1972): 244. Plus, Galen did not remain in Rome during the course of the epidemic, limiting his exposure to the pestilence, as compared to Thucydides in the Plague of Athens during the Peloponnesian War.

[313] Ibid., 245.

[314] Ibid., 249, 252.

[315] Ibid., 254-255.

Treatment

The first physician to differentiate in his writings between smallpox and measles was Abu Bakr Mohammad Ibn Zakariya al-Razi (865-930), commonly referred to as Rhazes. A Persian doctor who worked in the main hospital of Baghdad, an intellectual hub during his lifetime, Rhazes ranks with Hippocrates and Galen as one of the founders of clinical medicine and is regarded as the greatest physician of Islam and the Middle ages.[316] In his description of smallpox in *A Treatise on the Smallpox and Measles* (*al-Judari was al-Hasabah*), one of his nearly 200 treatises and books, he noted how smallpox transmitted person to person and was the first to record a theory of acquired immunity.[317] Along with his many contributions to medicine, Rhazes also made his mark in chemistry, philosophy, ethics in medicine, and metaphysics.[318] His suggested treatment for smallpox used food as medicine instead of complex drug treatments. For example, quoting from his *Treatise*, as smallpox arises "from heat and putrefaction acting upon moisture, those things are more suitable, which have a drying and thickening power together with a cool power, such as water of pomegranates, juice of unripe grapes, and the like…"[319] The humoral theory heavily influenced Rhazes' treatments; a theory that would influence western medicine for centuries.

Throughout human history, people have attempted many methods to treat smallpox stemming from their cultural understanding of disease. These treatments and

[316] Houchang D. Modanlou, "A tribute to Zakariya Razi (865–925 AD), an Iranian pioneer scholar," *Archives of Iranian Medicine* 11, no. 6 (2008): 674.

[317] Ibid.

[318] Ibid.

[319] Abū Bakr Muḥammad ibn Zakarīyā Rāzī, *A Treatise on the Small-pox and Measles* (Syndenham Society, 1848), 65.

preventative measures ranged from offerings to appease a deity associated with smallpox, wearing the color red while ill, purging the body of a humor or offending substances, or cleaning the environment of foul odors.[320] Other treatments include herbal ointments and lotions (West Africa), powdered horse excrement (Brazil), animal fat (Arabia), and a bath in hot water, sake, rice water, red beans, and salt (Japan).[321] Considering the diverse and sometimes extreme treatment options, it is interesting, as noted by Hopkins, that people met Dr. Edward Jenner's use of cowpox with such skepticism and revulsion.[322] Similar to other epidemic diseases commonly employed preventative measures included isolation, fleeing, and quarantine

The perspective of Brahminical Hinduism, in India, of smallpox is unique in the story of human-smallpox relations. Instead of being a divine punishment or trial to endure, in this form of Hinduism, smallpox was a sign of the divine presence of the goddess Sitala.[323] As David Arnold, historian of South Asian history and a founder of subaltern studies, writes in *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India*, "…Sitala was both the course of smallpox and the means of gaining protection from it…The body was Sitala's temple, the shrine at which devotees worshipped and praised an all-powerful but difficult deity."[324] As divine possession, variolation and inoculation – through which a person still underwent the experience of

[320] Hopkins, 11-12.

[321] Ibid., 295.

[322] Ibid., 295.

[323] David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India* (Berkeley: University of California Press, 1993), 120.

[324] Ibid., 124.

smallpox only in a milder form – were religious acts and surrounded by ritual.[325] Therefore devotees saw vaccination with which a person did not experience smallpox as irreligious and as an offense against Sitala. While vaccination eventually replaced variolation, Hindu experience with smallpox demonstrates that there existed no universal or shared cultural understanding of the disease, and that the prevention of smallpox had a similar destructive potential as its spread.

As surviving smallpox provides a life-long immunity to the disease, one viable method of treatment was to infect, intentionally, a non-immune person. Methods included using the ground scabs of a patient with a mild case of smallpox inhaled by a non-immune patient to puncturing the skin and applying fluid from pustules from a mild and active case of smallpox. Variolation, specifically the practice of putting pus or infect materials in a small wound on the arm of a healthy person so to infect them with smallpox, emerged in the sixteenth century. Tracing its history Boylston argues the Arabs invented the procedure sometime before 1550 and then the practice spread through trade routes into Africa, India, and China.[326] Brahmin traditions of ancient treatments are likely myths for would such secrets remain hidden for thousands of years?[327] The earliest recording of variolation in China was a book published in 1549.[328] By the eighteenth century, when the Royal Medical Society began to debate variolation, Christians in Constantinople widely accepted the practice; Muslims rejecting it due to religious beliefs

[325] Ibid., 134.

[326] Boylston, "Appendix 1: Origins of Inoculation."

[327] Ibid.

[328] Ibid.

regarding the divine origin and purpose of disease – to cleanse sin, a predestined fate, or to draw a patient closer to Allah.[329] By 1796 people widely accepted variolation – the practice remained in use in isolated locations around the world until the twentieth century.

The use of cowpox as a vaccine against smallpox gained recognition during the last decades of the eighteenth century. While country doctors and laymen successfully employed cowpox earlier, Jenner introduced a smallpox vaccine to replace variolation.[330] Variolation and vaccination provided a means by which to eradicate smallpox.

Early in the twentieth century, due to vaccination programs, along with improved public health, smallpox was largely eradicated in Europe and North America. By the mid-twentieth century, smallpox was endemic only to isolated regions in South America, Africa, and densely populated regions in India. Through the work of the World Health Organization's Smallpox Eradication Program (1967-1980), led by D. A. Henderson, smallpox, humans eradicated smallpox by 1980. The last naturally occurring case of *V. major* was Rahima Banu of Bangladesh in October 1975 and the last naturally occurring case of *V. minor* was Ali Maow Maalin of Somalia in October 1977. In August of 1978, due to a lab accident infected Janet Parker with smallpox; she subsequently infected her mother. On September 11, 1978, Janet Parker became the last recorded casualty of smallpox. In December of 1979, the World Health Organization officially announced smallpox as extinct in nature. One of the deadliest of human scourges now exists, hopefully, in only two repositories: the Center for Disease Control in Atlanta, Georgia

[329] Ibid., "Chapter 3: A Heathen Practice." See Dr. Ibrahim Abul Hamid Madi's *Islamic Approach to Medicine* for a more thorough explanation.

[330] Cyril W. Dixon, *Smallpox* (London: J and A Churchill, 1962), 249-251.

and State Research Center for Virology and Biotechnology in Koltsovo, Novosibirsk region, Russia.

Once scholars believed that vaccinia, the virus used in the smallpox vaccination, only provided temporary immunity to smallpox, about three to five years, but modern research has proven this wrong. In 2003 medical research proved that for ninety to ninety-five percent of those vaccinated twenty-five to seventy-five years ago still have a high degree of immunity.[331] Essentially vaccinated individuals are still immune to smallpox.

Part II: Smallpox in the Americas

Was the introduction of smallpox into the Americas more deadly than its encounters with other virgin populations? The short answer is no and the long answer is complicated. As will be discussed later, the collision of preadaptation and genetic similarity in the Americas set the ground for a particularly deadly pandemic. Similar to England's experience during the Black Death, difference strains of smallpox, imported from multiple ports led to a widespread and deadly outbreak.

In general, historical documents provide a glimpse at smallpox's death toll throughout the ages, but, due to inaccuracies and uncertainties, scholars cannot determine its mortality rate or total death toll. Early records specific to North America are extremely limited. Scholars' estimates of the pre-1492 population of the Americas fall victim to these same inaccuracies and uncertainties of smallpox's historical mortality

[331] Erika Hammarlund, Matthew W. Lewis, Scott G. Hansen, Lisa I. Strelow, Jay A. Nelson, Gary J. Sexton, Jon M. Hanifin, and Mark K. Slifka, "Duration of antiviral immunity after smallpox vaccination," *Nature Medicine* 9, no. 9 (2003): 1134.

rate. The inclusion of factors such as preadaptation, genetic homogeneity, susceptibility, mortality rates, and secondary consequences of epidemic, increase population estimates from anthropologist Alfred L. Krober's 1939 estimate a little over eight million to anthropologist and ethnohistorian Henry Dobyns' 1966 estimate of around 100 million.[332] Though the number dead indicates the scale of disease, it does not tell how disease impacted people and their cultures.

In regular smallpox outbreaks, only members of the populations who are not immune are at risk of infection, limiting the overall rate of infection for the population and leaving enough members well enough to be caretakers and allow society to continue functioning. Yet outbreaks in a population where none are immune can see infection rates upwards of eighty percent, with a devastating death toll.[333] Outbreaks of smallpox amongst Indigenous people saw mortality rates of fifty percent and higher.[334] While census data from early outbreaks does not exist, it is possible, through use of Spanish records to deduce a probable death rate. Looking at more recent outbreaks within communities with immune members, it is possible to conjecture on the death rate of epidemics in virgin communities. In the smallpox outbreak of 1837-1838 on the Great Plains, the Mandan tribe lost between eighty and ninety percent of its population.[335] In

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[332] Douglas Ubelaker, "North American Indian Population Size: Changing Perspectives," in *Disease and Demography in the Americas*, ed. John W. Verano and Douglas H. Ubelaker (Washington D.C.: Smithsonian Institution Press, 1992), 171.

[333] Fenn, 23.

[334] Ibid.

[335] Other tribes lost between twenty-five to seventy percent of their population during this epidemic. Death was due not only to the virus itself but also to suicide, starvation, accidental drowning, and pneumonia. R. G. Robertson's book, *Rotting Faces: Smallpox and the American Indian*, traces this epidemic in detail, following the path of infection to the aftermath of the epidemic.

the Hopi smallpox outbreak of 1899, the death rate of individuals rejecting western medical treatment was seventy-four percent of documented cases.[336] While the percentage of immunity varied in each of these populations, it is evident smallpox remained a virulent killer until its eradication.

In addition to smallpox's high mortality rate due to its introduction into a new population, genetics influenced the virulence of the virus. According to the science of genetic mapping, people began migrating to the Americas, either via the Bering Strait or/and along the Pacific coast, between 20,000 and 55,000 years ago.[337] Other methods provide different dates, for example, skeletal remains and Clovis Lithic artifacts provide a date of 13,000 to 14,000 year ago, archaeological studies about 33,000 years ago (North American sites about 25,000 years ago), and mitochondrial DNA studies about 35,000 years ago.[338] While there is no a clear consensus on the size of the migrate population, genetic evidence suggests two or three migrations instead of a single mass migration.[339] In the "Out of Beringia" model, around 60,000 to 11,000 years ago Beringia could have sustained life. During this period, people began migrating southward, either by land or by seacoast. The collapse of the Laurentide and Cordilleran ice sheets, about 14,000 to

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[336] E. Wagner Stearn and Allen E. Stearn, *The Effect of Smallpox on the Destiny of the Amerindian* (Boston: Bruce Humphries Publishers, 1945), 110.

[337] Sandro L. Bonatto and Francisco M. Salzano, "A single and early migration for the peopling of the Americas supported by mitochondrial DNA sequence data," *Proceedings of the National Academy of Sciences* 94, no. 5 (1997): 1866.

[338] Antonio Torroni, Theodore G. Schurr, Chi-Chuan Yang, Emoke J. Szathmary, Robert C. Williams, Moses S. Schanfield, Gary A. Troup, William C. Knowler, Dale N. Lawrence, and Kenneth M. Weiss, "Native American mitochondrial DNA analysis indicates that the Amerind and the Nadene populations were founded by two independent migrations," *Genetics* 130, no. 1 (1992): 153.

[339] Sandro Bonatto and Francisco Salzano, in their 1997 article "A Single and Early Migration for the Peopling of the Americas Supported by Mitochondrial DNA Sequence Data," argue for a single early migration.

20,000 years ago, cut the northern and southern populations off from one another.[340] Due to the isolation, northern and southern genetics, over the millennium, diverged. In this model, as with others, the Indigenous populations of the Americas came from a limited genetic pool, which was then isolated, preventing further introduction of genetic material. Genetically speaking, prior to 1492, the population of the Americas was homogenous, in comparison to Eurasia and Africa.

Genetic homogeneity is problematic because of viruses' ability of "preadaptation." Similar to how a human immune system adapts to fight off infections, a virus gains familiarity with its host genetic characteristics. In other words smallpox adapted to a victim's immunological response making it better prepared to fight against the immune response of a victim of similar genetic makeup.[341] When the virus spread to a host with similar genetics, it was better adapted and became more virulent. In a large genetically similar population, a pre-adapted virus becomes as it gains strength, and becomes increasingly virulent. These factors make reports of smallpox epidemics' having a high death toll, seventy-five percent and higher, plausible.

The Indigenous peoples of the Americas, like humans around the world, died of disease, famine, and violence. While the specific illnesses may have differed, in general deaths occurred due to acute respiratory and gastrointestinal infections. While the pre-contact Americas lacked the deadly illnesses rampant in Europe and Asia, it was not a

[340] Bonatto and Salzano, 1870. A computer model by Sijia Wang, et al. ("Genetic Variation and Population Structure in Native Americans." *PLoS Genetics* 3, Issue 11 (Nov. 2007): 2049-2067) supports Bonatto and Salzano's thesis.

[341] Robert McCaa, "Spanish and Nahuatl Views on Smallpox and Demographic Catastrophe in Mexico," *Journal of Interdisciplinary History* 25, no. 3 (Winter 1995): 419 and Francis Black, "Why Did They Die?" *Science*, New Series, 258, no. 5089 (Dec. 11, 1992): 1739.

disease-free Eden. "New" World diseases: American leishmaniasis; Chagas disease (American trypanosomiasis; prevalent in tropical zones); Rocky Mountain Spotted Fever (found throughout the Americas); Carrion's disease (Bartonellosis); except for Spotted Fever, these are chronic conditions that are seldom fatal by themselves, they do compromise an individual's health, thus elevating mortality rates during times of epidemics or famine.[342]

Hunter-gatherer societies, due to size and isolation, rarely experience outbreaks of epidemic diseases, if they do, it occurs due to contact with a larger infected community. Leading causes of deaths in small mobile groups include respiratory and gastrointestinal illnesses, such as pneumonia, tuberculosis, trypanosomiasis, and leishmaniasis.[343] Along with these illnesses, skeletal remains also indicate death due to complications in childbirth, traumatic injury, or battle were also frequent causes of death.[344]

In 1507, Spanish explorers imported smallpox into Hispaniola, sparking a devastating epidemic on the island. The second epidemic on Hispaniola began in December 1518, first appearing among African slaves. By the beginning of summer, nearly one-third of Hispaniola's Indigenous population succumbed to smallpox. The outbreak also spread to Cuba in 1518 and Puerto Rico in 1519, killing upwards of fifty percent, or more, of its population in a few months.[345] Spanish conquistadors, who brought smallpox to the Americas, chronicled the first smallpox epidemics in the

[342] Alchon, 44.

[343] Ibid., 44-45.

[344] Ibid., 45.

[345] Hopkins, 205.

Americas; the first record of smallpox in central Mexico is a report to Charles V by Vazquez de Ayllon, judge of the Real Audiencia of Santo Domingo, dated 30 August 1520.[346] Spanish explorers unintentionally imported smallpox onto the American continent in 1519, and perhaps more than any disease, played a key role in the European conquest of the Americas. By early 1520 smallpox reached the mainland and spread across the Americas. The year 1521 marked the first pandemic of an imported disease. Prior to 1518, Indigenous communities had not experienced an epidemic or pandemic disease on this scale. With a few exceptions, for example the Aztec codices, the Indigenous perspective of the first epidemics of imported disease is unknown.

The Aztecs were the first recorded Native people on the continent to experience an outbreak. Due to lack of immunity and preadaptation of *V. major*, at least half of the Aztecs who caught the virus succumbed to it. Further, as a crowd disease, its impact on the population Technochiltan and other Aztec urban centers exceeded the devastation the disease had on the island of Hispaniola, Puerto Rico, and Cuba.[347]

In their first conflict with the Aztecs, Hernan Cortez and his men lost badly. Years later, on August 21, 1521, when he returned with his men to Tenochtitlan, they observed how a disease, most likely smallpox, had decimated the city's population. In his eyewitness account, Bernal Diaz del Castillo wrote, "I solemnly swear that all the houses and stockades in the lake were full of heads and corpses. It was the same in the streets and courts…We could not walk without treading on the bodies and heads of the dead Indians. I have read about the destruction of Jerusalem but I do not think the

[346] McCaa, 401.

[347] Hopkins, 207.

mortality was greater there than here in Mexico…Indeed the stench was so bad that no one could endure it…and even Cortes was ill from the odors which assailed his nostrils."[348]

In book twelve of the *Florentine Codex*, Franciscan Friar Bernardino de Sahagun recorded the Nahuatl account of the 1520 epidemic.[349] As translated from the Nahuatl recorded by Sahagun, the account reads

> Twenty-ninth chapter, where it is said how, at the time the Spaniards left Mexico, there came an illness of pustules of which many local people died; it was called "the great rash" [smallpox].
>
> Before the Spaniards appeared to us, first an epidemic broke out, a sickness of pustules. It began in Tepeilhuitl. Large bumps spread on people; some were entirely covered. They spread everywhere, on the face, the head, the chest, etc. [The disease] brought great desolation; a great many died of it. They could no longer walk about, but lay in their dwellings and sleeping places, no longer able to move or stir. They were unable to change position, to stretch out on their sides or face down, or raise their heads. And when they made a motion, they called out loudly. The pustules that covered people caused great desolation; very many people died of them, and many just starved to death; starvation reigned, and no one took care of others any longer.
>
> On some people, the pustules appeared only far apart, and they did not suffer greatly, nor did many of them die of it. But many people's faces were spoiled by it, their faces and noses were made rough. Some lost an eye or were blinded.
>
> …And many were disabled or paralyzed by it, but they were not disabled forever.[350]

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[348] Sherman, 191.

[349] The *Florentine Codex* is a sixteenth century ethnographic study of the Aztec, or Nahuatl, compiled by Sahagun after more than thirty years of research. The more than 2,400 pages are broken into twelve thematic books, and includes more than 2,000 illustrations. Sahagun approach echoes many modern ethnographic and anthropologic approaches, such as using firsthand accounts and writing from a Nahuatl perspective, and wrote in Nahuatl and Spanish.

[350] James Lockhart and Bernardino de Sahagún, *We People Here: Nahuatl Accounts of the Conquest of Mexico* (Berkeley: University of California Press, 1993), 182.

In the following centuries, European colonists and United States citizens would record similar observations of the devastating impact of smallpox on Native communities, such as William Bradford's 1634 description of a smallpox outbreak among the Narragansett.

The history of disease is ripe with examples of how the psychological impact of disease can devastate a community more than the disease itself. Greater still, when a large percentage of the population falls ill to the disease, the lack of nursing care proves fatal. When a society ceases to function, long-term preparation ceases with it – people do not plant or harvest crops, they do not manufacture goods, trade comes to a standstill, and the future seems dim. Despair and hopelessness do not provide the strength needed to fight off attacks by one's enemies. Tenochtitlan and the Aztec empire did not fall due to Cortez's superior numbers or military skill, the psychological and physical damage of smallpox weakened them from within.

The scenes of death lingered not only in the memories of the Spanish witnesses but also etched into the memories of the Native survivors of the first wave of the Smallpox pandemic. Historian Robert McCaa demonstrates, by use of twenty-six early colonial account of the conquest of Mexico, ranging in date from 120 to the end of the seventeenth century, the psychological impact and severity of the 1520 smallpox pandemic.[351] While he concludes that the death toll from smallpox was not as high as fifty percent, nor as low as ten percent, he argues that the psychological impact of the pandemic lingered on public consciousness, both Native and Spanish, for centuries.[352]

[351] McCaa, 400.

[352] Ibid., 429-430 and Alchon, 66.

Having no cultural or social context or experience with large scale pandemics of disease such as smallpox and with the enormity of sickness and death, communities were overcome, similar to what Boccaccio records of Genoa during the Black Death, with shock, panic, and fear. These emotions are paralytic to a well-functioning society, the social upheaval and disruption that followed in the wake of disease made the deadly pandemic worse. With people taking flight, whether fleeing to nearby villages or committing suicide, the sick far outnumbered those remaining behind, and with caretakers also falling ill, there were few to care for the sick, causing many who did not die of the primary infection of smallpox to perish due to starvation or dehydration.[353] The risk of death due to secondary infection increased for individuals without proper care. Without a sufficient workforce to manage the fields, survivors faced famine and starvation. The Aztec's horror and suffering at the hands of smallpox repeated in other Indigenous communities as the virus spread throughout the Americas. Unlike the virus's spread into virgin populations throughout the Eurasian continent, into cultures with experience with other epidemic and pandemic diseases, the peoples of the Americas had no prior experience. Therefore while the death caused by smallpox in new communities was similar, the psychological trauma and scarring was perhaps greater in the Americas.

The 1520 pandemic of smallpox in the Americas sparked the first of many pandemics and epidemics. One unique feature of the importation of disease into the Americas was that whereas Eurasia had time between major pandemics and epidemics, waves of disease in the Americas happened in quick succession. Along with smallpox, measles, influenza, mumps, typhus, cholera, bubonic plague, malaria, yellow fever,

[353] Fenn, 24.

scarlet fever, whooping cough, and diphtheria took their toll on Native people and communities.[354]

Similar to the Black Death, trade routes in the Americas played a key role in the spread of smallpox and other imported diseases. It often took a year or two for diseases in Mesoamerica to spread northward, though it is not certain the exact route and timing of the epidemics travel and arrival.[355] Through trading routes and fleeing people, smallpox spread ahead of the Conquistadors as they explored their new world. Francisco Vazquez de Coronado led the first expedition into the Southwest in 1540-1542. The next expedition into the Southwest was not until the Rodriquez-Chumascado expedition in 1581. The first clear record of an epidemic of smallpox was in 1780.[356]

The gap between Coronado's and Rodriquez's expeditions is large enough for a smallpox epidemic to have gone unrecorded. Using data post-1780 data, Henry Dobyns calculated the periodicity of smallpox epidemics to be, on average, eighteen years.[357] To address the debate of when smallpox arrived in the Southwest, anthropologist Steadman Upham analyzed the conditions that favored smallpox's long-term survival outside the human body. The most favorable condition for smallpox's survival, outside the human body, are in temperature between 53.8º F and 71.6º F, with a relative humidity of thirty-five to sixty-five percent.[358] Allowing for seasonable variation, these favorable

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[354] Ibid., 6.

[355] Reff, "The Demographic," 195.

[356] Debates amongst demographers Henry Dobyns, Daniel Reff, and Anna Ramenofsky reveal the difficulty of dating the arrival of smallpox into the southwest. If smallpox did not arrive in in the 1520s, it most likely had arrived by 1650.

[357] Ibid. The population density in the Southwest was too low for smallpox to become endemic.

[358] Ibid., 119.

conditions exist in the Southwest at elevations between 2,000 and 6,000 feet.[359] According to Upham, "These data suggest that once smallpox entered the Southwest, climatic conditions favored its continued survival."[360] Considering the size of the Southwest and the limited presence of Spanish settlers, it is probable early smallpox epidemics went unrecorded.

When smallpox and other imported diseases arrived in the Greater Southwest is unclear. Dobyns asserts that smallpox reached this area a few years after the Spaniards imported it into Mesoamerica. Thus the seemingly healthy and prosperous Pueblos recorded by early Spanish expeditions in the sixteenth century represent only a remnant of pre-contact Puebloan groups.[361] Upham argues it reached the Pueblos sometime between 1541 and 1580 due to of Spanish expeditions into the region. Intermittent contact with Europeans began with Marcos de Niza's arrival near Zuni in 1539 and then prolonged contact with Juan de Onate's founding of a permanent Spanish settlement near San Juan Pueblo.[362] The Pueblo Revolt only temporarily cut direct contact with the Europeans until the Spanish reconquest in 1692 and permanent residency. While the extent of trade networks between the Greater Southwest and Mesoamerica remains unclear, even before Spanish invasion, a trade network existed within the Greater Southwest. Archeological evidence does suggest and exchange of goods from and into Mesoamerica but the longevity and reliability of the trade routes is questionable. While

[359] Ibid., 124-125.

[360] Ibid., 125.

[361] Ann L. W. Stodder and Debra L. Martin, "Health and Disease in the Southwest Before and After Spanish Contact," in *Disease and Demography in the Americas*, ed. John W. Verano and Douglas H. Ubelaker (Washington D.C.: Smithsonian Institution Press, 1992), 56.

[362] Ibid., 60.

trade between Mesoamerica and the Greater Southwest is questionable, local trade routes, especially between the Pueblos of New Mexico and Arizona, existed long before the arrival of the Spanish. With the arrival of the Spanish, trade networks between regions solidified.

Epidemics rarely contained a single illness.[363] While Spaniards imported many diseases, the largest killers were smallpox, measles, influenza, and the bubonic plague.[364] Spanish conquistadors were not "statistically minded" or careful observers, which complicates scholars attempts to reconstruct early contact history.[365] When chroniclers recorded an illness as *viruelas*, it could have referred to measles, chickenpox, typhus or smallpox.[366] Yet, due to the prevalence of smallpox, *viruelas* usually meant smallpox.[367]

Due to the purpose of their expeditions (for glory and gold), it would be easy to discount conquistadors' observations about Native population. While population estimates may be suspect for reasons other than exaggeration, they do provide a useful glimpse into the early contact period. One cannot reject these observations without explanation for each case. Spanish "horseback" estimates of pandemics reported mortality rates of thirty to fifty percent from smallpox.[368] While these estimates seem high, the first epidemic of the Black Death in Europe killed the same percentage of

[363] Alfred Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport: Greenwood Press, 1972), 43.

[364] Henry F. Dobyns *Their Number Become Thinned: Native American Population Dynamics in Eastern North America* (Knoxville: University of Tennessee Press, 1983), 16 and 18.

[365] Ibid., 13.

[366] Crosby, 43.

[367] Ibid.

[368] Dobyns, 13. "Horseback" refers to Spanish expeditions' rough population estimates from general observations.

Europe's population. In addition, smallpox's mortality rate included death due to secondary illnesses such as pneumonia. In cases where entire villages became ill, some victims died from dehydration due to lack of caretakers. Depending when an epidemic struck, failure to sow or harvest caused widespread starvation. Moreover, as mentioned, different strains of smallpox have different death rates. While Spaniards estimated death rates of upwards of fifty percent, there is also evidence for even higher death rates amongst Native communities.

The Medieval Optimum (950 CE to 1250 CE) resulted in warmer and wetter weather across the northern hemisphere. Speleologist Victor Polyak and paleoclimatologist and geologist Yemane Asmerom argue, using growth rings of columnar stalagmites in caves of the Guadalupe Mountains, that from the middle to late Holocene until about 800 years ago, the southwest was slightly wetter than it is in present day, and that "Greater than present-day wetness persisted until ~800 years B.P. [1200 CE], after which conditions became as dry or drier than present-day conditions. A ~300-year period of slightly greater than present-day moisture occurred between 460 and 170 years B.P. [1540 to 1830], with the most notable increase in annual precipitation during the interval from 440 to 290 years B.P. [1560 to 1710]."[369] Tree-ring studies, using data from across North America, reveals that a megadrought, far exceeding any droughts of the twentieth century, in the sixteenth century that lasted in different locations for decades.[370] The megadrought lasted from the 1550s until the 1590s in the southwest.[371]

[369] Victor J. Polyak and Yemane Asmerom, "Late Holocene climate and cultural changes in the southwestern United States," *Science* 294, no. 5540 (2001): 150. We are currently in the Holocene geological epoch, which began about 12,000 years ago.

[370] David W. Stahle, Edward R. Cook, Malcolm K. Cleaveland, Matthew D. Therrell, David M. Meko, Henri D. Grissino-Mayer, Emma Watson, and Brian H. Luckman, "Tree-ring data document 16th

Inspired by Alvar Nunez Cabeza de Vaca and Estevan's 1536 report of what they had learned and heard during their eight-year long trek from Florida to Mexico City, a result of their ill-fated mission gone awry. In 1539 Franciscan Marcos de Niza and Estevan went northward along the Rio Grande to seek Cibola, leading the first (official) expedition into what is now the American Southwest and made limited contact with the people of the region. From Niza's faulty report of seeing Cibola, Francisco Vasquez de Coronado led an expedition in 1540-1542 to find and conquer Cibola. His expedition ended in failure. Between 1540 and 1598, about a dozen pueblo communities had been abandoned, a result of prolonged drought causing crop failures for pueblos using dry farming techniques and their merging with pueblos closer to rivers, and, possibly, imported disease.[372]

In 1598 Juan de Onate founded the first Spanish colony, Santa Fe, near Ohkay Owingeh (San Juan) Pueblo. Due to factors such as weather, disease, and mistreatment at the hands of Spanish colonists and missionaries, between 1600 and 1643 roughly half of the Puebloan settlements had been abandoned.[373] The first recorded smallpox outbreak amongst the Pueblos was in 1636, followed by another epidemic of an unknown disease in 1640.[374] The blanks that exist in the historical record during the seventeenth century

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century megadrought over North America," *EOS, Transactions American Geophysical Union* 81, no. 12 (2000): 121. The megadrought affected different locations in different decades, beginning in Mexico in the 1540s until the 1580s and reaching Montana and Wyoming in the 1550s, lasting until 1600s.

[371] Ibid.

[372] Albert H. Schroeder, "Shifting for survival in the Spanish Southwest," *New Mexico Historical Review* 43, no. 4 (1968): 295-296 and Upham, "Population and Spanish Contact in the Southwest," 227.

[373] Alchon, 95-96 and Stodder and Martin, 66. Population estimates for the eastern and western Pueblos is between 100,000 and 200,000 (Upham, "Population," 230).

[374] Alchon, 95-96.

do not necessarily indicate a lack of epidemics, but are a result of the burning of church records during the Pueblo Revolt of 1680 – church death records would have aided in understanding the cycle of epidemics amongst the Pueblos. After the Spanish return in 1696, records indicate that during the eighteenth century there were twelve epidemics and in the nineteenth century of which nine were recorded epidemics.[375]

The Hopi Tribe is an alliance of autonomous villages that share political, economic, cultural, and social ties, which is also true of other Puebloan peoples in the American Southwest. For the Hopi, clan affiliation, and the society they are inducted into when they come of age, is of higher importance than tribal affiliation. Each Hopi is a member of their mother's clan; the names of clans include Bear, Rabbit, Spider, Grease-wood, Badger, and Coyote. The traditional Hopiland, according to Hopi migration stories, extends over much of northern Arizona and New Mexico and parts of Utah and Colorado. The Hopi Reservation, created by Executive Order in 1882 and redefined by the Navajo and Hopi Land Settlement Act of 1974 (Public Law 93-531) and the Navajo-Hopi Land Settlement Act of 1996 (Public Law 104-301), is located in northeastern Arizona an island in the sea of the Navajo Nation. The reservation encompasses nearly 1.5 million acres. According to the 2010 U.S. Census, the current population living in Hopiland is 7,185.[376]

With the exception of the villages of Upper and Lower Moenkopi, which are near Tuba City, the twelve Hopi villages are still located on or at the slope of the three

[375] Ibid.

[376] Arizona Rural Policy Institute, Center for Business Outreach, W. A. Franke College of Business and Northern Arizona University, "Demographic Analysis of the Hopi Tribe Using 2010 Census and 20120 American Community Survey Estimates," Online. Arizona Commission of Indian Affairs. Available: http://azcia.gov/Documents/Links/DemoProfiles/Hopi%20Tribe.pdf [Accessed 16 July 2014].

sandstone mesas. These three mesas are at the southernmost part of Black Mesa. The villages located on the mesa tops are about six hundred feet off the valley floor at an elevation of 5,000 to 6,000 feet above sea level. The Hopi moved their villages to the mesa tops for protection after the Pueblo Revolt of 1680, as the mesas provide expansive views of the surrounding areas, including the San Francisco Peaks prominent on the western horizon. Also visible are fields of corn and other crops, located in arroyos, or washes, on the desert floor; due to lack of water and thin soil, the mesas tops are not hospitable to growing crops. A high desert, located in a rain shadow of the Sierra Nevada Mountains and the Mogollon Rim, Hopiland receives less than ten inches of precipitation a year, resulting in sparse vegetation, such as pinyon, juniper, and sagebrush. The extremes of the environment – winter lows and summer highs, minimal rainfall, and sparse vegetation – require people to live in balance with their environment. Further, the realities of living in an arid environment requires inhabitants to live also in balance with themselves, and others.

Throughout the long history of human settlement in the region, the number of communities expanded or contracted depending on environmental and human conditions. In many of the origin stories of the region, established communities commonly absorbed wandering clans, when both found the arrangement favorable, or for communities to split due to tensions or other factors. The average Puebloan community had a population below what was required for a disease, such as smallpox, to become endemic, but the structure and density of communities provided many opportunities for communicable diseases to spread. The local trade network aided the spread of disease between the Pueblos. The increased number of abandoned Pueblos during the seventeenth century,

though influenced by climatic changes, occurred in response to the population collapse caused in the wake of disease. The Spanish demand for labor and resources, along with drought and famine, increased the strain on the already tenuous system, leading to an increase in the susceptibility to disease, both endemic and imported. The prevalence of raids and traditional animosities between groups placed weakened and reduced populations at risk, necessitating the absorption of people and abandonment of communities. This movement of people also increased the likelihood of the spread of disease.

The Eastern pueblos, those along the Rio Grande River in New Mexico, had the most contact with Spanish colonists, as Spanish settlement were built close to the pueblo communities, for example, the Spanish renamed pueblo communities of San Gabriel and San Juan. Proximity allowed for mutual protection against raids, trade, Catholic missionization, and Spanish forced labor of Native people. The western pueblos in Arizona, largely the Hopi and the Zuni, had limited contact with colonists, having only regular contact with Franciscan priests living in the mission in Awat'ovi.[377] Spanish population estimates for the Hopi, in the period leading up to the revolt, was around 14,000.[378] As the Hopi successfully repelled Spanish missionaries and colonists, especially due to their isolation from Spanish settlements in New Mexico, the record of

[377] Hopi villages are not located near rivers, they depend on rainfall and springs for water. The mission and the village of Awatovi were destroyed during the Pueblo Revolt by the Hopi for reasons specific to Hopi lifeways.

[378] Stodder and Martin, 66. Antonio de Espejo's estimate from his visit to Hopi in 1582-1583 was 12,000 Hopi living in five villages (Peter M. Whiteley, *Deliberate Acts: Changing Hopi Culture Through the Oraibi Split* (Tucson: University of Arizona Press, 1988), 15).

epidemics is incomplete.[379] In 1776 Friar Silvestre Velez de Escalante, after a visit to Hopi, recorded a population of 7,494 Hopis living in seven villages.[380] In 1780 explorer and governor of New Mexico, Juan Bautista de Anza counted 798.[381] This dramatic loss of population resulted from a severe smallpox outbreak in 1780 and from starvation after four years of repeated crop failure due to insufficient rain, encounters with Navajo raiders, and other pestilence.[382] The smallpox outbreak in 1780 was part of a larger hemispheric smallpox epidemic, which lasted from 1775 until 1782.[383]

In 1853, the Hopis experienced a severe outbreak of smallpox. In that same year, while on a scouting expedition in search of a continental rail line, Lieutenant Amiel Whipple wrote, "We had sent to Moqui [Hopi], hoping to obtain Indian guides through this country also, but the messengers returned unsuccessful. They brought tidings that, by hundreds, the Moquis were dying by small-pox. Only three men could be found in health, and they were insufficient to throw the dead over the walls."[384] Whipple estimated the population of the seven Hopi villages to be around 6,720; a year earlier, Dr.

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[379] Fenn, 163.

[380] Ibid.

[381] Ibid.

[382] Fenn, 162-163. The 1890 census reports records the year of the outbreak in 1775, coinciding with a time of famine as well as the pandemic Fenn argues for in her work (United States, Department of the Interior. *Report on Indians Taxed and Indians Not Taxed in the United States (except Alaska) at the Eleventh Census: 1890* (Washington D. C.: Government Printing Office, 1894), 171)

[383] As demonstrated by historian Elizabeth Fenn in *Pox Americana: The Great Smallpox Epidemic of 1775-82* (New York: Hill and Wang, 2001)

[384] Amiel Weeks Whipple, *Report of Explorations for a Railway Route, Near the Thirty-Fifth Parallel of Latitude: From the Mississippi River to the Pacific Ocean* (Washington, D.C.: Government Printing Office, 1854), 23. Lieutenant Whipple's journey took him from Fort Smith, Arkansas to Los Angeles, California. The purpose of this expedition was to determine the feasibility of a transcontinental rail line along this route. This report is remarkable for its wealth of ethnographic descriptions of the Native peoples encountered as well as sections on geology and botany.

P. S. G. Ten Broeck, assistant surgeon in the United States Army, estimated a population of 8,000.[385] The 1890 census estimated the Hopi population to be around 2,000, suggesting other visitations of disease and famine that further reduced the Hopi population.[386] Forty-five years later in 1898, the Hopis, along with the Zuni and the Pueblos of New Mexico, experienced another outbreak. During this epidemic, 412 Hopis received medical care, but 220 chose not to.[387] Of those who received treatment, only forty-two died, a death rate of death rate of about six percent.[388] If a group, already exposed to smallpox, has a death rate of seventy-four percent, the death rate in an unexposed population, where all members are susceptible to the disease, is likely to be as high, or higher, than seventy-five percent.[389]

The impact of European colonization in the Americas is multidimensional, making it essential to understand the link between biological and cultural processes.[390] The importation of unfamiliar disease into societies not culturally or physically prepared, undermined social structures, bringing Indigenous societies many to collapse. By itself the undermining of a people's social structures compromised individuals' and societies' ability to adapt. With colonization, a society already in flux remained under further

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[385] United States 1890, 179.

[386] Ibid. Frederick J. Dockstader refers to a severe smallpox outbreak in 1866, a consequence of a severe drought, which lasted from 1866 to 1868, and the resulting famine (Frederick J. Dockstader, "Hopi History, 1850-1940," In *Handbook of North America Indians*, volume 9: *The Southwest*, edited by Alfonso Ortiz (Washington D.C.: Smithsonian Institution, 1979), 525). Currently, I am searching for the source of his information related to the 1866 outbreak (the 1890 census does not mention this outbreak).

[387] E. Wagner Stearn and Allen E. Stearn, *The Effect of Smallpox on the Destiny of the Amerindian* (Boston: Bruce Humphries Publishers, 1945), 15.

[388] Ibid.

[389] Ibid. and Dobyns, 13-14.

[390] Stodder and Martin, 55.

stress. The consequences of colonization tainted and obscured the social and cultural changes resulting from the importation of disease.

Due to the lack of written records, tracing the Hopi experience with smallpox, or any imported disease, is like chasing a ghost. While the estimates of the sixteenth and seventeenth centuries places the population of Hopi well over ten thousand, in the early years of the twentieth century population estimates place it closer to two thousand. The records available prior to the nineteenth century, whether recording eyewitness accounts or rumor, hint at disease epidemics, severe famines, and the impact of raids. Scientific findings provide missing details, such as environmental instabilities causing extended droughts. Archeology confirms the expansion of settlements during stable wet periods and contractions during drier periods. Famine and disease are bedfellows and with the interactions between pueblos, whether for trade, ceremonies, or protection, allowed for the spread of epidemics between the eastern (New Mexico) and western (Arizona) pueblos. While it is not possible to trace the history of smallpox in the Southwest with any level of certainty, the recorded outbreaks in the nineteenth century provides a means through which to understand the impact of smallpox on the Hopi from its first importation to Hopiland until the last reported case in Arizona in 1946.[391]

[391] Arizona State Department of Health, *Annual Report Fiscal Year 1946/1947*, 65, and Arizona State Department of Health, *Annual Report Fiscal Year 1047/1948*, 95-96

CHAPTER 5

THE HOPI

It was spring when the disease disappeared. We were lucky. The old people said that the vaccinations were all nonsense but probably harmless, and that by our prayers we had persuaded the spirits to banish the disease – that it was Masau'u, who guards the village [of Oraibi] with his firebrand, who had protected us.

–Don C. Talayesva of Oraibi, *Sun Chief*[392]

The smallpox outbreak of 1898-1899 did not migrate across the continent or globe, it remained a regional epidemic. The visitation of smallpox in Hopiland, taken by itself, seemingly had little impact, but considered in context, the outbreak played a role in the events leading up to the division of the village of Oraibi in 1906. Placing the 1898-1899 outbreak into context reveals that the outbreak disrupted the fragile truce and accelerated tensions that divided the Hopi living in Oraibi. By approaching the split from the third dimension of the Medicine Way, it is also possible to argue against the idea of traditionalist versus progressive, as both sides used the Hopi life plan in determining what to adopt and what to reject. My working definition of essential Hopi culture is living in balance and harmony as informed by the past, and expressed and reinforced in ceremonies and life ways in fulfillment of the Hopi life plan, as given by *Maasaw* at the emergence into this world.

The traditional Hopiland, according to their migration stories, extends over much of northern Arizona and New Mexico and parts of Utah and Colorado. The Hopi

[392] Don C. Talayesva and Leo W. Simmons, *Sun Chief; The Autobiography of a Hopi Indian* (New Haven: Published for the Institute of Human Relations by Yale University Press, 1942), 91.

Reservation, created by Executive Order in 1882 and redefined by the Navajo and Hopi Land Settlement Act of 1974 (Public Law 93-531) and the Navajo-Hopi Land Settlement Act of 1996 (Public Law 104-301), is located in northeastern Arizona an island in the sea of the Navajo Nation. At the end of their migrations, the Hopi settled in several villages on the slopes of three fingerlike extensions on the southern portion of Black Mesa. In 1150, the Hopi built Oraibi, the first village built on the mesa top. Due to concerns of Spanish retaliation in the wake of the Pueblo Revolt of 1680, the Hopi moved their villages to the mesa tops, making the villages more defendable, though precarious due to scarcity of water and other resources on the mesa tops. With the exception of the villages of Upper and Lower Moenkopi, located near Tuba City, all Hopi villages are still located on or at the slope of the three mesas. On the easternmost mesa, First Mesa, are the villages of Walpi, Shitchumovi, Polacca, and the Tewa village of Hano. The villages on Second Mesa are Mishongnovi, Sipaulovi, and Shungopavi. On Third Mesa are the villages of Oraibi, Hotevilla, Bacavi, and Kykotsmovi (formerly New Oraibi).

The Hopis emerged into this world after journeying through three previous worlds, each previous one meeting with destruction due to disharmony.[393] To borrow from historian Lomayumtewa Ishii's retelling:

> …Hopis found their way into each successive world by the aid of prayer, insight, and with the help of animals. Eventually, Hopis found their way into the fourth world, or the world as we currently know it…Once everyone reached this world, we had to ask permission to live here. We did not own any of this land. *Massauw*, or the ruler/owner of this world gave Hopis permission to live here.[394]

[393] Hopi is a shorten version of Hopituh Shi-nu-mu, their name for their people.

[394] Massauw is also called the God of Fire and of the Dead, Ruler of the Fourth World, and Protector of the Hopi.

As *Massauw* remains the ruler/owner of this world, the Hopi are caretakers until his return. Additional stories describe the creation of the sun and moon and the improvement of the earth for the survival of people and animals. All humans descended from those who arrived into this world, and not simply the Hopi. Upon arrival, instead of venturing out into the new world, people remained around the *sipapuni*. Some clans explain that the test that followed prompted people to begin their migrations. Ishii continues:

> However, there was a test for those who came into the world. Different groups of people had to select an ear of corn…Hopis, known for taking time to decide, waited until the last and selected the shortest ear of corn. *Massauw* said that those who selected the short ear were wise. These corn represent a life plan for those who selected the ears. Those who were eager to select the largest, most beautiful ear, would enjoy a good life but it would be superficial and short. For those that selected the shortest ear, their lives would be hard and difficult, but the people would live a very long, happy and humble life. Hopis selected the short ear.[395]

Often in retellings, the Navajo select the ear of corn with the largest kernels, suggesting the animosity between the Hopi and Navajo began a very long time ago. Some clans include the color of the corn, for example, the Hopi selected the blue ear of corn. Ishii continues:

> *Massauw* gave [the Hopis] instructions on many different aspects about life. His instructions were contained in the forms of ceremonies, teachings, and prayers. But he made it clear that Hopis should never forget their past, where they came from, and his instructions. He made [them] caretakers of this world, and [they] must never stray from [their] duties to perpetuate his instructions. Otherwise, [their] lives would be in jeopardy and would end.[396]

The life plan given to the Hopi by *Massauw* forms the foundation of Hopi life, traditions, ceremonies, and epistemology. After receiving their instructions from *Massauw*, people prepare to begin the next part of Hopi origin stories – migration.

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[395] Lomayumtewa C. Ishii, "Voices from Our Ancestors: Hopi Resistance to Scientific Historicide" (PhD diss., Northern Arizona University, 2001), 150-151.

[396] Ibid.

Before people went their separate ways to begin their migrations, a death occurred.[397] The death of the village chief's son indicated that a *powaqa*, or witch, an evil-hearted person, or two-hearted, had managed to escape into this world.[398] Before the *powaqa* could be toss back into the *sipapuni*, she told them to look into the *sipapuni* and they saw the son alive.[399] The Third World had undergone transformation from a place out of balance to a paradise. The *powaqa*'s presence had already contaminated this world, but as she held the potential for good and contained useful knowledge, the people did not put her to death.[400] Soon after, people went their separate ways. The *bahana* elected to have the *powaqa* come with them, as they did not fear her and felt her knowledge would be useful to them.[401] We can trace the disharmony present in this world back to her.

While the retelling of Hopi history generally begins the same, as no single clan has the complete authoritative version, it splits into many voices as the clans begin their migration and journey to Hopiland.[402] Within the stories of Hopi clan migration are the themes "of destruction and renewal, of maintaining balance, of recognizing

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[397] Harold Courlander, *The Fourth World of the Hopis* (New York: Crown Publishers, 1971), 28.

[398] Ibid., 28. The *sipapuni* is a geographical location, not simply cosmological. *Powaqa* also refers to one who is highly educated and knowledgeable and can use this knowledge for good or bad. In Edmund Nequatewa retelling, the person who died was a little girl and they observed her playing with the other children when they looked into the sipapuni.

[399] Armin W. Geertz, "A Reed Pierced in the Sky: Hopi Indian Cosmography on Third Mesa, Arizona," *Numen* 31, no. 2 (December 1984): 221.

[400] Courlander, 29.

[401] Ibid., 30. Bahana is translated as elder white brother.

[402] There are currently 34 clans.

consequences, and the cyclic nature of history."[403] In these stories, destruction is a result of living out of balance with one another and the environment, forgetting or forsaking the Hopi life plan, witchcraft, or failure to keep a good heart.

The journey from the first world to the present one, as well as the migration stories, demonstrates that, for the Hopi, historical events are cyclical and therefore past events are prophetic and relevant to present events.[404] Events that occur in the present occurred in the past and/or in the previous worlds. For those knowledgeable and observant, the awareness of time's cyclical nature allows them to make prophecies of what is to come. Therefore, Hopis' awareness of their history not only informs them of their identity, but also teaches them how to live in the present and prepare for the future. "To explain anything Hopi," writes Ishii "is to use the past to explain the present. All of our knowledge comes from the past and represents a genealogy of knowledge that extends to our origins as Hopis."[405]

Hopis use of the past in the present does not mean their culture is static, instead it means the changes they do make and the outside influences they accept are because said changes fit within their way of life.[406] With their migrations and absorptions of different clans, the Hopi are a multi-cultural society – Hopi villages having absorbed clans that

[403] Ishii, 175-176. Perhaps more accurately village or ceremony migration (Wesley Bernardini, "Identity as History: Hopi Clans and the Curation of Oral Tradition," *Journal of Anthropological Research* 64, no. 4 (Winter, 2008): 484).

[404] Ishii, 6.

[405] Ibid., 4.

[406] Ibid., 157.

could benefit the village and rejected others for the benefit of the village, too.[407] The past warns that in absorbing a group or ideas that one should not forget the life plan and duties given to them as Hopi – to forgo the Hopi way is to head towards punishment and destruction.[408]

Corn is at the heart of the Hopi life plan, metaphorically, ceremonially, and literally. Anthropologist, lexicographer, artist, and Hopi leader Emory Sekaquaptewa and archaeologist Dorothy Washburn simply stated, "For the Hopi, growing corn is their religion."[409] They further argued, "The core of Hopi cosmology centers on practices that bring the rains that nurture the corn and the Hopi people…In Hopi belief the practice of faith affects the practice of farming."[410] Similarly Dennis Wall and Virgil Masayesva, staff members of the Institute for Tribal Environmental Professionals wrote, "For the people of the mesas corn is sustenance, ceremonial object, prayer offering, symbol, and sentient being unto itself. Corn is the Mother in the truest… Hopi also regard corn is also regarded as the child…The connection between the people and the corn is pervasive and deeply sacred. In a remarkable symbiosis between the physical and spiritual, the Hopi

[407] Ibid., 157. There are currently 34 living clans (Hopi Cultural Preservation Office, "Hopi Villages and Clans" Hopi Cultural Preservation Office, last modified September 2009 accessed September 10, 2014, http://www8.nau.edu/hcpo-p/villages.html). A person is born into their mother's clan. Ceremonies are clan specific and land, specifically farmland, is divided between clans. Some clans die out over time or others merge with another clan, thus the number of living clans varies. For example, Voth, in *Hopi Proper Names*, lists 30 clan names (Henry R. Voth, *Hopi proper names*, vol. 6, no. 3. Field Columbian Museum, 1905).

[408] Ishii, 157-158.

[409] Emory Sekaquaptewa and Dorothy Washburn, "They Go along Singing: Reconstructing the Hopi past from Ritual Metaphors in Song and Image," *American Antiquity* 69, no. 3 (July 2004): 470.

[410] Ibid., 459.

people sustain the corn and the corn sustains Hopi culture."[411] Hopi treat corn as a child, in how it is grown, harvested, stored, and used. While, traditionally, men worked the fields, it is the women's job to sort, store, dry, and grind the corn. Women set aside the corn men are to sow the following planting, thus contributing to the longevity and survival of the best varieties of corn.[412] In the sorting process, women also set aside perfect ears for ceremonial and ritual use.[413] The grinding of the corn, using grinding stones, done in a communal setting, is an important social activity, as well as a training opportunity for girls. Wall and Masayesva wrote, "Most important in terms of Hopi culture, it is a time when young girls learn to take their traditional place in the family, to accept their gender-based role as provider and nurturer in the home, and to learn the value and necessity of hard work."[414] For boys, such training occurs as they work in the fields with their male kin.

While the introduction of machines makes farming easier, western assumptions about the Hopis' connection to their crops and associated practices ignores that the spiritual component of their farming techniques. Thus at the end of the nineteenth century, the Hopi met the introduction of agricultural machines by whites with bitterness. The bitterness that arose resulted from the clear understanding that Americans, whether Indian agent, missionary, or teacher, like the Spanish before them, disrespected and

[411] Wall and Masayesva, 436-437. Masayesva was a former director of the ITEP before his death in 2005, a member of the Hopi tribe he was raised in Hotevilla. Wall is author, writer-photographer, and ITEP's editor.

[412] Ibid., 443.

[413] Ibid., 448.

[414] Ibid., 448-450.

arrogantly discarded Hopi beliefs and values and sought to change their culture in ways that unbalanced Hopi life.

What are the consequences of being out of balance? According to Ishii, "It is a basic concept that we must have good thoughts and happiness when conducting Hopi activities. If not, then a consequence may occur to that particular person or someone close – a child, spouse, or close family member. But on a larger scale, catastrophic events such as drought, earthquakes, fire, and death occur."[415] A proper state of mind and heart are required for ceremonies to be successful and successful ceremonies allow for the continual survival of the Hopi people. Failed ceremonies lead to crop failures, droughts, famine, and disease. Hopi history demonstrates that a community in balance with one another is in balance with the environment, but if they falter in their duties or allow their hearts to become corrupted, the environment will suffer. "Illness, drought, famine," explained Ishii, "and even death of a close loved one are the punishments that we must face if we choose to disregard our Hopi way of life. This is how Hopis understand the history of ruins in the American Southwest. People at one point became lazy and, eventually, lost their way of life. The punishment meted out was drought and illness. Finally, the environment could not sustain the people, so they either moved or died out."[416]

In her autobiography, *No Turning Back: A Hopi Indian Woman's Struggle to Live in Two Worlds,* Polingaysi Qoyawayma recalled her mother asking, "How can we weave

[415] Ishii, 160.

[416] Ibid., 155-156.

beauty into our ceremonial kilts and sashes if we are hugging hatred to our hearts?"[417] Just as one cannot weave beauty with a tainted heart, one cannot walk in beauty or live the Hopi life plan if one has a bad heart. Therefore, what is a good heart? Anthropologist Dorothy Eggan explained, "A good heart is a positive thing…It means a heart at peace with itself and one's fellows. There is not worry, unhappiness, envy, malice, not any other disturbing emotions in a good heart…the Hopi concept of a good heart [includes] conformity to all rules of Hopi good conduct, both internal and external."[418] Qoyawayma recalled how

> Mothers told their children, 'We must not allow the bad behavior of the *Bahana* to cause us to act in the same manner. We must try not to think bad thoughts, because bad thoughts are like jabbing at the thought-of-one with a knife. He can't see what you are doing to him, but you know, and killing someone in your thoughts will let evil spirits into you. We must be peaceful and unresisting. Otherwise, how can we be pure-hearted enough to offer our prayers to Cloud People and the Rain Gods? And if we do not offer prayers and Rain Gods forget us, then surely we shall starve.'[419]

A bad heart affects not only the individual but can harm the community, which includes humans and the rest of nature.

All aspects of Hopi life teach and reinforce for a child their community and kinship obligations and interdependence.[420] Eggan argues in her study, "Strong emotional conditioning during the learning process was an instrument in cultural continuity among the Hopi…this conditioning was *constantly* as well as *consistently*

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[417] Polingaysi Qoyawayma and Vada F. Carlson, *No Turning Back: A True Account of a Hopi Indian Girl's Struggle to Bridge the Gap between the World of Her People and the World of the White Man* (Albuquerque: University of New Mexico Press, 1964), 30.

[418] Dorothy Eggan, "Instruction and Affect in Hopi Cultural Continuity," *Southwestern Journal of Anthropology* 12, no. 4 (Winter, 1956): 360-361.

[419] Qoyawayma, 30.

[420] Eggan, 366.

instilled during the entire lifetime of an individual by a circular pattern of integration…To change him, influences had to breach the concentric walls of social process."[421] Qoyawayma described more simply, "Rich in life, color, and emotion, the Hopi way had been a strong but invisible web, holding the people together."[422] Songs reiterate lessons and reveal changing perspectives over generations, as each generation seeks to express themselves, demonstrating cultural continuity and change, and giving reminders on how to life the Hopi life way.[423] The interconnected and reciprocal relationships the Hopi have with each other, the spiritual world, and the natural world require balance and a good heart, and through daily ritual and social practice, a person maintains the core of balance – a good heart.[424]

A person who thinks about death will potentially develop a bad heart for they can become anxious or troubled, or become so consumed with thoughts about death and the afterlife that they neglect the requirements of living.[425] There are few oral traditions, at least those available to the uninitiated and non-Hopi, concerning life after death. "Journey to the Skeleton House," recorded and translated by ethnographer and Mennonite missionary Henry Voth, tells the story of a young man, Shyngopavi's Village Chief's son, who "[wondered] what became of the dead, whether it is true they continued to live

[421] Ibid..

[422] Qoyawayma, 27.

[423] Sekaquaptewa and Washburn, 462.

[424] Ibid., 467.

[425] E. A. Kennard, "Hopi Reactions to Death," *American Anthropologist* 39, no. 3 Part 1 (July-September 1937): 492.

elsewhere."[426] As the father did not know the answer, he consulted with others and was eventually directed to speak with the Badger Old Man who had the knowledge and medicine necessary for the boy to find his answer. Following the Badger Old Man's instructions, and "after the young man had fallen asleep, he saw a path leading westward."[427] Following the path, the boy has a series of encounters and those he encounter direct him to continue on the path westward. Prior to reaching the Skeleton House, he encounters Skeleton Woman (*Mas Wuhti*), she directs him to continue on the road, avoiding the column of smoke, and the road will lead him to the Skeleton house.

The boy's destination is a large village, when he tells the residents he is Bear Clan, they send him to speak with his ancestors. During his time with them, he quickly learns the difference between the living and the dead, for example, the dead do not eat the food, only the odor, "that is the reason why the clouds into which the dead are transformed are not heavy and can float in the air."[428] After learning about the differences between worlds, he is sent back home. His ancestors tell the boy, "Go back and tell them in the village that we are living here. For some it is not yet at all time to come, but if their hearts are not good and they are angry they will come here sooner, so tell them no one should wish to travel this way…Now you must not think about that any more. You must go now and live there strong."[429] The boy returns home to recount his tale. In essence from this tale and others, death is a transition to a perfect, or at least

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[426] Henry R. Voth, ed., *The Traditions of the Hopi* (vol. 8, Field Columbian Museum, 1905), 114.

[427] Ibid., 115.

[428] Ibid., 116.

[429] Ibid., 119.

altered, state and not something a person should fear.[430] It is four days after burial, the *hikwsi*, "that part of man which they believe to be immortal," according to Voth, leaves the decease and journeys into the *sipapuni* to *Maski*.[431]

Archeological evidence suggests that Hopi villages contacted between 1450 and 1540, possible due to imported diseases and/or environmental instability. The Hopi practice dry farming, meaning they do not irrigate their crops, but instead depend on precipitation and runoff water, as well as hard work and prayer, thus making their harvests more sensitive to environmental instabilities and variance.[432] A drought meant famine and population loss. Imported diseases may not have arrived until the seventeenth century, or later, when the Hopi maintained greater contact with the Spanish due to the missions built at Awat'ovi, Oraibi and Shungopavi.[433]

Testifying in the Hopi Hearings, conducted by the Bureau of Indian Affairs on 1955 July 15-30 concerning the issues facing the Hopi people and villages, beginning his testimony with an account of Hopi history, Andrew Heriequaftewa of Shungopavi recalled:

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[430] Mary E. Black, in "Maidens and Mothers: An Analysis of Hopi Corn Metaphors," wrote, "The *hikwsi* (roughly, the breath, soul, or spirit) of both humans and corn plants is said to *aniwti* (become perfected, or continue to become perfected) after death, when it is released from the burden of the body and continues on…Thus humans and corn are said to share common characteristics and critical stages in their life cycles: at birth, in taking sustenance from the world, in reaching maturity, at death, and beyond, when the spirit achieves perfection" (Mary E. Black, "Maidens and mothers: an analysis of Hopi corn metaphors," *Ethnology* 23, no. 4 (1984): 282).

[431] H. R. Voth, "Notes on Modern Burial Customs of the Hopi of Arizona," *Publications of the Field Museum of Natural History*. *Anthropological Series* 11, no. 2, Brief Miscellaneous Hopi Papers. The Stanley McCormick Hopi Expedition (February, 1912): 99 and Geertz, "Reed," 228.

[432] Wall and Masayesva, 435.

[433] Daniel T. Reff, "The Demographic and Cultural Consequences of Old World Disease in the Greater Southwest, 1520-1660" (PhD diss., University of Oklahoma, 1985), 195.

> It was during the time when the first Spanish came upon our villages [in 1540] and which has almost disrupted all of our life and religious pattern, and saying that his ways was the only way and the good way to live, and he used every means to influence the people to go along with them, and it almost destroyed everything that the Hopi stands for.[434]

Franciscan friars Francisco Pooras and Andreas Gutierrez, and lay brother Cristobal de la Concepcion, first arrived in Awat'ovi on August 20, 1629, and though initially met with hostility, after a miracle won the approval of the Hopi living in Awat'ovi, and the fathers began building San Bernardo mission.[435] The Franciscans intentionally built the San Bernardo mission on top of an important kiva, so to symbolize the imposition of Christianity upon Hopi beliefs.[436] Sometime after 1634 the friars, using the Hopi as laborers, built a mission in Oraibi (San Francisco mission) and another in Shungopavi (San Bartolome mission).[437] Instead of seeking to understand the Hopi, the Spanish, like other European colonizers, assumed themselves culturally, politically, and religiously superior to the Hopi, and the Franciscans strove to displace and replace Massauw's life plan with a Christian life plan. Testifying in the Hopi Hearings, July 15-30, 1955, beginning his testimony with an account of Hopi history, Andrew Heriequaftewa of Shungopavi recalled:

> I believe they were among us about 27 years, and at the end of 27 years the life of the Hopi was at a stand still. We experienced severe drought with no rains for long periods of time after that. The grass was drying up and everything was so dry on the earth that we can hardly raise any food. We had a very had time. We began to look at our life that we have made. By going along with him which caused this drought, but out of the many people and leaders there were a few who

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[434] United States, *Hopi Hearings, July 15-30, 1955* (Keams Canyon: The Bureau, 1955), 95.

[435] Harry C. James, *Pages from Hopi History* (Tucson: University of Arizona Press, 1974), 44-45.

[436] Ibid., 47

[437] Ibid., 45. The exact dates are uncertain.

> remained fast and began to get hold of themselves, and looking back over their instructions they began to look back and decided that it is best to go back on their own way of life and religion, so we finally came to a point where we had to clean them out in order that their way of life did not destroy us [Pueblo Revolt of 1680]. And from there on we began to go our own ways in order so that we began to develop the things we had in the past and practice them so we had a good life.[438]

From a non-Hopi perspective, a larger weather cycle caused the weather disturbances during this period, but from a Hopi perspective, drought was a consequence of them forgetting their life plan. Spanish missionaries' abuse of Hopi, their disrespecting of sacred sites and ceremonial items, and their taking advantage of the situation only added to Hopis' growing dislike and animosity towards Spanish intrusion. During the Pueblo Revolt of 1680, the Hopi killed the four Franciscan friars and destroyed the missions in Awat'ovi, Oraibi and Shungopavi.[439] Through this destruction, the ousting of the Spanish, the Hopi could return to their life way and the benefits derived from it. When the Spanish returned in 1692, the Hopi passively resisted Spanish intrusion while maintaining peaceful relationships with the Spanish colonists.[440] Further aided by their isolated location, the Hopi maintained their life ways, adopting western imports as it suited their own purposes. Over the centuries, until the Americans arrived, the Hopi culture changed and adapted without colonial oversight, each generation perpetuating cultural practices while also reinterpreting them.[441]

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[438] United States, *Hopi Hearings, July 15-30, 1955* (Keams Canyon: The Bureau, 1955), 95.

[439] James, 54

[440] E. Charles Adams and M. Nieves Zedeño, "BAE Scholars as Documenters of Diversity and Change at Hopi, 1870-1895," *Journal of the Southwest* 41, no. 3 (Autumn, 1999): 312.

[441] A living culture is a changing culture.

Due to the trade link between eastern and western Pueblos, there is strong potential for migration of disease without the presence of the Spanish.[442] In times of drought, or to escape outbreaks of disease, the Hopi moved to Zuni Pueblos, and others, until they could safely return to the mesas.[443] In the smallpox outbreak of 1898-1899, Hopi brought smallpox into Hopiland.

In 1540, when Francisco Vasquez de Coronado sent Pedro de Tovar and Friar Juan de Padilla, the estimated Hopi population numbered between five and six thousand.[444] By the 1870s, the population of the Hopi villages was about 1,950.[445] By 1890, Oraibi, located on Third Mesa, had nearly a thousand residents, making it the largest of the Hopi villages. As the Hopi villages are traditionally a loose federation instead of a unified people, why is the village of Oraibi important? If each village has ceremonies and a purpose unique to it, why would the people of Oraibi care about the happenings on the other mesas and in other villages? The answer is multifaceted but simple –kinship, a linked history, and ceremonial cycle connect the many villages and their residents. Traditionally, village chiefs are from the Bear Clan, the first to return, or arrive, to Hopiland. Maasaw instructed the Bear Clan to be caretakers of the land between the Colorado and Rio Grande rivers. The Bear Clan founded Oraibi.[446] Oraibi has deep cultural significance. Up until it split, Oraibi was the largest of the villages and

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[442] James, 436.

[443] Ibid., 435.

[444] Richard O. Clemmer, *Roads in the Sky: The Hopi Indians in a Century of Change* (Boulder: Westview Press, 1995), 4.

[445] Spicer, 201-202; Clemmer cites fewer than 2,400 in 1870 (Clemmer, 4).

[446] Wall and Masayesva, 439-440.

held almost the complete ceremonial cycle of dances.[447] Beyond its cultural significance and kinship ties, the U.S. government's policies that agents implement on one mesa, they also carried out on all mesas. While the outbreak of 1899 did not reach Oraibi, it still influenced the Hopi living there.

In 1906 the Hopi village of Oraibi split, with one faction leaving the village and settling in a new village, Hotevilla, and the other remaining in Oraibi.[448] The tensions that caused this division began in the early 1890s with the establishment of government schools for the Hopi, the first in Keams Canyon, followed in 1893 with an additional school at Oraibi and, in 1894, another at Polacca, near First Mesa.[449] Not all Hopi opposed to the government schools, due to the potential benefits schooling could bring to the continuance and survival of the tribe. Residents of First Mesa, closest to Keams Canyon and the agency, were generally more open to schools. The largest number of accommodationalists lived on First Mesa. Arguably, due to their extended contact with agents and the first school, those of First Mesa had more time to decide how and what they would adopt of the practices and resources introduced by agents and missionaries. Proximity and ease of access of villages on First Mesa compared to Second and Third Mesa, allowed for better communication and for the agents to keep their promises to the leaders of First Mesa. On the other hand, some elders felt that government schooling would cause the children to abandon the Hopi way.[450] Considering the purpose of the

[447] Some ceremonies were and are village specific.

[448] A group eventually split off from Hotevilla and formed the village of Bacavi.

[449] Robert A. Trennert, "White Man's Medicine vs. Hopi Tradition: The Smallpox Epidemic of 1899," *The Journal of Arizona History* (1992): 350.

[450] Ibid.

schools was the assimilation of the Hopi people into American culture, the leaders' concerns were well founded. Indeed some students did turn away and abandon tradition.[451] Matters did not improve when agents sent soldiers in to round children up to forcibly take them to school – causing many parents to hide their children.

Only a child during the course of events, Qoyawayma remembered the growing tension between groups. She recalled:

> The white authorities had persuaded Lololoma, chief of the Bear Clan, to sanction their plans for his people. He had, as his people said, "taken the pencil." By making his mark with it, he committed the children of Oraibi to attendance at the new Government school…The conservatives flatly refused to follow his lead. In the old days there would have been open war, a clash that would have resolved the issue, but times had changed…only stubborn resistance ensued, with anger smoldering in the hearts of both factions – anger which would eventually lead to a wound from which Oraibi would never recover.[452]

Qoyawayma's father, Fred Qoyawayma, who had a "pleasant association" with Voth, was a member of the traditionalists. While raised by traditionalist parents, Qoyawayma chose to attend the Oraibi school and then Sherman Institute in Riverside, California, setting her on a journey similar to other Native Americans of living in two worlds and trying to reconcile them. One example of the open war she refers to is Awat'ovi, a Hopi village destroyed in 1700 by the Hopi because the villagers had forsaken their life plan, in 1700.[453] A repeating pattern in Hopi history, Qoyawayma explained, "Even then [the Pueblo Revolt], it was declared, there had been two factions in Oraibi, one friendly to outsiders, the other hostile. The quarrel of Yeokeoma and Lololoma was in a sense only

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[451] Ibid.

[452] Qoyawayma, 20-21.

[453] Scott Rushforth and Steadman Upham, *A Hopi Social History: Anthropological Perspectives on Sociocultural Persistence and Change* (Austin: University of Texas Press, 1992), 104.

a continuation of the village strife."[454] As the villagers no longer had the option of open warfare, tension simmered.

"Our ancestors had predicted the coming of these Whites and said that they would cause us much trouble," Don C. Talayesva recalls in his autobiography, *Sun Chief: the Autobiography of a Hopi Indian*:

> Most people in Oraibi argued that we should have nothing to do with them, accept none of their gifts…Those who would have nothing to do with Whites were called "Hostiles" and those who would cooperate a little were called "Friendlies." These two groups were quarreling over the subject from my earliest memories and sometimes their arguments spoiled the ceremonies and offended the Six-Point-Cloud-People, our ancestral spirits, who held back the rain and sent droughts and disease.[455]

Oraibi's Village Chief, or *kikmongwi*, Loloma was open to adopting changes, such as schools, while Lomahongyoma and his followers deeply opposed to all forms of U.S. intrusion and influences. In 1904 Tewaquaptewa became Oraibi's Village Chief after the death of Loloma.

In late 1894 a fragile truce developed after nineteen traditionalists – those who opposed schools and other forms of U.S. intrusions. The federal government sent these traditionalists to the prison on Alcatraz for ten months after an altercation with accommodationalists. Accommodationalists were those willing to accept sending their children to school and adopt, or at least consider, some changes that were introduced to them by the U.S. government.[456] In federal records, these two groups are labeled

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[454] Qoyawayma, 38-39.

[455] Talayesva and Simmons, 88.

[456] Other forms of U.S. intrusion: allotment of land, building of houses below the mesas, introduction of American clothing, and introduction of agricultural machinery (Frank H. Cushing, Jesse W. Fewkes, and Elsie W. Clews Parsons, "Contributions to Hopi History," *American Anthropologist* 24, no. 3 (July-September 1922): 282-284).

"friendlies" and "hostiles," labels that expressed a colonial bias and prejudice more than the true difference between groups.[457] One must use the label "traditionalist" carefully because it suggests that the other group is somehow more progressive. While some willingly adopted new ways, all involved reacted to outside influence from a Hopi worldview, meaning all the Hopi involved attempted to maintain traditional Hopi values and norms. The degree of willingness to adopt foreign ways differentiated the groups. After the U.S. government's show of force and the disruption it caused, Hopi leaders reluctantly accepted sending children to the day school, though some resistance remained.[458] By 1898, having reached projected enrollment, the U.S. government felt they were making progress. The peace between all parties involved, the Indian agents, the traditionalists, and accommodationalists, was delicate and any overstep by the U.S. government held the potential of stirring up old tensions and mistrust. In December 1898, smallpox disrupted this fragile truce, increasing the tensions between traditionalists and accommodationalists that eventually led to the split of Oraibi.

Around 1897 smallpox began to appear in communities along the Rio Grande, where migrant workers from Mexico, where smallpox was endemic, may have imported it, and by late 1898, it had spread into Albuquerque.[459] Railroad workers susceptible to the disease, then spread it along the railroad route, at which point exposure became inevitable for the Native communities closest to rail lines, and the Atchison, Topeka, and

[457] Clemmer, 85.

[458] Trennert, 352.

[459] R. H. Frost, "The Pueblo Indian Smallpox Epidemic in New Mexico, 1898-1899," *Bulletin of the History of Medicine* 64, no. 3 (1990): 423.

Santa Fe railroads had tracks close to several Native communities.[460] In January 1898, Isleta Pueblo, located fifteen miles south of Albuquerque, became the first community to report smallpox cases.[461] Over the course of the next year, it spread to other Pueblos in New Mexico, with the exception of the Pueblos north of Albuquerque, and, by December 1898, to the Hopi mesas in Arizona.[462]

In reading reports and letters written in the midst of the epidemic in New Mexico and afterwards, people placed the blame for the scale of the epidemic on the Pueblo agency and its failure to act in a timely manner. The failure of Agent Nimrod S. Walpole, Indian agent for the Pueblos of New Mexico, to take immediate action by ordering vaccines, setting up quarantines, and providing medical supplies compromised the Pueblo Agency's efforts to limit the scale of the epidemic. R. H. Frost provides a detailed retelling of events and analysis of the overall epidemic in New Mexico's pueblos. In his analysis it is clear that Pueblos that attempted to enforce quarantines, such as Laguna, and accepted western treatments weathered the epidemic with low death tolls. Pueblos with high death tolls, such as Zuni, failed to have a quarantine and their locations either too isolated to receive quick western medical treatments or they refused aid until much later.[463]

It is important to note that survival rate for smallpox is not dependent on genetics or culture, but on the quality of nursing care. Historically Native communities had a

[460] Ibid., 424.

[461] Ibid,

[462] Ibid., 428.

[463] Laguna's 7 percent to Zuni's 13.9 percent (Ibid., 429).

larger susceptible population, causing there to be fewer healthy people to take care of the sick. Without proper care, patients are more likely to die of secondary infection or complications (smallpox takes about thirty days to run its full course, leaving a victim helpless for most of the period). Proper nursing care is vital to recovery. Because it is a virus, there is no cure for smallpox, but it is possible to prevent a full infection by vaccinating an individual soon after exposure to smallpox. The best method of prevention is vaccination.

At the end of the nineteenth century, there existed three methods of vaccinations available – the arm-to-arm (a person took infected material from one patient, used to infect another, and the process is repeated), vaccine crusts (dried scabs from smallpox patients), and vaccine points (a bovine vaccine coated the tip of the needle).[464] Smallpox is a hardy virus that can survive, under the right conditions, for two years outside a human body. Scabs from smallpox victims are especially potent in transmitting the virus and the virus remains viable for a long time. Unfortunately the vaccine points that the agency purchased before and during the epidemic at Hopi had a very short shelf life, making most of the points essentially worthless when it came time to use them. It was not routine to vaccinate people except in response to a threat of an epidemic, this also increased the number of expired vaccination points on hand at the beginning of the epidemic at Hopi.

The Pueblo smallpox outbreak spread to the Hopi mesas in December of 1898 after several Hopi men attended a Shalako Dance at Zuni, though warned not to due to

[464] Ibid., 432.

the smallpox outbreak there.[465] The outbreak began on First Mesa, which, fortunately, was more accessible than the other Mesas. While initial efforts to vaccinate failed, later efforts nearly contained the outbreak, but cases developed on Second Mesa. At this time, Oraibi, which is on Third Mesa, was the largest of the Hopi villages with about thousand residents, so people feared the consequences of the infection reaching Oraibi. Fortunately this did not occur. Two factors led to a higher death toll on Second Mesa: agents and doctors had a difficult time reaching the villages due to rugged terrain and many opposed the government's interference.[466] In the end there were 632 cases. Of those infected, 412 submitted to vaccination and only 24 died, about six percent.[467] The 220 remaining cases refused treatment and 163 died, about seventy-four percent.[468] Clearly those who elected to accept western medical treatment survived in greater numbers than those who elected not to.

The government's actions in the wake of the epidemic caused a renewing and increase in the tension between traditionalists and accommodationalists. *Variola Major*, the virus that caused smallpox, is a hardy virus that can survive, under the right conditions, for upwards of two years in the dried scabs of its victims; or in the fluids left behind on blankets and clothing. In order to prevent further infections and outbreaks,

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[465] Trennert, 353.

[466] Talayesva, growing up in Oraibi and attending the Oraibi school, recalled: "Just before Christmas we heard that a disease, smallpox, was coming west from First Mesa. Within a few weeks news came to us that on Second Mesa the people were dying so fast that the Hopi did not have time to bury them, but just pitched their bodies over the cliff. The government employees and some of the schoolteachers fled from Oraibi, leaving only the principle and missionaries, who said that they would stay" (Talayesva and Simmons, 90-91).

[467] E. Wagner Stearn and Allen E. Stearn, *The Effect of Smallpox on the Destiny of the Amerindian* (Boston: Bruce Humphries Publishers, 1945), 110.

[468] Ibid.

agents and volunteers disinfected the villages that had cases of smallpox. In this process, "using lye and sulphur smoke, workers washed down the ceilings, floors, and walls of homes, burned clothes, buried bodies, and bathed people."[469] Fortunately the corn was spared. From a western perspective, quarantines, fumigation, and the process of disinfecting in the aftermath of an epidemic were common practices. The Hopi, however, saw the actions of the government as unnecessarily destructive, intrusive, and insulting. The government's efforts to help left the Hopi essentially destitute and dependent on the government to replace the items lost. Though meant to prevent another outbreak and save lives, the government's actions further antagonized traditionalists and probably increased their number.

In the late-nineteenth century, germ theory began to replace older filth theories of disease. Jenner developed the first vaccine against smallpox in the eighteenth century, but understanding of why his vaccine worked took more than a hundred years. While it is possible to resolve bacteria, being about 1000 nm in size, with a microscope, resolving viruses, 20 nm to 400 nm in size, would take the invention of the electron microscope in the 1930s. In the United States, germ theory and the new age of public health would not truly begin until the 1920s and 30s. While the agents, teachers, and doctors stationed in Hopiland had a general understanding of medicine, they were not at the cutting edge of medical research and treatments. Indeed, by the late 1898, a glycerinated vaccine, which is more stable and cheaper to produce, was already available and being used in some parts of the U.S. and Europe.[470]

[469] Trennert, 358.

[470] Frost, 445.

Due to contagion theory and having identified the virus, and how it propagates, we can trace the line of infection through the eastern and western pueblos. It is also possible to understand why certain vaccines worked and other failed. We can analyze the outbreak and identify the factors that place people most at risk for infection and possible death. The disinfection process is also logical and necessary to prevent future outbreaks. From the perspective of modern medical science, this outbreak resulted from a natural biological occurrence due to virus and human behavior. Yet from a Hopi perspective the story is not as simple.

What role did Native people play in this epidemic? The Hopi perspective on their experience of the 1899 epidemicis silent in terms of written documentation available to non-Hopis. Considering the event – the trauma and tragedy within and surrounding the outbreak – it is likely this silence will remain. The Hopi perspective of disease, not having a theory of contagion, most likely gave the three men who attended the ceremony at Zuni during the outbreak that by maintaining a good heart, they would not fall ill to smallpox. As the previous outbreak had occurred a generation prior, they may not have understood the deadly potential of the disease. With Hopi theory of disease being different from late-nineteenth century western medicine, quarantines, fumigation, and sterilization methods most likely seemed pointless, ridiculous, and insulting. As western medicine proved effective in limiting the spread of the disease, Hopi healers probably deferred to western treatments, taking note of the procedures and saying prayers and doing quiet rituals to make the treatments more effective. Of course, the statistics show not all accepted western medicine.

Possible interpretations of why individuals rejected western treatments range from anti-American sentiment to hostility between factions. Considering Hopi history and the resentment at American interference and concern of maintaining Hopi life ways, it is possible these individuals blamed the Americans for causing the outbreak, taking advantage of the internal strife and the imbalance it created. Americans, taking the role of *powaqa*, used their power and knowledge against the Hopi, creating a foothold for further interference. This is a conjecture and traditionalists most likely had a very diverse range of justifications for forgoing western medical treatment during the epidemic.

From a Hopi perspective, illness is a result of being out of balance or witchcraft. The first category, being out of balance, covers a broad range of behaviors, attitudes, and decisions. For an individual case, only by taking a patient history and examination with healer specific tools is a healer able to determine the cause.[471] Once the cause is determined, a healer can prescribe a course of treatment. Kennard argued, "Within this system, the idea of chance or accident is virtually ruled out of existence. For every sickness, there is a cure, and death following illness is attributed to the will or lack of strength of the individual rather than to any deficiency in the curing techniques. When an old person dies he is regarded as having reached the end of his road."[472] While there are ceremonies with curative properties, treatment is a simple affair, ranging from medicine made from plants, animals and or minerals, to a simple ritual with prayer and use of

[471] Richard E. Grant, "Tuuhikya: The Hopi Healer," *American Indian Quarterly* 6, no. 3/4 (Autumn - Winter, 1982): 292.

[472] E. A. Kennard, "Hopi Reactions to Death," *American Anthropologist* 39, no. 3 Part 1 (July-September 1937): 494.

objects with healing properties.[473] There is evidence of two Hopi curing societies, the *yayaat* and the *poswimkya*, active in the nineteenth century, but both dissolved by the 1890s and were possibly not of Hopi origin but introduced by other Puebloan groups.[474] Along with a healer, there were also bonesetters.[475] For cases where a healer could not cure a patient, the healer sent the patient to a more skilled healer, thus the presence of western medicine during an epidemic did not undermine the position of Hopi healers.[476] Unlike priests, healers did not occupy important positions within society.[477] Indeed to draw attention to one's abilities is contrary to Hopi ways and an individual flaunting their power would be suspect as a witch.

Though an illness is either natural or supernatural in cause, the individual bears responsibility. Imbalance and disharmony may result in illness or accident.[478] Therefore "bad thoughts, improper actions, disbelief, emotional imbalance and anxiety were all causes of illness."[479] When an individual, or community, is out of balance, they are susceptible to illness and disease, whether natural or supernatural in origin.[480] Emotional imbalance can be caused by hatred, jealousy, envy, extreme sorrow, or anger; emotions,

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[473] Alfred F. Whiting, "Leaves from a Hopi doctor's casebook," *Bulletin of the New York Academy of Medicine* 47, no. 2 (1971): 126. Simple in comparison to the blessingway ceremonies of the Navajo which can be quite elaborate, including, for example, one or more sizable sand paintings.

[474] Jerrold E. Levy, "Hopi Shamanism: A Reappraisal," in *North American Indian Anthropology: Essays on Society and Culture*, ed. Raymond J. DeMallie and Alfonso Ortiz (Norman: University of Oklahoma Press, 1994), 310.

[475] Whiting, 126-127.

[476] Grant, 295.

[477] Levy, 324.

[478] Grant, 291.

[479] Levy, 318.

[480] Grant, 291.

no doubt, felt by many during the 1890s, especially in Oraibi.[481] Just as negative thoughts of a few individuals can ruin a ceremony and put their community at risk, such thoughts open individuals to possible bad health, which in turn, as in case of an infectious disease, places the whole community at risk of an epidemic. The greater the number of people involved the increasing likelihood of a failed ceremony or an outbreak of disease. The underlying social tensions of the 1890s produced emotional imbalance, opening Hopi communities to drought, famine, and disease, all which occurred at the end of the nineteenth century.

How did the smallpox outbreak of 1899 change Hopi society? Arguably the tension between factions over what outside influences to accommodate or reject resulted from outside pressure, a pressure the Hopi could not simply ignore. Yet even though the federal government enforced certain aspects with military force and presence, the reactions were uniquely Hopi, occurring within their cultural framework. Hopis reactions to western colonization are a product of Hopi culture. Ishii writes, "Our methods for using the past have concretely affected our understanding of the world and how we should proceed in this day and age… [History] provides identity to a nation or group, and enlists people to uphold that past as a form of government with ideals that benefit those who believe."[482] Unlike most Native nations in the United States, the Hopi are within their traditional homelands, though not all of it falls within the Tribe's legally defined territory. Therefore it is easier to argue that the effects of colonization are not as great on them as with groups. As the intention of colonization is genocide, as first

[481] Ibid.

[482] Ishii, 169.

defined by Raphael Lemkin in 1943, which encompasses cultural, social, political, physical, and economic dissolution of a group, the degree of destruction depends on the circumstance. As Native people have demonstrated, they and their cultures have survived – they have survived because their cultural frameworks remain, and this framework influences the change they undergo.

As records indicate, leading up to the outbreak, an uneasy truce existed between those who accepted sending their children to school and those who did not. Perhaps if the Hopi and Indian agents agreed on an on-going policy of regularly vaccinating children and adults against smallpox and other preventable diseases, thus preventing epidemics, individuals opposed to the government schools would have eventually accepted the schools for the benefits they could bring to the tribe. Such as a line of thought is wishful thinking considering Americans intended schools to assimilate Native children into a western lifestyle and way of thinking. The agency's interference and cleansing methods after the epidemic passed strengthened the underlying frustration of the traditionalists. Undoubtedly the agency's actions did not endear them to many and increased the number of individuals against adopting any of the agency's actions. Yet during the epidemic, a large percentage of traditionalists died, causing a shift in the balance of power towards those willing to accommodate the agency. By 1906 two things became clear, the prophecy concerning Oraibi near fulfillment and the traditionalists would add another chapter to their migration stories.

In remembering the spilt, Qoyawayma shared,

> In their hour of stress, the Hopis forgot their own tenets. They had been warned since infancy against bitter thoughts. They had been told repeatedly that revenge was not for the Hopi, yet friction, smoldering but intense, was developing

> between Chief Lololoma and Yeokeoma, leader of the Spider Clan…Yeokeoma could not talk of the white man and the Bear Clan's acceptance of him without anger… [Yeokeoma] wanted to continue in the old way of the Hopi, with no deviation such as schooling.[483]

As time passed, it became clear that both factions could not remain in Oraibi and "a change was coming."[484] Qoyawayma's father told her how Yeokeoma clarified "No blood must be shed."[485] In early September of 1906, the expected, even prophesied, confrontation arrived. "It had begun early in the morning," Qoyawayma recalled,

> with Chief Tawaquatewa taking the initiative. He had ordered the hostile conservative reinforcements from Shungopovi [on Second Mesa] to leave the village, and they, backed by Yeokeoma and his followers refused…By late afternoon of that seventh day of September, the opposing factions were lined…facing each other, and Yeokeoma drew with his bare big toe a line running east to west…"If your men are strong enough to push us away from the village," he is said to have told Tawaquaptewa, "and to pass me over the line, it will be done. But if we pass you over the line, it will not be done and we shall have to live here.[486]

In the end, after fierce contest, Tawaquaptewa and his supporters pushed Yeokeoma over the line and, after admitting defeat, Yeokeoma and his supporters left Oraibi. The group that had split off from Hotevilla attempted to return to Oraibi, but Oraibians rejected them and thus settled at Bacavi. Qoyawayma's parents, though traditionalists, remained at Oraibi, but perhaps due to the tension and wound of the spilt, she conjectures, they eventually moved off the mesa to New Oraibi, now called Kykotsmovi. In her retelling, Qoyawayma observed, "It was not immediately apparent that Oraibi had been torn apart on the day of the struggle. For a time dances were conducted as usual, but Oraibi had

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[483] Qoyawayma, 31-32.

[484] Ibid.

[485] Ibid., 32.

[486] Ibid., 43-44 and 45-46.

been depleted of the clansmen necessary for observance of some of the rituals" and "Old Oraibi began to dwindle in population. More and more families followed the example of [her parents], and the stone houses of Old Oraibi slowly emptied."[487] Further she contents, "Bear Clan lost face by the break in the Hopi ranks. Ancient leaders of Oraibi and Hopiland, they had gone against everything they had been taught since childhood…They had committed sins that they could not spit out over their shoulders at prayer time."[488] The division that caused the split echoes throughout Hopi history and continues to cause tension, especially after the establishment of the Tribal Council through adoption of the Indian Reorganization Act on June 18, 1934; the Hopi Tribal Council adopted a constitution on December 19, 1936.[489] Similar to the issues that caused the Oraibi Split, the formation of the tribal council, as it usurped traditional tribal leadership, divided the Hopi tribe.

For the Hopi people, the cycle of time continues as it has and they continue to live the life plan given to them by *Maasaw* when they emerged into this world from the world below. Wall and Masayesva, in their article "People of the Corn," interviewed Leigh Kuwanwisiwma, Hopi Cultural Preservation officer, about the future of the Hopi and their traditions. "No longer can we say this is a "white man's world" and we're up here separate from that world on these mesas," Kuwanwisiwma explained,

> We're part of the dominant culture. We too have become influenced materialistically through the cash economy, with different kinds of value systems that have become our way of life…social responsibility to family can be strengthened if younger people can appreciate what it means to be part of the

[487] Ibid., 47 and 28.

[488] Ibid., 48.

[489] The tribal council was disbanded in 1943 and reestablished in 1950.

> Hopi way through farming. Participation in the ceremonies, as we see now with younger kids being initiated and participating, is important. They need to be told in kivas, in the homes, that the corn is the way the Hopis have chosen; it goes back to our Emergence. As Hopi people, we are fortunate to have survived this long. It is a privilege to be a part of this complex Hopi community of clans living under this one philosophy of corn, of humility. I think if we can continue to teach that, we'll strengthen the culture as it stands."[490]

Similar to the generations that came before them, even the generations who lived before European colonization, today's Hopi must reinterpret what it means to be Hopi and determine how best to live out the life plan given to them.

Sometime in the sixteenth or seventeenth centuries, imported European diseases arrived at Hopiland, drastically reducing the population and changing the Hopi people. The story of disease in Hopiland over the centuries is not accessible, but the 1899 outbreak, and the circumstances surrounding it, offers insight into how the Hopi people reacted and survived the trauma caused by imported disease and by colonialism. Similar to the Black Death in Europe, smallpox acted as a catalyst of change – it increased and revived tensions between those open to adopting Western ways and those who rejected them. How did the Hopi survive the epidemic? While individual reactions differed, collectively they responded by either increasingly accommodating westerners or increasing their anger and resentment. The trauma of the Oraibi Spilt of 1906 overshadowed the trauma of the epidemic, but in surviving both, the Hopi life plan provided the solid foundation from which the Hopi people could weather such dark and devastating times, surviving to the present and into the distance future with a culture and society changing and adapting to the times but remaining true to the life plan given to them by *Massauw*.

[490] Well and Masayesva, 453.

CHAPTER 6

CONCLUSION

The question is not if but when the next global pandemic will occur. In mid-October 2014, with the number of Ebola virus disease cases reaching 9,000, with a seventy percent mortality rate, many feel as though the next global pandemic has arrived. Fortunately Ebola has a weakness that neither smallpox nor the bubonic plague have, Ebola is not airborne. With mortality rates similar to the Black Death or virgin population outbreaks of *Variola major*, an airborne strain of Ebola could forever alter the course of human history. The most likely scenario is the current hot spots of Ebola will remain in Africa, with pockets of infection breaking out on a limited scale on other continents. While the fearful potential of Ebola may cause the global concerns, the panic, fear, misunderstanding, misinformation, scapegoating, and social breakdown, occurring in the current Ebola hot spots – Guinea, Sierra Leone, and Liberia – will continue to haunt the survivors long after those not directly affected move on to new concerns. The question is not if the peoples and countries in the Ebola hot spots will change, but how. The trauma of high death tolls, waiting for twenty-one days to see if you will develop the same disease killing your loved ones, watching society breakdown around you, and the omnipresent of fear will leave an impact on people and societies. The space created by this unwelcomed traveler, Ebola, may result in renewed civil wars, a shift in burial traditions, or a push for modernization of the medical infrastructure by the people and governments of the countries affected. History teaches, whether Ebola, smallpox, or the bubonic plague, when the unwelcomed traveler brings an outbreak, change is inevitable.

In spring 2012, I submitted a permit proposal to the Hopi Cultural Preservation Office in hopes of conducting oral interviews with residents of Hopiland. I received no reply and accepted this as a polite and silent no. My contact at the HCPO called me to explain the situation and through our conversation, I gained valuable insight into Hopi culture and the meaning of their silent response to my proposal. From an academic perspective, the history surrounding the Oraibi Split is ripe for analysis, a case study through which to develop theoretical models and interdisciplinary inquiry. The voices available to scholars in the primary sources from the 1890s and 1900s are largely non-Hopi, making it difficult to write a history of this period from the third dimension. Further complicating matters, at the time of the smallpox outbreak, the day schools, the purchase of supplies, and preventing the spread of smallpox were the main concerns of U.S. Indian Agent G. W. Hayzlett, who oversaw the Navajo and Moqui Pueblo agencies, and those employed by the agencies. Missing from Hayzlett's letters, as well as those written by Samuel E. Shoemaker and others, were the thoughts and experience of the Hopi. Using these documents to piece together the Hopi experience during this outbreak is like chasing a ghost. The silence I encountered meant, unlike the English and the Black Death, I had to reconstruct the Hopi experience using Hopi history and beliefs.

In the 1955 Hopi Hearings, Dan Katghongva of Oraibi began his testimony by explaining,

> We of Oraibi know that Oraibi is the mother of all our life pattern, because it is there that these things were laid down for us, and it is there that these things will be settled in the future. Now we are faced with many problems today because there are two people in this land. Some are working away from the life pattern, and they are using force and scaring other people into following their ways,

> because they are the ones who have turned away and destroyed these instructions which we have obtained from our forefathers[491]

The struggle Katghongva speaks of is not simply the tension between generations and the distances between how young and old interprets and carries forward tradition; it is the struggle between the introduction and imposition of an outside culture into Hopi life and the consequences of foregoing the life plan given to the Hopi when they enter this world. His words echo those spoken during the 1890s and 1900s leading up to the Oraibi Split in 1906. The combination of factors underlying the breakup of Oraibi demonstrates the complexities of the forces driving human history. There are many catalysts of change, with the interactions of humans and disease being just one of them. Disease imported into a community acts as a catalyst of change by disrupting its balance or order, creating space for change, and, ultimately, accelerating change.

A society's culture, like the Hopi and the English, provides the framework for how individuals will interpret and react to events and experiences. In order words, cultural framework provides a system for living, which provides a means, a measure, to identify and strive for normalcy. Culture is not rigid and unchanging, for experiences change people and, possibly, their interpretation of their culture. The collective memory of each generation is different from those before and after it, and memories influence interpretations and responses. Differing experiences will influence the interpretations of the knowledge, traditions, and wisdom passed from elders to younger generations. For any society, the loss of elders due to disease has ramifications on the passage of cultural knowledge and memory.

[491] Hopi Hearings, 257

Disease creates space, or opportunity, for change and for balance to return. Thus disease is a catalyst of change because of how humans respond to it. As discussed in chapter 5, for the Hopi, disease can be the result of individuals' bad hearts, neglecting their life way, witchcraft, and general imbalance. When an outbreak of disease occurs, it becomes necessary to determine the cause of the outbreak so to return the individuals and community back to balance and order. To determine the cause and the resolution, they will draw from their life plan. In the case of the Oraibi Split, the smallpox outbreak increased underlying tensions in Hopiland and accelerated the inevitable division of Oraibi.

If culture provides the framework for human response and interpretation, than pandemics test cultural stability. For the Hopi and the English, their framework proved flexible enough to survive potentially shattering epidemics. Cultural flexibility allows for adaptation and resiliency, leading to cultural survival. In adapting to the aftermath of disease, it was only the cultural expressions that altered and not their foundations. For England, a multicultural nation, its unwritten social structure and social expectations provided stability, both of which underwent transformation by the unwritten becoming codified in the wake of the plague. Similar to the mounting social tensions before the Black Death in England, there were mounting social tensions in Hopiland. In addressing these tensions, especially those added after the outbreak, the Hopi life plan provided the solution to restore peace and balance, in this case through destruction and renewal.

To quote Viktor Frankl, "If there is a meaning in life at all, then there must be meaning in suffering. Suffering is an ineradicable part of life, even as fate and death. Without suffering and death human life cannot be complete" and it is up to each person to

decide how they will accept such a fate. In order to survive a shattering epidemic, an individual and a group must find meaning, or hope, in their suffering. In having an aim, goal, or purpose, an individual can survive suffering that shatters and destroys. An individual's reasons for continuing have roots in the cultural framework they function within.

Armin Geertz argued, "…persistence and change are aspects of the same social phenomenon, namely, tradition. In order for a tradition to remain viable, it must be resilient on the one hand and malleable on the other. It must change in order to retain meaning in the face of changing social and political circumstance."[492] Tradition expresses and embodies a people's cultural framework. Similar to Geertz, Steadman Rushforth and Scott Upham argue "Human action frequently results from decisions people make in pursuit of goals they establish in the contexts of their own cultural systems and traditions."[493] In other words, a person's cultural framework places constraints on the meaning people use to explain and survive trauma. This is evident in the actions of the fourteenth-century English and nineteenth-century Hopi.

Considering the fourteenth century as a whole, England was on the cusp of change and the Black Death and the subsequent plague outbreaks were the instrument of change, allowing the English to reimagine themselves while retaining the essential qualities of their culture – exemplified in a defined social structure with corresponding requirements of behavior and responsibilities to God and country. As discussed in

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[492] Armin W. Geertz, "Theories on Tradition and Change in Hopi Studies," *Anthropos* (1993): 495.

[493] Scott Rushforth and Steadman Upham, *A Hopi Social History: Anthropological Perspectives on Sociocultural Persistence and Change* (Austin: University of Texas Press, 1992), 6.

chapter three, the reaction of the nobility and gentry to tighten social controls, with the passage of laws dictating what people could buy, wear, and eat based on income, was a purposeful reaction to the increase social and financial mobility in the wake of the plague. Edward III's strong leadership kept the nobility and gentry unified and England's war against France required, even if it limped, for production of goods to continue. While people attempted to flee from the plague, not all could migrate nor did migration always bring protection, the average peasant did not have the means to travel or a place to which escape. Managers of estates had the responsibility to collect the required annual refurbishments from peasants associated with each estate; John Ronewyk, manager of Farnham, an estate of Bishop Edendon's diocese, proved capable in maintaining the estates production output during the height of the plague. This sustain production suggests that while the populace suffered collectively from dementia of despair, uncertain if there was a future for mankind, the stability provided by one's station pushed them forward. As the population contracted, landholdings opening up, and with better paying job opportunities increasing in towns and cities, the rigid social structure became more fluid, allowing physical and financial mobility, allowing people to reimagine themselves within English culture, while prompting others to increase social controls and hierarchies. People's reaction to the plague transformed the cultural framework that gave England stability during the Black Death as well as opened space for underlying trends of change to take root.

For the Hopi, their life plan given to them by *Massauw* provided the stable structure that helped them through the period of instability around the turn of the twentieth century. Using the past to understand events, not only the growing tension but

the famine, droughts, and disease effecting Hopiland during this period. Taking a century-long-view of the Hopi, conflicts with the Navajo, the ever present possibility of drought and famine, and the outbreak of disease dominated the fifty years before the Oraibi Split or the 1899 outbreak. In the fifty years afterwards, conflict with the U.S. federal government dominated, with continuing conflict with the Navajo, droughts, and disease. Even with outside pressure and resulting structural changes, such as the formation of the tribal council and repartitioning of disputed Hopi and Navajo land, the changes from within. Just as the Hopi carefully decided which ear of corn they would select for ceremonial purposes or for the following year's planting, it is possible to see their reactions to crisis, constrained by culture and social expectations, as intentional. With respect to the Split, on that September day, Tawaquatewa and Yeokeoma actively decided the matter through a pushing contest on September 8, 1906. The return of some members of the ousted group to Oraibi afterwards suggests that, for some, the decision to support Yeokeoma stemmed from an emotional decision: social expectation of members of their family or clan, or other such reasons. As for malleability, the Hopi villages still continue to be more of a federation than a unified political body, some villages being labeled more conservative than other, it is evident that Hopi cultural framework, their life plan, is flexibility and malleable enough to endure crisis.

Placing the fourteenth-century English beside nineteenth-century Hopi provides unexpected insight into the ideas of identity and culture, with respected to the idea of a national character. The England in this study is an example of a political nation, defined as "a political (not an ethnic) community. It puts the stress on willed, active citizenship, and on civic participation. It is an artificial, deliberately 'invented' community, brought

into being to fulfill certain desired purposes of the political life. It is a 'community of choice,' membership of which depends in principle on voluntary inclusion in the political community."[494] The concept of nation is a modern concept, a "product of modernity," so "political state" would be more appropriate of a descriptor of England during the pre-modern era.[495] As a product of conquests and invasions, English culture during the fourteenth century is difficult to define, thus resulting in my analysis of the effects of the Black Death on the English focusing on the pandemic's social, political, and economic impact.

In contrast, the Hopi form a cultural nation. In defining "cultural nation," Krishan Kumar writes, "The cultural nation is defined by what it considers really binds people together: not the 'superficial' ties of political citizenship but the deep ties of history, language, literature and religion…In practice cultures are so various, so individual, so separate, so incommensurable, that to become a member of another culture is almost like changing one's skin or even one's species."[496] Unlike the English origin story of conquest and invasion, the Hopi's origin stories, namely the migration stories, reveal how the Hopi formed through active choice – clans could only join a village with permission and failure to maintain the Hopi life plan, as seen with Awat'ovi, could result in willful destruction for the protection of the people as a whole. The origins of the English and the Hopi serve to demonstrate how the internal priorities of the people in question direct whether a people develop into a state, nation, or nation-state. While the English sought

[494] Krishan Kumar, *The Making of English National Identity* (Cambridge: Cambridge University Press, 2003), 22-23.

[495] Antony Easthrope, *Englishness and National Culture* (London: Routledge, 1999), 3.

[496] Kumar, 24.

conquest so to increase power, the Hopi sought to maintaining balance through their life plan – the interpretation of such continuing to change over time.

Moving forward as a people and a nation in the aftermath of a traumatic outbreak of disease means overcoming the effects of trauma and grieving, the degree of each depending on individual experiences; it also means choosing to rebuild in the ashes and memories of what once was. The English and Hopi used the past in different ways as they strove to rebuild what was lost. For the English, many used the past as an ideal and a warning – though seeking to restore the pre-plague social structure, people wished to remove the negative behaviors thought to have caused the plague. For the Hopi history is a means by which to understand the present.

How does a society survive a shattering epidemic? An epidemic that causes social cohesion and civility to crumble as people face illness and death? As individuals face their and their loved ones mortality? In my journey to understand the answers to these questions, and those related to them, I found a universal human drive to restore normalcy after one's world is turn upside down. Normalcy is balance and order, which depends on the cultural values and teachings of the society in question. As the circumstances of life changed, whether a result of the introduction of disease, outside influences, or internal tensions, people cling to the idea and mental image of their perception of normalcy, waiting for the storm to pass so they can rebuilt from the ashes left. In the two case studies of the interaction of humans and disease, I found the meaning people find in their suffering gives them the hope to continue forward. Trauma is an indication something is out of balance and in order to restore balance, a person or people return to that which structures and informs them of their place in this world and

their purpose. The connection between the English and the Hopi is not the structure of their societies, but their drive to restore balance in a world turned upside down.

BIBLIOGRAPHY

Primary Sources

Aberth, John. *The Black Death, 1348-1350: The Great Mortality of 1348-1350: a Brief History with Documents*. Boston: Bedford/St. Martin's, 2005.

Arizona State Department of Health. *Annual Report Fiscal Year 1946/1947.*

Arizona State Department of Health. *Annual Report Fiscal Year 1947/1948.*

Horrox, Rosemary, editor and translator. *The Black Death*. Manchester Medieval Sources Series. Manchester: Manchester University Press, 1994.

Knighton, Henry, and G. H. Martin. *Knighton's Chronicle 1337-1396*. Oxford: Clarendon Press, 1995.

Liveing, Henry George Downing. *Records of Romsey Abbey: An Account of the Benedictine House of Nuns with Notes on the Parish Church and Town (AD 907-1558): Compiled from Manuscript and Printed Records*. Warren and son, 1906.

Lockhart, James, and Bernardino de Sahagún. *We People Here: Nahuatl Accounts of the Conquest of Mexico*. Berkeley: University of California Press, 1993.

Piazza, Michele da. *Cronaca*. Edited by Antonino Giuffrida. Palermo: ILA Palma, 1980.

Rāzī, Abū Bakr Muḥammad ibn Zakarīyā. *A Treatise on the Small-pox and Measles*. Syndenham Society, 1848.

Singer, Dorothea Waley. "Some plague tractates (fourteenth and fifteenth centuries)." *Proceedings of the Royal Society of Medicine* 9, Section of the History of Medicine (1916): 159-212.

The Statutes of the Realm, Printed by command of his majesty King George the Third. In pursuance of an address of the House of Commons of Great Britain. From Original Records and Authentic Manuscripts , Volume 1. Buffalo: William S. Hein and Company, 1993.

United States. *Hopi Hearings, July 15-30, 1955*. Keams Canyon: The Bureau, 1955.

Voth, Henry R. "Notes on Modern Burial Customs of the Hopi of Arizona." *Publications of the Field Museum of Natural History. Anthropological Series* 11, no. 2, Brief Miscellaneous Hopi Papers. The Stanley McCormick Hopi Expedition (February, 1912): 99-103.

Voth, Henry R., ed. *The Traditions of the Hopi*. Volume 8. Field Columbian Museum, 1905.

Whipple, Amiel Weeks. *Report of Explorations for a Railway Route, Near the Thirty-Fifth Parallel of Latitude: From the Mississippi River to the Pacific Ocean.* Washington, D.C.: Government Printing Office, 1854.

Secondary Sources

Books

Alchon, Suzanne A. *A Pest in the Land: New World Epidemics in a Global Perspective*. Albuquerque: University of New Mexico Press, 2003.

Arnold, David. *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India*. Los Angeles: University of California Press, 1993.

Benedictow, Ole. *The Black Death 1346-1353: The Complete History*. Rochester: Boydell Press, 2006.

Binski, Paul. *Medieval Death: Ritual and Representation*. Ithaca: Cornell University Press, 1996.

Boylston, Arthur W. *Defying Providence: Smallpox and the Forgotten 18th Century Medical Revolution*. CreateSpace Independent Publishing Platform, 2012. Kindle.

Bray, R. S. *Armies of Pestilence: The Impact of Disease on History*. New York: Barnes and Noble Books, 1996.

Byrne, Joseph P. *Encyclopedia of Pestilence, Pandemics, and Plagues*. Westport: Greenwood Press, 2008.

Byrne, Joseph P. *The Black Death*. Westport: Greenwood Press, 2004.

Cantor, Norman F. *The Last Knight: The Twilight of the Middle Ages and the Birth of the Modern Era*. New York: Free Press, 2004.

Clemmer, Richard O. *Continuities of Hopi Culture Change*. Ramona: Acoma Books, 1978.

Clemmer, Richard O. *Roads in the Sky: The Hopi Indians in a Century of Change*. Boulder: Westview Press, 1995.

Crosby, Alfred. *The Columbian Exchange: Biological and Cultural Consequences of 1492*. Westport: Greenwood Press, 1972.

Courlander, Harold. *The Fourth World of the Hopis*. New York: Crown Publishers, 1971.

Cantor, Norman. *In the Wake of the Plague: the Black Death and the World it Made*. New York: The Free Press, 2001.

Dixon, Cyril W. *Smallpox*. London: J & A Churchill, 1962.

Dobyns, Henry F. *Their Number Become Thinned: Native American Population Dynamics in Eastern North America.* Knoxville: University of Tennessee Press, 1983.

Dols, Michael W. *The Black Death in the Middle East*. Princeton: University of Princeton Press, 1977.

Easthorpe, Antony. *Englishness and National Culture*. London: Routledge, 1999.

Fenn, Elizabeth A. *Pox Americana: The Great Smallpox Epidemic of 1775-82*. New York: Hill and Wang, 2001.

Fixico, Donald. *Call for Change: The Medicine Way of American Indian History, Ethos, and Reality*. Lincoln: University of Nebraska Press, 2013.

Frankl, Viktor E. *A Man's Search for Meaning: an Introduction to Logotherapy*. Translated by Ilse Lasch. Revised Edition. Boston: Beacon Press, 1962.

Fromherz, Allen James. *Ibn Khaldun: Life and Times*. Edinburgh: Edinburgh University Press, 2011.

Goldberg, P. J. P. *Medieval England: A Social History 1250-1550*. London: Arnold, 2004.

Gottfried, Robert S. *The Black Death: Natural and Human Disaster in Medieval Europe*. New York: The Free Press, 1983.

Hays, J. N. *The Burden of Disease: Epidemics and Human Response in Western History*. New Brunswick: Rutgers University Press, 1998.

Hopkins, Donald R. *The Greatest Killer: Smallpox in History.* Chicago: University of Chicago Press, 2002.

Huppert, George. *After the Black Death: A Social History of Early Modern Europe*. Indianapolis: Indiana University Press, 1998.

James, Harry C. *Pages from Hopi History*. Tucson: University of Arizona Press, 1974.

Kelly, John, *The Great Mortality: An Intimate History of the Black Death, the Most Devastating Plague of All Time*. New York: HarperCollins Publishers, 2005.

King, Edmund. *England 1175-1425*. New York: Charles Scribner's Sons, 1979.

Kiple, Kenneth F. *Plague, Pox & Pestilence*. London: Weidenfeld & Nicolson, 1997.

Kumar, Krishan. *The Making of English National Identity*. Cambridge: Cambridge University Press, 2003.

Lynn, John A. *Women, Armies, and Warfare in Early Modern Europe*. Cambridge: Cambridge University Press, 2008.

Mullett, Charles F. *The Bubonic Plague and England: An Essay in the History of Preventive Medicine*. Lexington: University of Kentucky Press, 1956.

Naphy, William, and Andrew Spicer. *Plague: Black Death and Pestilence in Europe*. Gloucestershire: Tempus, 2004.

Qoyawayma, Polingaysi, and Vada F. Carlson. *No Turning Back: A True Account of a Hopi Indian Girl's Struggle to Bridge the Gap between the World of Her People and the World of the White Man*. Albuquerque: University of New Mexico Press, 1964.

Palmer, Robert C. *English Law in the Age of the Black Death, 1348-1381: A Transformation of Governance and Law*. Chapel Hill: University of North Carolina Press, 1993.

Platt, Colin. *King Death: The Black Death and Its Aftermath in Late-Medieval England*. London: University College London Press, 1996.

Porter, Stephen. *The Great Plague*. Gloucestershire: Sutton Publishing, 1999.

Pounds, Norman J. G. *The Medieval City*. Westport: Greenwood Press, 2005.

Prestwich, Michael. *Plantagenet England, 1225-1360*. Oxford: Clarendon Press, 2005.

Raibmon, Paige. *Authentic Indians: Episodes of Encounter from the Late-Nineteenth-Century Northwest Coast*. Durham: Duke University Press, 2005.

Rawcliffe, Carole. *Medicine and Society in Later Medieval England*. Stroud: Alan Sutton Publishing, 1995.

Reischauer, August Karl. *Studies in Japanese Buddhism*. 1917. Reprint. New York: AMS Press, 1970.

Robertson, R. G. *Rotting Face: Smallpox and the American Indian*. Caldwell: Caxton Press, 2001.

Rushforth, Scott, and Steadman Upham. *A Hopi Social History: Anthropological Perspectives on Sociocultural Persistence and Change*. Austin: University of Texas Press, 1992.

Sherman, Irwin W. *The Power of Plagues*. Washington, D.C.: ASM Press, 2006.

Shrewsbury, John Findlay Drew. *A History of Bubonic Plague in the British Isles*. London: Cambridge University Press, 1970.

Spicer, Edward H. *Cycles of Conquest: The Impact of Spain, Mexico, and the United States on the Indians of the Southwest, 1533–1960.* Tucson: University of Arizona Press, 1962.

Stearn, E. Wagner, and Allen E. Stearn. *The Effect of Smallpox on the Destiny of the Amerindian.* Boston: Bruce Humphries Publishers, 1945.

Talbot, C. H. *Medicine in Medieval England*. London: Oldbourne Book Company, 1967.

Tuchman, Barbara W. *A Distant Mirror: The Calamitous 14th Century*. New York: Alfred A. Knopf, 1978.

Turville-Petre, Thorlac. *England the Nation: Language, Literature, and National Identity, 1290-1340*. Oxford: Clarendon Press, 1996.

Waugh, Scott L. *England in the Reign of Edward III.* New York: Cambridge University Press, 1991.

White, Albert Beebe, and Wallace Notestein, eds. *Source Problems in English History*. New York: Harper and Brother Publishers, 1915.

Whiteley, Peter M. *Deliberate Acts: Changing Hopi Culture Through the Oraibi Split*. Tucson: University of Arizona Press, 1988.

Williams, S. Wells. *The Middle Kingdom: A Survey of the Geography, Government, Literature, Social Life, Arts, and History of the Chinese Empire and its Inhabitants*. Revised edition, volume II. New York: Charles Scribner's Sons, 1901.

Woolgar, C. M., D. Serjeantson, and T. Waldron. *Food in Medieval England: Diet and Nutrition*. Oxford: Oxford University Press, 2006.

Ziegler, Philip. *The Black Death*. New York: John Day Company, 1969.

Articles and Book Chapters

Adams, E. Charles, and M. Nieves Zedeño. "BAE Scholars as Documenters of Diversity and Change at Hopi, 1870-1895." *Journal of the Southwest* 41, no. 3 (Autumn 1999): 311-334.

Barquet, Nicolau, and Pere Domingo. "Smallpox: The Triumph over the Most Terrible of the Ministers of Death." *Annals of Internal Medicine* 127, no. 8 (October 15, 1997): 635-643.

Bernardini, Wesley. "Identity as History: Hopi Clans and the Curation of Oral Tradition." *Journal of Anthropological Research* 64, no. 4 (Winter 2008): 483-509.

Black, Francis. "Why Did They Die?" *Science*, New Series, 258, no. 5089 (December 11, 1992): 1739-1740.

Black, Mary E. "Maidens and mothers: an analysis of Hopi corn metaphors." *Ethnology* 23, no. 4 (1984): 279-288.

Bolton, Jim. "'The World Upside Down' Plague as an Agent of Economic and Social Change." In *The Black Death in England, 1348-1500*, edited by Mark Ormrod and P. G. Lindley, 17-78. Stamford: Watkins, 1996.

Bonatto, Sandro L., and Francisco M. Salzano. "A single and early migration for the peopling of the Americas supported by mitochondrial DNA sequence data." *Proceedings of the National Academy of Sciences* 94, no. 5 (1997): 1866-1871.

Boroda, Krzysztof. "Plague and Changes in Medieval European Society and Economy in the 14th and 15th Centuries." *The Journal of Arts and Science* 10, no. 1 (2008): 49-58.

Bray, Mike, and Mark Buller. "Looking back at smallpox." *Clinical Infectious Diseases* 38, no. 6 (2004): 882-889.

Broadberry, S., B. Campbell, and B. van Leeuwen. "English Medieval Population: Reconciling time series and cross sectional evidence." *University of Warwick unpublished manuscript* (2010).

Cunha, Burke A. "The cause of the plague of Athens: plague, typhoid, typhus, smallpox, or measles?" *Infectious disease clinics of North America* 18, no. 1 (2004): 29-43.

Cushing, Frank H., Jesse W. Fewkes, and Elsie W. Clews Parsons. "Contributions to Hopi History." *American Anthropologist* 24, no. 3 (July-September 1922): 253-298.

Dockstader, Frederick J. "Hopi History, 1850-1940." In *Handbook of North America Indians*, volume 9: *The Southwest*, edited by Alfonso Ortiz. Washington D.C.: Smithsonian Institution, 1979: 524-532.

Drancourt, Michel, and Didier Raoult. "Molecular insights into the history of plague." *Microbes and Infection* 4, no. 1 (2002): 105-109.

Eggan, Dorothy. "Instruction and Affect in Hopi Cultural Continuity." *Southwestern Journal of Anthropology* 12, no. 4 (Winter, 1956): 347-370.

Frost, R. H. “The Pueblo Indian Smallpox Epidemic in New Mexico, 1898-1899.” *Bulletin of the History of Medicine* 64, no. 3 (1990): 417-45.

Geertz, Armin W. “A Reed Pierced in the Sky: Hopi Indian Cosmography on Third Mesa, Arizona.” *Numen* 31, no. 2 (December 1984): 216-241.

Geertz, Armin W. “Theories on Tradition and Change in Hopi Studies.” *Anthropos* 88, no. 4/6 (1993): 489-500.

Getz, Faye Marie. “Black death and the silver lining: meaning, continuity, and revolutionary change in histories of medieval plague.” *Journal of the History of Biology* 24, no. 2 (1991): 265-289.

Grant, Richard E. “Tuuhikya: The Hopi Healer.” *American Indian Quarterly* 6, no. 3/4 (Autumn - Winter, 1982): 291-304.

Gubser, Caroline, and Geoffrey L. Smith. “The sequence of camelpox virus shows it is most closely related to variola virus, the cause of smallpox.” *Journal of General Virology* 83, no. 4 (2002): 855-872.

Hammarlund, Erika, Matthew W. Lewis, Scott G. Hansen, Lisa I. Strelow, Jay A. Nelson, Gary J. Sexton, Jon M. Hanifin, and Mark K. Slifka. “Duration of antiviral immunity after smallpox vaccination.” *Nature Medicine* 9, no. 9 (2003): 1131-1137.

Harper-Bill, Christopher. “The English Church and English Religion after the Black Death.” In *The Black Death in England, 1348-1500*, edited by Mark Ormrod and P. G. Lindley. Stamford: Watkins, 1996: 79-123.

Kennard, E. A. “Hopi Reactions to Death.” *American Anthropologist* 39, no. 3 Part 1 (July-September 1937): 491-496.

Littman, Robert J., and Maxwell L. Littman. “Galen and the Antonine plague.” American Journal of Philology 94 (1972): 243-255.

Kowaleski, Maryanne. “A Consumer Economy.” In *A Social History of England, 1200–1500*, edited by Rosemary Horrox and W. Mark Ormrod. Cambridge University Press, 2006: 238-259.

Levy, Jerrold E. “Hopi Shamanism: A Reappraisal.” In *North American Indian Anthropology : Essays on Society and Culture*, edited by Raymond J. DeMallie and Alfonso Ortiz, 307-327. Norman: University of Oklahoma Press, 1994.

Littman, Robert J. “The plague of Athens: epidemiology and paleopathology.” *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine* 76, no. 5 (2009): 456-467.

MacNalty, Arthur S. “The Illness of Edward the Black Prince.” The British Medical Journal 1, no. 4910 (February 12, 1955): 411.

McCaa, Robert. “Spanish and Nahuatl views on smallpox and demographic catastrophe in Mexico.” *Journal of Interdisciplinary History* 25, no. 3 (1995): 397-431.

Modanlou, Houchang D. “A tribute to Zakariya Razi (865–925 AD), an Iranian pioneer scholar.” *Archives of Iranian Medicine* 11, no. 6 (2008): 673-677.

Morelli, Giovanna, Yajun Song, Camila J. Mazzoni, Mark Eppinger, Philippe Roumagnac, David M. Wagner, Mirjam Feldkamp et al. “*Yersinia pestis* genome sequencing identifies patterns of global phylogenetic diversity.” *Nature Genetics* 42, no. 12 (2010): 1140-1143.

Ormrod, W. Mark. “The Peasants’ Revolt and the Government of England.” *The Journal of British Studies* 29, no. 1 (1990): 1-30.

Polyak, Victor J., and Yemane Asmerom. “Late Holocene climate and cultural changes in the southwestern United States.” *Science* 294, no. 5540 (2001): 148-151.

Potter, Christopher W. “A history of influenza.” *Journal of Applied Microbiology* 91, no. 4 (2001): 572-579.

Raach, John H. “English medical licensing in the early seventeenth century.” *The Yale Journal of Biology and Medicine* 16, no. 4 (1944): 267-288.

Ramenofsky, Anne, Alicia K. Wilbur, and Anne C. Stone. “Native American Disease History: Past, Present, and Future Directions.” *World Archaeology* 35, no. 2, Archaeology of Epidemic and Infectious Disease (Oct. 2003): 241-257.

Raoult, Didier, Gérard Aboudharam, Eric Crubézy, Georges Larrouy, Bertrand Ludes, and Michel Drancourt. “Molecular Identification by “Suicide PCR” of *Yesinia pestis* as the Agent of Medieval Black Death.” *Proceedings of the National Academy of Sciences of the United States of America* 97, no. 23 (November 7, 2000): 12800-12803.

Robo, Etienne. “The Black Death in the Hundred of Farnham.” *English Historical Review* (1929): 560-572.

Salway, P., and W. Dell. “Plague at Athens.” *Greece & Rome*, Second Series, 2, no. 2 (June 1955): 62-70.

Schroeder, Albert H. “Shifting for survival in the Spanish Southwest.” *New Mexico Historical Review* 43, no. 4 (1968): 291-310.

Sekaquaptewa, Emory, and Dorothy Washburn. “They Go along Singing: Reconstructing the Hopi past from Ritual Metaphors in Song and Image.” *American Antiquity* 69, no. 3 (July 2004): 457-486.

Shchelkunov, Sergei N., Alexei V. Totmenin, Vladimir N. Loparev, Pavel F. Safronov, Valery V. Gutorov, Vladimir E. Chizhikov, Janice C. Knight, Joseph M. Parsons, Robert F. Massung, and Joseph J. Esposito. “Alastrim smallpox *Variola minor* virus genome DNA sequences.” *Virology* 266, no. 2 (2000): 361-386.

Smoller, Laura A. “Earthquakes, Frogs, Snakes, and Storms as Part of a Natural Explanation of Plague.” In *Last Things: Death and the Apocalypse in the Middle Ages*, edited by Caroline Walker Bynum and Paul Freedman, 172-187. University of Pennsylvania Press, 2000.

Stahle, David W., Edward R. Cook, Malcolm K. Cleaveland, Matthew D. Therrell, David M. Meko, Henri D. Grissino-Mayer, Emma Watson, and Brian H. Luckman. “Tree-ring data document 16th century megadrought over North America.” *EOS, Transactions American Geophysical Union* 81, no. 12 (2000): 121-125.

Stodder, Ann L. W., and Debra L. Martin. “Health and Disease in the Southwest Before and After Spanish Contact.” In *Disease and Demography in the Americas*, edited by John W. Verano and Douglas H. Ubelaker, 55-74. Washington D.C.: Smithsonian Institution Press, 1992.

Stone, D. J. “The Consumption of Field Crops in Late Medieval England.” In *Food in Medieval England: Diet and Nutrition*, edited by C. M. Woolgar, D. Serjeantson, and T. Waldron. 11-26. Oxford: Oxford University Press, 2006.

Talayesva, Don C., and Leo W. Simmons. *Sun Chief; The Autobiography of a Hopi Indian*. New Haven: Published for the Institute of Human Relations by Yale University Press, 1942.

Trennert, Robert A. “White Man’s Medicine vs. Hopi Tradition: The Smallpox Epidemic of 1899.” *The Journal of Arizona History* (1992): 349-366.

Torroni, Antonio, Theodore G. Schurr, Chi-Chuan Yang, Emoke J. Szathmary, Robert C. Williams, Moses S. Schanfield, Gary A. Troup, William C. Knowler, Dale N. Lawrence, and Kenneth M. Weiss. “Native American mitochondrial DNA analysis indicates that the Amerind and the Nadene populations were founded by two independent migrations.” *Genetics* 130, no. 1 (1992): 153-162.

Ubelaker, Douglas. “North American Indian Population Size: Changing Perspectives.” In *Disease and Demography in the Americas*, edited by John W. Verano and Douglas H. Ubelaker, 169-176. Washington D.C.: Smithsonian Institution Press, 1992.

Upham, Steadman. “Population and Spanish Contact in the Southwest.” In *Disease and Demography in the Americas*, edited by John W. Verano and Douglas H. Ubelaker, 223-236. Washington D.C.: Smithsonian Institution Press, 1992.

Upham, Steadman. “Smallpox and Climate in the American Southwest.” *American Anthropologist* 88, no. 1 (March 1986): 115-128.

Wall, Dennis and Virgil Masayesva. “People of the Corn: Teachings in Hopi Traditional Agriculture, Spirituality, and Sustainability.” *American Indian Quarterly* 28, no. 3/4, Special Issue: The Recovery of Indigenous Knowledge (Summer - Autumn, 2004): 435-453.

Wang, Sijia, Cecil M. Lewis Jr, Mattias Jakobsson, Sohini Ramachandran, Nicolas Ray, Gabriel Bedoya, Winston Rojas et al. “Genetic variation and population structure in Native Americans.” *PLoS Genetics* 3, no. 11 (2007): 2049-2067.

Wheelis, Mark. “Biological warfare at the 1346 siege of Caffa.” *Emerging Infectious Diseases* 8, no. 9 (2002): 971-975.

Whiteley, Peter M. *The Orayvi Split: A Hopi Transformation*. Volume 87. American Museum of Natural History, 2008.

Whiting, Alfred F. “Leaves from a Hopi doctor’s casebook.” *Bulletin of the New York Academy of Medicine* 47, no. 2 (1971): 125-146.

Winslow, C.-E. A, and M. L. Duran-Reynals. “Jacme d’Agramont and the First of the Plague Tractates.” *Bulletin of the History of Medicine* 22 (1948): 747-765.

Dissertations and Theses

Ishii, Lomayumtewa C. “Voices from Our Ancestors: Hopi Resistance to Scientific Historicide.” PhD dissertation, Northern Arizona University, 2001.

DesOrmeaux, Anna L. “The Black Death and Its Effect on Fourteenth- and Fifteenth-Century Art.” Master’s thesis, Louisiana State University, 2007.

Reff, Daniel T. “The Demographic and Cultural Consequences of Old World Disease in the Greater Southwest, 1520-1660.” PhD dissertation, University of Oklahoma, 1985.

Silverman, Sarah K. “The 1363 English Sumptuary Law: A comparison with Fabric Prices of the Late Fourteenth-Century.” PhD dissertation, Ohio State University, 2011.

Vanneste, Sarah Frances. “The Black Death and the Future of Medicine.” Master’s thesis, Wayne State University, 2010.

Online Sources

Harvard School of Public Health. “Protein: Moving Closer to Center Stage.” The Nutrition Source. Accessed December 30, 2013. http://www.hsph.harvard.edu/nutritionsource/protein-full-story/.

Sterner, Carl S. “A Brief History of Miasmic Theory.” 2007. Accessed June 25, 2103. http://www.carlsterner.com/research/2007_a_brief_history_of_miasmic_theory.shtml.