



SCHOOL of  
GRADUATE STUDIES  
EAST TENNESSEE STATE UNIVERSITY

East Tennessee State University  
**Digital Commons @ East  
Tennessee State University**

---

Electronic Theses and Dissertations

Student Works

---

5-2012

# The Invisible Enemy: The Effects of Polio on the American War Effort during World War II, 1941-1945

Jacob Owen Bryant  
*East Tennessee State University*

Follow this and additional works at: <https://dc.etsu.edu/etd>



Part of the [Military History Commons](#)

---

## Recommended Citation

Bryant, Jacob Owen, "The Invisible Enemy: The Effects of Polio on the American War Effort during World War II, 1941-1945" (2012). *Electronic Theses and Dissertations*. Paper 1404. <https://dc.etsu.edu/etd/1404>

This Thesis - Open Access is brought to you for free and open access by the Student Works at Digital Commons @ East Tennessee State University. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of Digital Commons @ East Tennessee State University. For more information, please contact [digilib@etsu.edu](mailto:digilib@etsu.edu).

The Invisible Enemy: The Effects of Polio on the American War Effort during World War II,

1941-1945

---

A thesis

presented to

the faculty of the Department of History

East Tennessee State University

in partial fulfillment

of the requirements for the degree

Master of Arts in History

---

by

Jacob Owen Bryant

May 2012

---

Dr. Stephen Fritz, Chair

Dr. Emmett Essin

Dr. Henry Antkiewicz

Keywords: Poliomyelitis, World War II, National Foundation for Infantile Paralysis, Military

Medicine, Infectious Disease

## ABSTRACT

The Invisible Enemy: The Effects of Polio on the American War Effort during World War II,  
1941-1945

by

Jacob Owen Bryant

This thesis looks at the social, political, and military effects of epidemic polio on America's war effort during World War II. The primary sources consulted include newspapers, military medical reports, photographs, memoirs, speeches, and archival collections. It looks at the effects of polio on the home front, more specifically how epidemics and the rising rates of polio were a detriment to the civilian war effort. It also focuses on the American military's preparation for and response to polio outbreaks among troops both at home and abroad. Finally, it discusses the experiences of the servicemen who contracted polio during the war. This work fills a major hole in the historiography of the disease and highlights the overlapping interests of the public, the medical community, and the military during a time of war.

## DEDICATION

This thesis is dedicated to both of my grandfathers, William Allen Bryant Jr. and John Ambrose Cox. Both of these men put their lives on hold to fight for the United States during World War II, one as a member of an anti-aircraft battery in Europe, the other as a ball-turret gunner in the Pacific. The war changed both of their lives and while my thesis only tells the story of one, they were both major influences in the choice of my career as well as my area of interest.

## ACKNOWLEDGEMENTS

This thesis would not have been possible without the assistance of a number of individuals who offered me support, gave me input, and helped edit each draft. In particular, several members of the faculty and staff of the History Department at East Tennessee State University played key roles in the conception, formulation, and ultimately creation of this project. Dr. Dorothy Drinkard-Hawkshawe was the first individual to give me the courage to pursue the theme of polio in the military when I was unsure that I would be able to find enough sources in the short time allotted.

Dr. Melvin Page took over from there, teaching me about the initial steps that are required to get such a project off the ground. Dr. Page also reviewed, commented upon, and edited the first drafts of my bibliography and what would become my introduction. Finally, Dr. Page went out of his way to ensure that I was considering specific aspects of the disease poliomyelitis such as Post-Polio Syndrome.

Certainly I would not have been able to complete this project without the help of my thesis committee. The chair of this committee, Dr. Stephen Fritz worked with me every step of the way to build this finished process. He offered guidance when I was unsure of how to proceed; helped build the framework that guided my research and ultimately the finished project; and edited each chapter thoroughly and returned them so quickly that I was never completely sure where he found the time. Dr. Fritz also allowed me to focus one of my seminar research projects on a comparative study of the American and German medical corps during World War II, which allowed me to build a foundation of knowledge on the medicine of this period that proved vital to this project.

Dr. Emmett Essin also played a major role in this project. During my first year here at ETSU, Dr. Essin allowed me to explore Franklin Roosevelt, polio, and other related topics in both his seminar on FDR and his seminar on the 1950s. Dr. Essin also facilitated the presentation of a portion of my research at the Biennial National Convention of Phi Alpha Theta in Orlando, Florida, where he was on hand to provide me with guidance and support. Finally, Dr. Essin reviewed the final copy of this thesis.

The final member of my thesis committee, Dr. Henry Antkiewicz, allowed me to write a seminar paper on the China-Burma-India Theater which helped build the foundation of several aspects of this thesis. He also edited the final product, providing me with valuable criticism.

Conducting the research for my thesis would certainly have been more difficult had it not been for the generosity of the History Department here at ETSU and its Chair Dale Schmitt. The department provided me with a generous research travel grant that allowed me to conduct a week's worth of research at the National Archives and Records Administration's Southwest Regional Archive in Fort Worth, Texas, an opportunity that would have never been possible otherwise. Furthermore, the Department was generous enough to provide me with another travel grant to attend the Phi Alpha Theta Conference in Orlando, where I was able to get valuable feedback on an aspect of my research.

None of this would have been possible without the hard work of the History Department's Executive Aide Sharon Chandler, who does so much for us Graduate Students. From completing the paperwork for and processing grants, to countless other tasks, Ms. Chandler certainly improves the lives of the History Department's graduate students.

I would also like to acknowledge Dr. Kristen L. Lawson of Pittsburg State University who reviewed my conference paper for the Phi Alpha Theta Conference in Orlando and offered me valuable feedback and vital context for my topic.

I am not sure that I would have been able to survive this process without my fellow graduate students. While this is certainly a competitive environment, we have worked hard to stick together. Through much needed distractions and empathizing with what each one of us was going through I believe we have collectively made ourselves stronger.

This project required a significant amount of primary research, and this process has been made easier by a number of individuals. First, the staff of the Legislative section at the National Archives in Washington, DC was extremely helpful in guiding me to valuable congressional records that related to my topic. The staff at the National Archives in College Park, Maryland was also helpful in allowing me to look at several of their military records collections. Finally, the staff at the NARA Southwest branch in Fort Worth was extremely friendly and helpful in finding the records of the Army and Navy General Hospital.

I would also have been unable to complete this project without the help and support of my family. My aunt and uncle, Lisa and Greg Bryant, allowed me to access my grandfather's military records. Likewise, my uncle, Richard Bryant, provided me with my grandfather's scrapbook, which made much of this project possible.

My parents, Allen and Vicki Bryant, also played a major role in this project. Not only did they support me, both morally and financially (when needed) throughout the entire process, but they also allowed me to bounce ideas off of them. Furthermore, since I was too young for my memory to be completely reliable, my father also served as my fact-checker on the story of my grandfather.

I could not have accomplished this without the support of my brother and sister-in-law, Andrew and Courtney Bryant, or my sister and her fiancé, Jenny Bryant and Jordan Sangid. Through their support and our intellectual sibling rivalry I have been pushed to get the most out of my academic opportunities in Graduate School.

Finally, none of this would have been possible without my fiancée Eliza Shelton. She has been unparalleled in her support and encouragement. Furthermore, I believe she should be given an award for putting up with me throughout this entire process. She has had to endure my unflinching focus on this project, our lack of any real summer vacation, long days devoted to nothing but research and writing, and finally my inability to converse about any other topic. She has heard every sentence in this thesis verbalized in some form or another too many times to count.

Eliza is also my editor, especially when it comes to punctuation and specifically my penchant for the overuse of semi-colons. She has been my librarian; often acquiring books for me that she thought might be of some use. She has also been my research assistant, helping me scour collections at the National Archives in Washington, DC. Finally she is my motivation and my focus, without her I probably would have expended my energies elsewhere and burned out long ago.

## CONTENTS

	Page
ABSTRACT .....	2
DEDICATION .....	3
ACKNOWLEDGMENTS .....	4
Chapter	
1. INTRODUCTION .....	9
2. THE HOME FRONT .....	25
3. THE SERVICES .....	71
4. THE MEN .....	104
5. CONCLUSION .....	138
BIBLIOGRAPHY .....	142
VITA.....	154

## CHAPTER 1

### INTRODUCTION

In October 1944, William Allen Bryant Jr., a Corporal in the 226<sup>th</sup> Antiaircraft Artillery (AAA) Battalion, began to notice a gradual loss of feeling in his legs.<sup>1</sup> At first this occurrence did not concern him, and he explained it away as a result of spending such a long period of time dug into the damp French soil. The fatigue that accompanied the numbing sensation had an even less complicated explanation; Corporal Bryant had just gotten back to the front line following a lengthy trip to Paris on a liberty pass.<sup>2</sup>

While a liberty pass allowed a soldier a certain amount of rest, it also held its own ability to exhaust, one that is familiar to anyone who has experienced the hectic pace of a short vacation in a new city. Bryant's trip to Paris had been no different. He had taken advantage of every opportunity to have fun, taking time to visit all the famous Parisian sites and even joining several of his buddies for a swim in the Seine. However, all good things must come to an end, and Corporal Bryant found himself back with his antiaircraft battery experiencing odd sensations in his lower extremities.

What Bryant did not know was that he would be back in the city limits of Paris before the month was out. This trip would not be quite as pleasurable as the first. As the numbness got worse, it was accompanied by a weakness in his muscles that made it impossible to move his legs and eventually by excruciating pain. These symptoms likely prompted an appearance at sick call or perhaps a call to a medic. Whatever the case, Bryant found himself transported to the

---

<sup>1</sup> Battery C, 796<sup>th</sup> AAA AW Bn. Thanksgiving 1943 Bulletin, Documents of William Allen Bryant Jr., Original in possession of Author.

<sup>2</sup> Pass to Paris 20 September 1944; William Allen Bryant Jr., Postcard from Paris to Mrs. William Allen Bryant, October 1, 1944, Documents of William Allen Bryant Jr., Original in possession of Author.

203<sup>rd</sup> General Hospital in Paris.<sup>3</sup> While there, Army medical personnel examined him and made the difficult diagnosis. Corporal Bryant had polio.

Bryant's diagnosis was not an anomaly in the American military during World War II; he shared it with hundreds of other servicemen. Yet this aspect of polio has largely been ignored by scholars. In fact, the experience of polio during the war years is noticeably absent in much of the literature on the disease.

The historiography of polio has evolved dramatically over the course of the last half century. The literature started with discussions of the scientific community's attempt to conquer the disease but over the last few decades has begun to be much more victim-focused. Modern scholarship is primarily concerned with the effect that polio, as an epidemic disease, had on American society, American culture, and the lives of Americans throughout the first half of the twentieth century. Historian David Oshinsky writes that polio "has become a lens through which to study the culture of the mid-twentieth century United States."<sup>4</sup>

The early historiography of polio can be characterized as works that illustrate the vast influence and funding of Basil O'Connor and his National Foundation for Infantile Paralysis (NFIP). The authors of these works, Roland Berg, Turnley Walker, Victor Cohn, and Alton L. Blakeslee, all received research grants from the NFIP, and the influence these had on their findings is hardly concealed.<sup>5</sup>

This literature tends to give a very cursory history of polio in America while focusing on the experience of Franklin Delano Roosevelt, the Georgia Warm Springs Foundation, the NFIP,

---

<sup>3</sup> Documents of William Allen Bryant, Original in possession of Author.

<sup>4</sup> David M. Oshinsky, *Polio: An American Story* (Oxford: Oxford University Press, 2005), 285.

<sup>5</sup> Roland Berg, *The Challenge of Polio: The Crusade against Infantile Paralysis* (New York: Dial Press, 1946); Turnley Walker, *Roosevelt and the Fight Against Polio* (London: Rider and Company, 1954); Victor Cohn, *Four Billion Dimes* (Minneapolis: Minneapolis Star and Tribune, 1955); Alton L. Blakeslee, *Polio and the Salk Vaccine: What you Should Know About it* (New York: Grosset & Dunlap, 1956).

and its fund-raising arm the March of Dimes. Any discussion of the advances in the prevention and treatment of polio up to the date that each of these books was published is a thinly veiled attempt to show the importance of the funding provided by the Foundation to the scientific and medical communities. The goal of these authors was to convince the public to continue to donate time and effort to the cause of polio.

One of the largest portions of the polio historiography is comprised of several biographies of the disease.<sup>6</sup> The first of these biographies was written by long-time polio researcher John R. Paul.<sup>7</sup> Paul's oft-referenced tome is widely considered the preeminent work on the subject. The author discusses the subject's probable occurrence throughout antiquity, its sporadic outbreaks during the nineteenth century, and its emergence as an epidemic disease in the twentieth century. Paul uses his extensive knowledge, gained during his career as one of the major pioneers in the battle against polio, along with a large amount of research, to create this literary picture of the disease.

*A History of Poliomyelitis* also has the distinction of being one of the few works to go into detail about the effect that polio had on the military during World War II, with an entire chapter being dedicated to this subject. Paul gained the information first-hand as a member of the Neurotropic Virus Disease Commission of the Army Epidemiological Board, his work with outbreaks of polio in troops stationed overseas, and his role in the DDT trials of 1945.<sup>8</sup> The one aspect of the disease that this work fails to cover in any real depth however is the social and cultural effects of polio.

---

<sup>6</sup> The concept of the biography of a disease was established by famed bacteriologist and former Chariman of Harvard University's Department of Biology Hans Zinsser in *Rats, Lice, and History* (New York: Bantam, 1935).

<sup>7</sup> John R. Paul, *A History of Poliomyelitis* (New Haven: Yale University Press, 1971).

<sup>8</sup> Paul, *A History of Poliomyelitis*, 347-8.

The next major biography of polio was published in 2005 by Mary M. Shaffer and Bernard Seytre. *The Death of a Disease: a History of the Eradication of Poliomyelitis* builds on the foundation created by Paul some thirty years before.<sup>9</sup> As with the earlier biography, this work focuses on the scientific community's response to polio and the drive to conquer it. Shaffer and Seytre do not limit themselves to a discussion about the Salk and Sabin vaccines and how they ended the disease's reign in America. Rather, they show how global efforts at eradication have progressed over the decades since the 1950s and discuss the effort still being put forth to rid the third world of the disease today. Unlike Paul's work, this monograph does look at some of the social ramifications of polio, although this is not done in a historical sense but rather the authors show how the disease currently affects people living in areas where it is still epidemic.

Perhaps the most important modern counterpart to Paul's work is David M. Oshinsky's Pulitzer Prize winning *Polio: An American Story*. Oshinsky's work is modeled on the template established in *A History of Poliomyelitis*, but it is written in a more modern and less scientific voice. The focus of this book is the scientific and medical advances of polio throughout the first half of the twentieth century, with a focus on the two major contributors to the vaccine race, Jonas Salk and Albert Sabin. Oshinsky's monograph is certainly an important source for anyone studying the disease.

The most recent polio biography was published in 2009 by the polio victim Daniel J. Wilson. This book is a condensed version of Paul and Oshinsky's works. However, unlike these two, Wilson discusses the social ramifications of the disease while paying particular attention to the experiences of its victims. This victim-conscious approach is much in evidence in the bulk of

---

<sup>9</sup> Mary M. Shaffer, and Bernard Seytre, *The Death of a Disease: A History of the Eradication of Poliomyelitis* (New Brunswick: Rutgers University Press, 2005).

Wilson's writings on the subject. The fact that the author is a victim of the disease himself makes him a particularly knowledgeable expert on the experiences of other victims.

Scholars have also used the major actors in the advancement of the treatment or prevention of polio to help explain the effects of the disease. In these works, polio is generally viewed as the child crippling antagonist that the hero of the story sets about to conquer. One such hero was the Australian nurse Sister Elizabeth Kenny. The subjects of Elizabeth Kenny and polio in the United States go hand in hand, and it is no wonder that she is often included in the larger works on the disease. However, Kenny's role in the battle against the dreaded disease has also been the primary subject of several works.

The first of these works was a biographical sketch written by Victor Cohn in 1975.<sup>10</sup> In this book, Cohn, who through his work with the *Minneapolis Star and Tribune* was quite familiar with Sister Kenny, does his best to tell the story of her life and her famous treatment to alleviate the sufferings of polio victims while dispelling some of the falsehoods and rumors that have always shrouded the truth. Throughout this work and despite the sometimes brashness of its creator, the Kenny Method of treatment for Infantile Paralysis comes through as perhaps the most important innovation in the treatment of the victims of this disease.

Kenny was once again the subject of a scholarly work in 2008 when Naomi Rogers published her article "'Silence has its Own Stories': Elizabeth Kenny, Polio, and the Culture of Medicine."<sup>11</sup> Rogers, another famous polio historian, uses the story of Sister Kenny as a vehicle to tell the larger story of the culture of medicine that prevailed in America in the 1940s and 1950s and subsequently helped shape the fight against the disease. Both of these works are very

---

<sup>10</sup> Victor Cohn, *Sister Kenny: The Woman Who Challenged the Doctors* (Minneapolis: University of Minnesota Press, 1975).

<sup>11</sup> Naomi Rogers, "'Silence has its own Stories': Elizabeth Kenny, Polio and the Culture of Medicine," *Social History of Medicine* 21, no. 1 (April 2008): 145-61.

important in telling the story of Sister Kenny, her Kenny Method, and the effect they had on the treatment of polio during the war years, a theme that plays a major part in this thesis.

Another prominent figure in the polio historiography is the scientist and creator of the first successful polio vaccine, Jonas Salk. Like Kenny, Salk's importance to the subject is undeniable, and his story is included in much of the literature that has previously been discussed. Also like Kenny, Salk has been the focus of several literary accounts of the race to conquer the disease, much more so than his live-vaccine creating counterpart and rival Albert Sabin. These works focus on the brilliant but misunderstood virologist who successfully brought an end to epidemic polio in the United States.

Salk was first made the subject of a biography slightly more than a decade after his successful vaccine field trials. Richard Carter published *Breakthrough: the Saga of Jonas Salk* in 1966.<sup>12</sup> Compared with the works that followed it, *Breakthrough* is much more concerned with the life of the man itself. However, this work also attempts to shed some light on the disease through the prism that was the scientist's life. This method of describing the disease through the experiences of its conqueror would be adopted and expanded by subsequent authors.

The next author to take up this theme was Jane S. Smith who, in 1990, published *Patenting the Sun: Polio and the Salk Vaccine*.<sup>13</sup> Smith, even more so than Carter, attempts to explain polio in early twentieth century America by telling the story of Jonas Salk. *Patenting the Sun's* discussion of polio includes a much broader range of information and interpretation regarding the effects of the disease on American society than does *Breakthrough*, but it is clear that Carter's work was a major influence on Smith.

---

<sup>12</sup> Richard Carter, *Breakthrough: the Saga of Jonas Salk* (New York: Trident Press, 1966).

<sup>13</sup> Jane S. Smith, *Patenting the Sun: Polio and the Salk Vaccine* (New York: William Morrow & Company, 1990).

The most recent work to deal with these issues was published in 2004 by Jeffrey Kluger.<sup>14</sup> Kluger's work takes the Carter method and flips it on its head. Instead of using the saga of Jonas Salk to tell the story of polio in America, the author of this work uses the story of polio in America to tell the story of Jonas Salk. The book is broken up into groups of two chapters, each covering the same time period. These chapters alternate between explaining what was happening with polio during the specific period and then discussing the experience of Salk during the same period. The Salk literature has very little to do with the experience of polio during World War II, but it is interesting to note the role that the war and Salk's experiences in it played in the scientist's familiarity with vaccination and his subsequent creation of the polio vaccine.

In the past two decades, historians have become much more interested in researching the social history of polio. This literature is focused on the way polio shaped American culture, the experiences of the disease's victims, and in using these experiences to explain manifestations of other larger social phenomena. The first of these victim centered monographs was published by Tony Gould in 1995. *A Summer Plague: Polio and Its Survivors* successfully takes the template that Paul created in the 1970s and incorporates the stories of the disease's victims.<sup>15</sup>

Gould laments that "journalists and historians have inevitably focused on the scientific and political story of the developments of the polio vaccines because that is such a dramatic story. But in the process the experience of the polio patient, the actual sufferer, gets lost."<sup>16</sup> After acknowledging this hole in the historiography, the author sets about filling it in. What results is the first in an ever expanding line of victim focused histories.

---

<sup>14</sup> Jeffrey Kluger, *Splendid Solution: Jonas Salk and the Conquest of Polio* (New York: G.P. Putnam's Sons, 2004).

<sup>15</sup> Tony Gould, *A Summer Plague: Polio and Its Survivors* (New Haven: Yale University Press, 1995).

<sup>16</sup> Gould, xiii.

Katherine Black followed Gould's lead in 1996 when she published *In the Shadows of Polio: A Personal and Social History*.<sup>17</sup> Black wrote this work in an attempt to come to terms with the death of her mother from complications of polio during the early 1950s. In doing so, the author lives up to her title and tells a story that has more of a social focus than any prior study of the disease. Black's poignant account also includes the story of her mother's bout with polio and the effects it had on the family as a whole.

It is in this category that we find two more works written by Daniel J. Wilson. The first of these is a monograph published in 2005, titled *Living with Polio: The Epidemic and its Survivors*.<sup>18</sup> This work, continuing with the trend established by Gould and Black, was the first book-length work that was entirely focused on the experiences of the victims. Wilson argues that "children, adolescents, and adults whose bodies were paralyzed by the virus [...] slowly, painfully, and determinedly rebuilt lives shattered by polio."<sup>19</sup> In compiling research for this book, the author leans on a number of sources, but most significantly he looks at 150 different polio narratives. The end Wilson achieves with this work is to formulate perhaps the most important social history of polio victims to date.

The second of Wilson's publications to be included in this category was his article "Psychological Trauma and its Treatment in the Polio Epidemics."<sup>20</sup> As the title suggests, this work focuses on the effect that psychological issues had on the victims of the disease. Wilson is particularly interested in the dichotomy between patients who were treated for the disease prior to the mid-1940s, when these psychological issues were largely ignored, and patients who were

---

<sup>17</sup> Katheryn Black, *In the Shadow of Polio: A Personal and Social History* (Reading, MA: Addison-Wesley, 1996).

<sup>18</sup> Daniel J. Wilson, *Living with Polio: The Epidemic and its Survivors* (Chicago: University of Chicago Press, 2005),

<sup>19</sup> Wilson, *Living with Polio*, 10.

<sup>20</sup> Daniel J. Wilson, "Psychological Trauma and its Treatment in the Polio Epidemics," *Bulletin of the History of Medicine* 82, no. 4 (Winter 2008): 848-77.

treated after the mid-1940s, when these issues were better understood. Although most of this victim focused literature pays little attention to the war years and does not broach the subject of servicemen with polio, it is invaluable in the parallels it allows one to draw between the experiences of different groups of polio victims.

Naomi Rogers has taken this approach to the study of polio one step further and began to use the disease as a way to analyze social issues during the first half of the twentieth century. In two recent articles, Rogers has analyzed the role that race and disability politics played in the public response to the disease, specifically how each of these was approached by FDR, Basil O'Connor, and the National Foundation for Infantile Paralysis.<sup>21</sup> In these articles, Rogers argues that on both issues, Roosevelt and the foundation kowtowed to political pressure to maintain the status quo, despite token concessions that suggest otherwise. These articles also hint at the evolving view that scholars are taking towards the role that FDR played in the experiences of polio victims.

In recent years, Franklin Roosevelt, the most famous American polio survivor and longest tenured President in the history of the United States, has become the subject of a new technique to study polio. This method ignores the role he played in founding the Georgia Warm Springs Foundation and the National Foundation for Infantile Paralysis. Instead, this literature challenges the prevailing view of FDR as an unquestioned inspirational hero to all those who battled the debilitating disease. These scholars have determined that in this regard, Roosevelt's role in polio victims' lives was distinctly more ambiguous than previously thought.

The first scholar to analyze this aspect of the polio experience was Daniel J. Wilson. In his 1998 article "A Crippling Fear: Experiencing Polio in the Era of FDR," Wilson calls

---

<sup>21</sup> Naomi Rogers, "Race and the Politics of Polio: Warm Springs, Tuskegee, and the March of Dimes," *American Journal of Public Health* 97, no. 5 (May 2007): 784-95; Naomi Rogers, "Polio Chronicles: Warm Springs and Disability Politics in the 1930s." *Asclepio* 61 (June 2009): 143-74.

Roosevelt an “ironic model for the polio survivor.”<sup>22</sup> For this article, the author analyzed the letters that polio victims mailed to the President. Wilson states that these letters are often pleas to the President for guidance in battling the disease. He also argues that because Roosevelt took such pains to hide the full extent of his disability and his penchant for propagating the veneer that he had conquered the disease, the President gave false hope to many polio victims who believed they too could fight their way back to full health.

These victims’ reaction to the later realization of the fact that they had been duped by their unquestioned leader is the subject of a similar article. “The Polio Narratives: Dialogues with FDR,” was published by Amy L. Fairchild in 2001 and it also deals with Roosevelt’s role in the lives of polio victims.<sup>23</sup> Like Wilson, Fairchild analyzes this role from the perspective of the polio survivor, but instead of looking at their letters, she analyzes published polio narratives. What the author finds is that the early narratives include positive images of FDR because, at the time of writing, the authors still viewed Roosevelt as a source of inspiration. Fairchild argues that in the narratives that are published later, the authors have come to grips with the fact that they will never live normal lives and their bitterness towards the false hope provided to them by the public image of the ex-president is palpable.

Another emerging historical interpretation of polio is for scholars to look at the impact that the disease had on American health care. This is the basis behind Donald Neumann’s 2004 article “Polio: Its Impact on the People of the United States and the Emerging Profession of Physical Therapy.”<sup>24</sup> Neumann argues that the medical community’s experiences with treating

---

<sup>22</sup> Daniel J. Wilson, “A Crippling Fear: Experiencing Polio in the Era of FDR,” *Bulletin of the History of Medicine* 72 (1998): 464, Project Muse.

<sup>23</sup> Amy L. Fairchild, “The Polio Narratives: Dialogues with FDR,” *Bulletin of the History of Medicine* 75, no. 3 (Fall 2001): 488-534, Project Muse.

<sup>24</sup> Donald Neumann, “Polio: Its Impact on the People of the United States and the Emerging Profession of Physical Therapy,” *Journal of Orthopedic and Sports Physical Therapy* 34, no. 8 (2004): 479-92.

polio in the 1940s and 1950s helped establish physical therapy as a legitimate aspect of medicine and the treatment of disabled individuals. This argument is the only one of its kind, but it seems to highlight an interesting hole in the historiography, one that, if explored further, could certainly add an important aspect to our understanding of the disease.

Author Marc Shell has taken his own unique view of polio in his 2005 book *Polio and Its Aftermath: The Paralysis of Culture*.<sup>25</sup> Shell uses this work to analyze multiple references, both open and veiled, to the disease in many of the cultural items that were produced during the polio years. Despite the title of the book, the author does not discuss any detrimental effects that the disease may have had on American culture during this period. Shell's contribution to the polio historiography is certainly an interesting one, and it highlights aspects of the disease that have never, prior to or hence, been studied.

The final category that is evident in the historiography of polio is that of literature dealing with specific epidemics. This type of literature is another recent development, coming about in just the last couple of decades, with the advent of micro-histories and community studies. However, it has expanded in popularity to the point that it is now the most frequent method adopted by authors to discuss the disease.

The first of these case studies was published in 1996 by Naomi Rogers. Despite its title, *Dirt and Disease: Polio Before FDR* is primarily centered around the New York epidemic of 1916. In particular, Rogers uses the epidemic as a case study to illustrate the dynamics between the public, the medical community, and epidemic disease. The author argues that measures put in place during the outbreak reflected less on the understanding of disease in general and polio in

---

<sup>25</sup> Marc Shell, *Polio and Its Aftermath: The Paralysis of Culture* (Cambridge: Harvard University Press, 2005).

particular than they were reflections of the prevailing social attitudes that viewed the poor and immigrants with scorn.

Two years after Rogers's work was published, Alice Sink published a monograph titled, *The Grit Behind the Miracle: A True Story of the Determination and Hard Work Behind an Emergency Infantile Paralysis Hospital, 1944-1945, Hickory, North Carolina*.<sup>26</sup> Sink's publication tells the story of one of the unique experiences of the polio years, the construction of a temporary emergency hospital in North Carolina. However, the light it shines on the response to an epidemic in the middle of World War II is invaluable to this thesis. It is also the only scholarly monograph that is completely dedicated to polio during the war years.

Following in the footsteps of these first publications is Michael W. R. Davis's article "Kentucky's 1944 Polio Epidemic."<sup>27</sup> Like Sink's monograph, this article is important in understanding the dynamics of polio and the war effort during World War II. While Davis does not address this issue head on, he does discuss a number of issues from which parallels can be drawn.

Volney Steele adopted this method of an epidemic case study and used it to great effect in his 2005 article "Fear in the time of Infantile Paralysis: The Montana Experience."<sup>28</sup> Much like Roger's work, Steele's focuses on the earlier polio years, primarily discussing the experience of polio in Montana during the 1920s. The value of this article lies in its description of the disease in a sparsely populated western state at a time when the major epidemics were occurring in the east.

---

<sup>26</sup> Alice E. Sink, *The Grit Behind the Miracle: A True Story of the Determination and Hard Work Behind an Emergency Infantile Paralysis Hospital, 1944-45, Hickory, North Carolina* (Lanham: University Press of America, 1998).

<sup>27</sup> Michael W. R. Davis, "Kentucky's 1944 Polio Epidemic," *Filson Club History Quarterly* 74, (2000): 353-66.

<sup>28</sup> Volney Steele, "Fear in the Time of Infantile Paralysis: The Montana Experience," *Montana: The Magazine of Western History* 55, no. 2 (Summer 2005): 64-74, JSTOR.

The most recent polio case study was published in 2009 by Heather Green Wooten.<sup>29</sup> Wooten's monograph discusses the experience of polio in Texas and unlike Steele's work on Montana, covers the disease during the decades that the threat of polio was most acute, the 1940s and 1950s. Unlike most of the authors of these previous case studies, Wooten directly addresses the issue of polio during World War II. Because of this fact, her study is valuable not just for its ability to shed light on the experiences of the state of Texas with the disease during the war, but also for giving a brief description of how the entrance of the United States into the Second World War affected the battle against polio.

Despite many of these sources briefly covering some aspect of polio during World War II, the subject has yet to be looked at in any real depth. For example, outside of Paul's very scientific chapter on polio as a military disease during World War II, we have no secondary work describing the American military's experience with this dreaded disease. Also, despite the voluminous social histories of polio, there has been no scholarly publication that has looked at the experiences of servicemen who contracted the disease. The only authority we have on this subject is a recent popular work by Timothy James Bazzett.

*Love, War & Polio: The Life and Times of Young Bill Porteous* is the best secondary source for gaining an understanding of the lives of American soldiers who contracted polio during World War II.<sup>30</sup> Written as a biography of Bill Porteous, an officer in the US Army who contracted polio around the time of V-J day, this work does an excellent job of laying out the experience of the serviceman, the effect the disease had on his life, and a bottom-up look at the Army's response to the disease. Bazzett constructed this narrative with the assistance of a

---

<sup>29</sup> Heather Green Wooten, *The Polio Years in Texas: Battling a Terrifying Unknown* (College Station: Texas A&M University Press, 2009).

<sup>30</sup> Timothy James Bazzett, *Love, War & Polio: the Life and Times of Young Bill Porteous* (Reed City, MI: Rathole Books, 2007).

collection of Porteous's letters and several face-to-face interviews. What results is perhaps the most important work in the historiography of polio during World War II to date.

After surveying this literature, it becomes clear that there is a fairly large hole in the historiography. Very little attention in general has been paid to polio during World War II, let alone the effects it had on the war effort, both at home and abroad. With this in mind, it is the goal of this thesis to fill in this gap while detailing and connecting the major polio advances of the 1940s that have been discussed by other scholars.

To fill in the gap created by the paucity of secondary works, this thesis depends on a number of primary sources. In order to gauge polio on the home-front during the war I looked at several contemporary newspapers representing different parts of the country.<sup>31</sup> To analyze the military's experience with polio I looked at World War II American Naval casualty records, records from the Army and Navy General Hospital in Hot Springs Arkansas (ANGH), as well as the official military medical histories<sup>32</sup> and medical statistics. Finally, in an attempt to gain perspective on the lives of servicemen who contracted polio during the war, I had the distinct benefit of having access to an unpublished scrapbook of William Allen Bryant Jr.'s experience in the Army and from his time at ANGH. This scrapbook includes photographs, news clippings, and a variety of miscellanea that provide small glimpses into Bryant's experience.

Despite this subject's absence from the historiography, it is one that is certainly worth exploring. By analyzing the effect that polio had on the American war effort during World War II, we can begin to understand important relationships between American society, the military, and epidemic disease. In particular, we see how the first two related to each other and how they

---

<sup>31</sup> *The Atlanta Constitution, New York Times, Wall Street Journal, The Los Angeles Times, The Chicago Daily Tribune, and The Washington Post.*

<sup>32</sup> These "histories" are more often than not collections of essays written by scientists and medical authorities that served the military in an official capacity and thus dealt with these issues first hand.

both dealt with the third. Finally, this subject provides the opportunity to analyze how adults dealt with contracting a disease that, at the time, was popularly viewed as a child's illness.

Polio had a major impact on America's war effort during World War II, both on the home front and in the various theaters of the war. The war years saw an ever increasing number of civilian cases of polio, with the 1944 numbers being the highest since the 1916 epidemic. The rising rates of polio supplemented by the fear campaign instituted by the NFIP created the widespread terror that would typify the public's response to the disease for the next fifteen years. World War II also saw the average age of polio victims increase, with the number of adult cases swelling to never before seen proportions. This phenomenon endangered war workers at home as well as GIs serving both at home and abroad.

With the rising rates of polio came larger and more frequent epidemics. With the increased military needs for medical personnel, these epidemics taxed already overstretched medical resources. As a response to civilian medical needs the military was often called in to help set up temporary medical buildings; Army medical personnel were used to treat civilian polio victims; and military funds were occasionally provided to help in battling the epidemics. Military representatives often worked side by side with the Foundation in assessing the needs of a community in the time of an outbreak of polio.

The military also had to address the unexpected cases of polio within its own ranks. The rates of polio in the military paralleled those on the home-front, with the increases coming near the end of the war. In fact, the worst epidemic in the American military occurred on the Philippine Islands, with cases starting in November 1944 and increasing well into the last year of the war. Poliomyelitis became a very serious issue for the military because of its ability to

cripple or kill a soldier as effectively as any bullet and the long expensive rehabilitation that was required before a soldier could be discharged on disability.

The lives of these servicemen who contracted polio during the war were forever changed. From the onset of illness, these individuals faced a struggle for their survival and their livelihood. The ones who were lucky enough not to have to fight for their very existence in an Iron Lung had to undergo a long and arduous process just to realize that they were unlikely to ever again walk without the aid of appliances. These men and women also had to face the challenge of coping with the fact that they were disabled in the line of duty, not through combat with a mortal foe but rather through combat with a microbe.

## CHAPTER 2

### THE HOME FRONT

In the summer of 1944 as the Allied Expeditionary Force stormed the beaches of Normandy and while Corporal William Bryant was still in transit to the Eastern Theater of Operations, an insidious enemy came out of its hiding place in the mountains of North Carolina. This foe killed or permanently disabled hundreds of local individuals without respect to age or gender. These victims were reported in local and national newspapers alongside the most recent war casualties. Eventually local authorities, at the end of their rope, were forced to appeal to the military for assistance in the ensuing battle. This incident was not the result of some Nazi fifth column group or a continental Pearl Harbor, but to the victims, it was just as terrible. As Bryant would soon face, these individuals were in a life and death struggle with the dreaded poliovirus.

The 1944 North Carolina polio epidemic was just one of many such epidemics during the years that America was engaged in World War II. The 1940s witnessed the number of polio cases grow at an ever increasing pace while the disease evolved to become one of the most fearsome known to Americans. Much of the fear generated by the polio outbreak can be blamed on the scare tactics used by the National Foundation for Infantile Paralysis in a misguided attempt to drum up support for its cause but also reflects the growing incidence rates of polio. Furthermore, the scientific and medical communities, let alone the lay public, were still ignorant about the cause, spread, and treatment of poliomyelitis itself, a fact that only increased the anxiety associated with this malady. One thing is certain, “with each advancing year, the disease

encroached further and further into the U.S. consciousness as it increasingly threatened the well-being of millions of children and young adults.”<sup>33</sup>

The growing frequency of poliomyelitis and the increasing public fear of the disease became a major aspect of the World War II years inside the United States. The higher incidence rates of polio posed a threat to both the families of GIs as well as those of the war workers so important to American industrial production. Furthermore, the growing number of victims taxed a health care system that was already facing shortages of supplies and personnel because of the needs of the military. Meanwhile, the NFIP in an attempt to help alleviate these problems, assist the scientific community’s efforts at studying the disease, and navigate the complicated arena of wartime fund-raising, had to alter its tactics and subsequently its relationship to and image with the American public. Polio had a major impact on the American home-front during World War II.

Poliomyelitis or as it is more commonly called, polio, is an enteric disease, with the virus multiplying in the intestines of its host. It is generally spread from person to person, most frequently through contact with infected fecal material. After contact, the virus enters the victim through the mouth, makes its way to the tonsils or further down the digestive system, and eventually into the blood stream. Once the virus establishes itself in the intestines, the victim, although perhaps having none of the tell-tale symptoms, becomes a carrier and can spread the disease to others.<sup>34</sup>

Polio was also one of the most unpredictable of diseases. At its height as an epidemic disease, it had the ability to infect anyone anywhere without prior warning. Symptoms of an

---

<sup>33</sup> Heather Green Wooten, *The Polio Years in Texas: Battling a Terrifying Unknown* (College Station: Texas A&M University Press, 2009), 57.

<sup>34</sup> David M. Oshinsky, *Polio: An American Story* (Oxford: Oxford University Press, 2005), 8-9; Harold K. Faber *The Pathogenesis of Poliomyelitis* (Springfield: Charles C. Thomas, 1955), 28; John R. Paul, *A History of Poliomyelitis* (New Haven: Yale University Press, 1971), 2.

infection could occur as early as two days or as late as thirty-five days post-infection, if they occurred at all. Polio had the ability to kill its victims or at least leave them with a physical disability. However, the chances of either of these outcomes were actually quite small. It is estimated that only about one percent of all polio infections caused paralysis. Out of these, less than ten percent of its victims died from the disease or complications related to it. Furthermore, in approximately half of all paralytic cases, the patient inexplicably recovered with little or no residual effects.<sup>35</sup>

Despite its low rate of occurrence, the ability of polio to paralyze its victims was by far its most fearsome trait. In fact, the disease got its name from this symptom; poliomyelitis means inflammation of the gray marrow. After multiplying in the intestines and infecting the blood stream of its victims, occasionally the virus found its way into the victim's spinal column. Once there, the poliovirus tended to attack the anterior horn cells. These cells are responsible for sending the impulses that instruct the body's skeletal muscles to contract. In cases of paralysis, the ability of these cells to accomplish this job is impaired.<sup>36</sup>

Another of the terrifying properties of the disease was its occasional infection of its victims' brain stems. More commonly referred to as bulbar polio, because of the brain stem's bulb like shape, this form of the disease often restricted the patient's ability to breathe or swallow.<sup>37</sup> More polio patients died from respiratory complications than any other symptom related to the disease.

---

<sup>35</sup> Oshinsky, 5 & 8; Volney Steele "Fear in the Time of Infantile Paralysis: the Montana Experience," *Montana: The Magazine of Western History* 55, no. 2 (Summer 2005): 65, JSTOR.

<sup>36</sup> Kathryn Black, *In the Shadow of Polio: A Personal and Social History* (Reading, MA: Addison-Wesley, 1996), 16; Oshinsky, 8-9.

<sup>37</sup> Oshinsky, 9; Timothy James Bazzett, *Love, War & Polio: the Life and Times of Young Bill Porteous* (Reed City, MI: Rathole Books, 2007), 110-1.

Perhaps the most important aspect of polio, both to its evolution as an epidemic disease and to its eventual downfall at the hands of the Salk and Sabin Vaccines of the 1950s, is its ability to confer immunity upon its victims. In even the most inapparent cases of polio, the immune system develops antibodies to the infection. These antibodies form shortly after the virus invades the bloodstream; they make short work of dispatching the virus and are carried in the host for the rest of its life.<sup>38</sup>

Unfortunately, many aspects of the disease poliomyelitis have never been uncovered. Most of what we know was discovered by scientists prior to the creation of the Salk and Sabin Vaccines. Once these vaccines accomplished their intended end, the study of polio was put on the back-burner, with several important questions remaining unanswered.<sup>39</sup> Once the threat was eliminated, the public fears abated, and the funding from the NFIP dried up, American scientists turned their attention away from the disease to other more interesting and more profitable ventures.

The disease poliomyelitis has enjoyed a very long although perhaps mostly uneventful history. Historian David Oshinsky divides this history into three major phases: the endemic period, the epidemic period, and the post-vaccine period.<sup>40</sup> The major scope of this thesis, as with almost all of the polio historiography, is focused during the middle of these epochs, polio's time as an epidemic disease. However, to understand this phase it is important to understand polio's history as an endemic disease and the shift that propelled it from the first period to the second.

---

<sup>38</sup> Oshinsky, 9 & 126-7.

<sup>39</sup> Edmund J. Sass, George Gottfried, and Anthony Sorem eds., *Polio's Legacy: An Oral History* (Lanham: University Press of America, 1996), 4.

<sup>40</sup> Oshinsky, 9.

Like most diseases, polio began as an endemic disease, occurring in man without causing any widespread epidemics.<sup>41</sup> This period was characterized by non-symptom producing infections of infants who were still under the protection of maternal antibodies laced with the occasional deformity caused by a rare malignant infection. The first and best known reference to these after-effects of a polio infection came in the form of an Egyptian mural, or stele, dating from around 1500 BC.<sup>42</sup> The stele depicts an Egyptian priest with a withered leg. The priest's symptoms were diagnosed by the Danish physician Ove Hamburger in 1911 as drop-foot having likely been caused by a poliomyelitis infection.<sup>43</sup>

Polio was referenced several other times in surviving ancient literature. "The ancient world's most renowned physicians, the Greek Hippocrates and the Roman Galen, both refer to polio-like deformities in their writings."<sup>44</sup> Hans Zinsser argues that Hippocrates may even have been the first person to record a possible case of adult-onset polio in his *Epidemion* when he describes a pregnant woman who "suffered from a sudden pain in the back, rapidly followed by fever, headache, pain in the neck and right hand" and who eventually experienced paralysis.<sup>45</sup>

Such descriptions became even more frequent in the seventeenth and eighteenth centuries. In the nineteenth century, everything changed. It was at this point that polio evolved into an epidemic disease. In this period, physicians began to notice small clusters of paralysis occurring in Europe and the United States. The medical community believed the cause of this paralysis to be a new disease. Throughout the rest of the century, this malady would be given many names: debility of the lower extremities; Heine-Medin's Disease, Infantile Paralysis; and

---

<sup>41</sup> Oshinsky, 9-10; Hans Zinsser, *Rats, Lice, and History* (New York: Bantam, 1935), 57.

<sup>42</sup> Oshinsky, 10; Black, 23; Roland Berg reports the date reports the date to be 3700 BC, *The Challenge of Polio: The Crusade Against Infantile Paralysis* (New York: Dial Press, 1946), 22.

<sup>43</sup> Paul, *A History of Poliomyelitis*, 12.

<sup>44</sup> Oshinsky, 10.

<sup>45</sup> Zinsser, 84; for discussion on other occurrences in Hippocrates' writing see Paul, *A History of Poliomyelitis*, 14-5.

morning paralysis. What scientists and medical professionals during this era failed to understand was that they were witnessing not the discovery of a new disease but instead the shifting patterns of an old one.<sup>46</sup>

In *Rats, Lice, and History*, Hans Zinsser points out that new diseases do not really exist. Instead, a “new disease” is generally just a disease in which the relationship between the parasite and its host has been altered, converting “a relatively benign infection into a highly virulent one.”<sup>47</sup> Polio certainly fits this description, but it was precisely this shifting relationship that kept the medical community from realizing it.

Public knowledge of combating infections during the late nineteenth and early twentieth century had its foundation in the concept of cleanliness. Personal hygiene and sanitation were known to reduce the chances of a bacterial infection.<sup>48</sup> The United States and other Western countries were at the vanguard of this movement. These countries also had the most frequent and severe outbreaks of polio.<sup>49</sup> How could the countries that paid so much attention to improved sanitation also witness the highest rates of this new disease? This contradiction led to much confusion over the half century that polio survived as an epidemic disease in the United States.

The answer to this enigma lay in the differences between bacteria and viruses like polio. The cleaner environments that existed in the western world, while protecting individuals from harmful bacteria, also shielded them from early infections of viruses which were necessary for building a lifelong immunity.<sup>50</sup> Therefore, “in the case of polio, [better sanitation and cleanliness] may have brought a sleeping giant to life.”<sup>51</sup>

---

<sup>46</sup> Paul, *A History of Poliomyelitis*, 5; Oshinsky, 8 & 10.

<sup>47</sup> Zinsser, 55.

<sup>48</sup> Greer Williams, *Virus Hunters* (London: Hutchinson, 1960), xv.

<sup>49</sup> Oshinsky, 4.

<sup>50</sup> Oshinsky, 31.

<sup>51</sup> Oshinsky, 28.

The first major epidemics occurred outside of the United States. Scandinavia suffered the bulk of these in the nineteenth century. John R. Paul argues that this was probably caused by the area's sparse population and its relative isolation, leaving its inhabitants less likely to encounter the disease in infancy.<sup>52</sup> The epidemic form of polio did not respect international borders or even oceans for that matter, and it eventually made an appearance in the United States.

The first recorded American polio epidemic occurred in Vermont at the end of the nineteenth century. In 1894, children in the town of Otter Creek began to display paralytic symptoms. As the epidemic grew, a local physician, Charles S. Caverly, began to explore each case. Through this epidemiology, Caverly is credited for noting the role that water played in the spread of the disease and the occurrence of non-paralytic cases.<sup>53</sup>

As the twentieth century dawned, with the worst of the polio epidemics as well as its eventual demise at the hands of Salk and Sabin decades away, onto the scene stepped a man who would shape, for better or worse, the scientific community's response to polio well into the 1930s. Simon Flexner, the first director of the Rockefeller Institute, dedicated the majority of his professional life to the study of poliomyelitis. Flexner got away from the epidemiology that was characteristic of early polio research and focused instead on studying the disease within the safe confines of a laboratory.<sup>54</sup>

Flexner's unwillingness to view the disease outside of his controlled laboratory experiments was one of the major criticisms leveled against him. It also was the cause of one of his biggest errors. In passing the poliovirus through monkey after monkey, the virus that Flexner was using mutated into one that could only infect nervous tissue. Thus, "Flexner and his colleagues created a virus in the laboratory and then erroneously began to relate its properties to

---

<sup>52</sup> Paul, *A History of Poliomyelitis*, 77.

<sup>53</sup> Berg, 24-5; Oshinsky, 11.

<sup>54</sup> Oshinsky, 14; Paul, *A History of Poliomyelitis*, 114-5.

the clinical experience of the disease.”<sup>55</sup> Despite this, Flexner was often considered the preeminent polio researcher and any theory, no matter how true, that seemed to contradict his work was disregarded.

In 1916, in the middle of Flexner’s hay-day as the premier polio researcher, the disease left an indelible impression on American society. That year witnessed the worst outbreak of polio up to that point, with the highest concentration of cases occurring in New York City. Early in the summer, cases of Infantile Paralysis began to spring up all over the city, and by mid-June a severe epidemic had begun. In July, New York’s mayor was forced to expand the emergency powers of the city’s public health department in order to meet the crisis.<sup>56</sup> The disease carried on undaunted.

The most striking feature of the 1916 epidemic in New York was the lack of knowledge that pervaded the situation. Infantile Paralysis was still a very misunderstood disease, and the link between epidemics and better sanitation had not yet been made. Therefore, the public blamed the outbreak on anything they could. Immigrant families and their unclean lifestyles were believed to have brought the disease to the city and spread it among white middle class families. Books that had been checked out from the New York public libraries were incinerated for fear of germs. Even pets were blamed for the spread of the disease. New York health officials killed over 70,000 cats in an attempt to stop the epidemic, with no result.<sup>57</sup>

Despite these efforts the epidemic rose to never-before seen proportions. New York City alone witnessed 8,900 cases of polio, 2,400 of which proved fatal. Americans outside of New

---

<sup>55</sup> Naomi Rogers, *Dirt and Disease: Polio Before FDR* (New Brunswick: Rutgers University Press, 1996), 24.

<sup>56</sup> Rogers, *Dirt and Disease*, 11.

<sup>57</sup> Rogers, *Dirt and Disease*, 3-4, 10, & 58-9; Berg, 16-7; Jeffrey Kluger, *Splendid Solution: Jonas Salk and the Conquest of Polio* (New York: G. P. Putnam’s Sons, 2004), 16.

York lost approximately 2,600 lives to the disease during the same period.<sup>58</sup> Although Americans at the time were more focused on events playing out in Europe, the country still took notice. After 1916, “the United States had become polio conscious.”<sup>59</sup>

While polio rates continued to climb for the next two decades, no outbreak even came close to matching the magnitude of the 1916 epidemic. Despite this, the decade of the 1930s was a watershed moment in the polio experience. The first major development that occurred during this decade was the creation of the Yale Poliomyelitis Commission. This commission was set up in response to the Connecticut outbreak of 1931.<sup>60</sup> The importance of this moment was two-fold. First, participating in this commission was a young scientist named John R. Paul. Paul would go on to become one of the world’s foremost experts on the disease, the major player in the American military’s polio research during World War II, and the author of perhaps the most important historical work on polio.

The calling up of the Yale Poliomyelitis Commission to study the Connecticut outbreak was also important because it began a trend of calling in a team of experts anytime an epidemic occurred. Paul claims that this trend was as much for show and public relations as it was a chance for these scientists to study this disease as it naturally occurred.<sup>61</sup> Either way, this field research represented a break from Simon Flexner’s laboratory research. The American military would employ similar commissions to study infectious diseases, including polio, during World War II.

In 1934, the Yale Poliomyelitis Commission was called to Los Angeles to study a polio epidemic occurring in that city. This epidemic was unique in that the majority of cases were

---

<sup>58</sup> Oshinsky, 22.

<sup>59</sup> Richard Carter, *Breakthrough: the Saga of Jonas Salk* (New York: Trident Press, 1966), 11.

<sup>60</sup> Paul, *A History of Poliomyelitis*, 208.

<sup>61</sup> Paul, *A History of Poliomyelitis*, 208.

found in adults. While some contemporary scientists doubted the diagnoses of polio, Paul claims that the virus was successfully discovered in several cases.<sup>62</sup> The reason this epidemic is important to note is precisely this large number of adult cases. While it was not unheard of for polio to infect adults, it was still primarily viewed as a childhood disease. The Los Angeles epidemic foreshadowed the growing susceptibility to the disease of older individuals and can be compared to the overseas outbreaks among American servicemen during World War II, which had the distinction of being rare cases of epidemics among a purely adult population.

Another major polio-related event that occurred during the decade of the 1930s was the spectacularly unsuccessful Park-Brodie and Kolmer vaccine race. The first of these vaccines, the Park-Brodie vaccine, was created by a rising star in the scientific world, Dr. Maurice Brodie and his mentor at the Bureau of Laboratories for the New York Department of Health, Dr. William H. Park. The second vaccine was created by John A. Kolmer of Temple University. Both research teams, operating under flawed concepts of the virus, rushed to test these vaccines on human subjects. What resulted made it abundantly clear that polio would not go quietly into the night.<sup>63</sup>

Shortly after the polio vaccines were tested, children began to come down with paralytic cases of poliomyelitis. Paul states that Kolmer's vaccine very likely caused a high rate of polio among the children that were given vaccinations.<sup>64</sup> While the problems with the Park-Brodie vaccine were less evident, "the nation was not sure where Brodie left off and Kolmer began, or vice versa."<sup>65</sup> The results of these failed vaccine tests were ruined careers, depressed individuals,

---

<sup>62</sup> Paul, *A History of Poliomyelitis*, 217-8.

<sup>63</sup> Kluger, 51-2 & Berg, 97.

<sup>64</sup> Paul, *A History of Poliomyelitis*, 258-9.

<sup>65</sup> Carter, 23.

and a belief amongst the scientific community that there was a lot that had to be learned about the virus before another vaccine was attempted.<sup>66</sup>

The 1940s witnessed the American polio rates rising to unprecedented levels, especially during the years that America was involved in World War II. Historian Heather Green Wooten observed that “as the war planes soared, so did the incidence of polio across the United States.”<sup>67</sup> This followed three years, from 1939 to 1941, that had witnessed 27,000 new cases of polio, the most of any similar period to that point. The trend continued during the war years, with each year exceeding the last culminating in over 19,000 new cases in 1944 alone. These statistics made 1944 the second worst year for polio since the 1916 epidemic. In 1945, the United States experienced another 13,624 cases. Clearly, polio was becoming a major problem for Americans.<sup>68</sup>

With the rising rates of polio came more frequent and larger epidemics. These epidemics brought pervasive fear and disruption to the communities affected. The National Foundation for Infantile Paralysis was often called in to help local medical officials organize resources to combat the disease. Following on the Foundation’s heels were usually a team of experts such as the Yale Poliomyelitis Commission who came to study some aspect of polio in the field. Finally, in many cases, the NFIP or civilian authorities appealed to the various branches of the military to help provide resources or medical care to the victims.

The first of these major epidemics to occur during the war years was the 1943 epidemic in Chicago, Illinois. Cases of polio began springing up throughout the city during the summer

---

<sup>66</sup> Paul states that Brodie found his job opportunities severely diminished and is said to have taken his own life shortly afterwards, *A History of Poliomyelitis*, 261; and Oshinsky states that the vaccine race “fueled the curiosity of researchers about what had to be learned before proceeding again,” 58.

<sup>67</sup> Wooten, 55.

<sup>68</sup> Black, 26 & 30; Wooten, 59; “Medicine: Polio,” *Time Magazine*, December 4, 1944, s.v. “polio”. <http://www.time.com> (Accessed 10 July 2011); Bazzett, 107.

months, and it became painfully evident that this was not going to be a mild polio year in the windy city. By September, 574 cases had been diagnosed with fifty-six of them proving fatal.<sup>69</sup>

Public opinion began to blame pollution from Lake Michigan as the source of the epidemic. In response, Congressman William A. Rowan introduced a bill into the US House of Representatives that called for reducing the pollution in the great lake while setting up several foundations to study the spread of water-borne viral diseases.<sup>70</sup> It appears that this did not have the desired effect. In October, seeking similar ends, Illinois Attorney General George F. Barrett appealed to the US Supreme Court for the authority to levy an injunction to keep pollution from being dumped into Lake Michigan by cities in Indiana.<sup>71</sup>

Eventually the polio epidemic receded on its own. As the winter months came, like all other continental polio epidemics, the disease mysteriously vanished. In its wake, it left behind over 1,200 victims and more than 100 fatalities.<sup>72</sup> While the Chicago epidemic foreshadowed the rising frequency of such large outbreaks, the city's experiences were also valuable in helping to shape the country's response to future epidemics.

The last full year of the war, 1944, witnessed the largest number of polio cases in America in almost thirty years. By August, the *Chicago Daily Tribune* was reporting that the week of July 22 through 29 had seen 738 new cases, the most of any week since the 1916 epidemic. The number of cases for the year stood at 3,060, the highest total since 1934.<sup>73</sup> The epidemic would only get worse. In a little over three weeks, the number of cases had surpassed the 6,000 level, officially making 1944 the worst year for polio since 1916.<sup>74</sup> Stueben County,

---

<sup>69</sup> "26 New Cases, 2 Polio Deaths are Reported," *Chicago Daily Tribune*, September 5, 1943.

<sup>70</sup> "Rowan Drafts Plan to Reduce Lake Pollution," *Chicago Daily Tribune*, September 9, 1943.

<sup>71</sup> "State Demands U.S. Aid Chicago in Water Crisis," *Chicago Daily Tribune*, October 10, 1943.

<sup>72</sup> "New Polio Case Raises Total for Year to 1,221," *Chicago Daily Tribune*, November 11, 1943.

<sup>73</sup> "738 Polio Cases in Week Highest for U.S. Since '16'," *Chicago Daily Tribune*, August 5, 1944.

<sup>74</sup> "Polio Outbreak in U.S. Climbs to 28 Year Peak," *Chicago Daily Tribune*, August 30, 1944.

New York was reported to have the highest rate of polio cases for the year, with the unheard of rate of 381 cases per 100,000 individuals.<sup>75</sup>

One of the epidemics that contributed to the 1944 totals occurred in the state of Kentucky. Like the Chicago epidemic of the year before, the summer began with a few innocuous cases of polio being reported. By July, as the number of cases in the state began to mount, Kentucky's polio epidemic became front page news "alongside war reports about the Normandy beachhead, the Russian front, the Allied advance in Italy, and the American invasion of Saipan."<sup>76</sup> This fame was short-lived, as a much more devastating epidemic began to emerge just two states away.

On 30 May 1944, North Carolina witnessed the season's first case of polio. Before state health officials knew what had hit them, the total number of new cases rose to never-before-seen levels. The epidemic completely overwhelmed western North Carolina's medical resources, and health officials realized that they had to do something drastic. The decision was made to construct a temporary polio hospital at the site of a National Youth Administration fresh air camp outside of Hickory, North Carolina.<sup>77</sup>

The ambitious project was begun with a severe disadvantage brought about by the war time shortage of building supplies. However, the hospital was quickly able to acquire the materials it needed through donations. Some of these donations came from military establishments. Colonel Frank Wilson, head of Moore General Hospital, donated equipment,

---

<sup>75</sup> Michael W. R. Davis, "Kentucky's 1944 Polio Epidemic," *Filson Club History Quarterly* 74 (2000): 365.

<sup>76</sup> Michael W. R. Davis, 357.

<sup>77</sup> Alice E. Sink, *The Grit Behind the Miracle: A True Story of the Determination and Hard World Behind an Emergency Infantile Paralysis Hospital, 1944-45, Hickory, North Carolina* (Lanham: University Press of America, 1998), 23-5.

supplies, and beds to the Hickory hospital. Because of this charity, the hospital was able to open on 24 June after just fifty-four hours of construction.<sup>78</sup>

The National Foundation for Infantile Paralysis was eventually called in to monitor the situation. Basil O'Connor, the Foundation's director, was so concerned with the situation that he sent his medical director, Dr. Don W. Gudakunst to oversee the progress of the temporary hospital.<sup>79</sup> Edward A. Piszczek, Cook County, Illinois' Public Health Director was also brought in to help with the operations at the hospital. Piszczek was selected by the NFIP due to his experience gained during the Chicago epidemic of the year before.<sup>80</sup>

Meanwhile, the Army continued to assist the work being done at Hickory. Major S.D. Craig, a specialist in internal medicine was sent to oversee the work at the temporary hospital. The Army also saw to the other more basic needs. Local troops stationed in Asheville were brought in to assist with sanitation. For most of these troops, this meant boiling the laundry before it was sent into the community to be washed through orthodox means. After the first week of operation, it became evident that the hospital needed to be expanded. The Army once again came through and donated a number of tents which its soldiers set up on the hospital's campus. These tents were the only shelters that comprised wards three and four.<sup>81</sup>

While the temporary hospital at Hickory was only in operation for nine months, it is certainly one of the most intriguing polio related stories to come out of this era. Despite being a collection of quickly constructed buildings and army tents, the hospital treated 454 patients in 1944.<sup>82</sup> All of this was accomplished in the center of the worst epidemic to hit the east coast since New York City suffered the massive epidemic of 1916 and while the bulk of the country's

---

<sup>78</sup> Sink, 30, 32, & 39.

<sup>79</sup> Sink, 36.

<sup>80</sup> Sink, 42 ; "Piszczek Home After Founding Polio Hospital," *Chicago Daily Tribune*, August 3, 1944.

<sup>81</sup> Sink, 36 & 45-6.

<sup>82</sup> Sink, 100.

resources were being allocated to the Allied assault on Hitler's Fortress Europe.<sup>83</sup> The effectiveness of this hospital was a testament to the cooperation between local health officials, the NFIP, and the military.

The following summer, another major epidemic hit Illinois. The Rockford epidemic of 1945, while not achieving the notoriety of the Hickory epidemic of the year before, was a case study in the cooperation between the military and civilian medical officials. To combat a shortage of medical personnel, the American Red Cross asked the Army Surgeon General to provide Army nurses to help treat patients during this epidemic.<sup>84</sup> He came through and fifty such nurses were eventually shipped in from Camp McCoy in Wisconsin.<sup>85</sup>

It was also during the Rockford epidemic that Yale scientist and member of the Neurotropic Virus Disease Commission of the Army Epidemiological Board, John R. Paul, used Army Air Corps bombers to test the efficacy of the insecticide DDT as a means to halt the spread of polio.<sup>86</sup> This epidemic also had the distinction of starting while the US was still at war, hitting its high-water mark during the celebrations of V-J Day, and winding down during the first few postwar months.<sup>87</sup>

So what caused these rising rates of polio? The public began to see a correlation between returning soldiers and the growing number of polio cases. In fact, many individuals blamed these soldiers on carrying the disease back to the States with them.<sup>88</sup> This belief also proved to be very similar to the view that British and some American military experts held on outbreaks of polio among servicemen in the Middle East and the Philippines. Polio was also not the only disease

---

<sup>83</sup> Tony Gould, *A Summer Plague: Polio and its Survivors* (New Haven: Yale University Press, 1995), 112.

<sup>84</sup> "Army Asked for Nurses to Curb Polio Epidemic," *Los Angeles Times*, August 19, 1945.

<sup>85</sup> "Bomber Sprays Rockford with DDT in Polio War," *Chicago Daily Tribune*, August 20, 1945.

<sup>86</sup> "Bomber," *Chicago Daily Tribune*, August 20, 1945.

<sup>87</sup> "Rockford Polio Increase Laid to V-J Celebration," *Chicago Daily Tribune*, August 26, 1945.

<sup>88</sup> Oshinsky, 69.

that was seen as a threat to be brought back from overseas by GIs. Medical historian Margaret Humphreys, in her book *Malaria: Poverty, Race, and Public Health in the United States*, argues that state-side malaria outbreaks were believed to be a possible side effect of returning servicemen.<sup>89</sup> As it relates to polio, this belief is an excellent indicator of the fundamental lack of understanding of the disease that still abounded in the mid-1940s.

A more probable explanation for the rising rates of polio is two-fold. First, because sanitation in the United States had continued to improve since the turn of the century, more and more individuals were reaching adolescence and even adulthood without ever encountering the disease, increasing the proportion of Americans who were without a natural resistance. Furthermore, Americans in the 1940s were significantly more mobile than they ever had been. The Great Depression uprooted individuals from their familial homes and sent them across the country looking for employment. This continued during the war years as Americans not serving in the military tended to crowd into manufacturing cities in order to find work. Couple this with thousands of young men being transported to various army camps and training facilities, and you have the recipe for the spread of an epidemic disease such as polio.

Perhaps the most important event that shaped the polio experience during World War II did not actually occur in the 1940s. Any discussion of polio post 1921 has to include the illness of Franklin Delano Roosevelt. Historians have often argued that his experience shaped that of every subsequent American polio victim. Mary M. Shaffer and Bernard Seytre argue that “even more than the devastation of the disease, the story of Franklin Roosevelt holds the key to understanding the overwhelming popular reaction to polio in America.”<sup>90</sup> Clearly, FDR and his

---

<sup>89</sup> Margaret Humphreys, *Malaria: Poverty, Race, and Public Health in the United States* (Baltimore: Johns Hopkins University Press, 2001), 140.

<sup>90</sup> Mary M. Shaffer and Bernard Seytre, *The Death of a Disease: A History of the Eradication of Poliomyelitis* (New Brunswick: Rutgers University Press, 2005), 32.

National Foundation for Infantile Paralysis had a major impact on the polio story, especially during the 1940s.

FDR's battle with polio is well known. Polio scholar Tony Gould claims "the story has been told so many times that it has been encrusted with myth."<sup>91</sup> In early 1921, Roosevelt left Washington, physically and emotionally exhausted from the Newport Scandal.<sup>92</sup> This exhaustion undoubtedly made him more vulnerable to an infection of polio. He then attended a Boy Scout Jamboree at Bear Mountain, New York before proceeding to his family escape on the island of Campobello in New Brunswick. Precisely which of these locations provided FDR's exposure to the disease is a matter of conjecture. Once on the island and after yachting with his family, fighting a forest fire, and swimming with his sons, Roosevelt began to feel under the weather.<sup>93</sup>

When it became clear that the illness was not going to abate on its own, the Roosevelts phoned Dr. E. H. Bennett, a physician known to be staying in the area. Upon examining the patient, Dr. Bennett diagnosed a severe cold.<sup>94</sup> Roosevelt's biographer, Jean Edward Smith, calls Dr. Bennett "an elderly country doctor, well suited to delivering babies and setting broken bones but not especially qualified for complex diagnosis."<sup>95</sup> In Dr. Bennett's defense, polio was still a very obscure disease at this time so knowledge of its symptoms was not widespread. This was complicated by the fact that the early stages of a polio infection could indeed resemble a severe cold or influenza. Furthermore, even if Dr. Bennett had been acquainted with the symptoms of

---

<sup>91</sup> Gould, 29.

<sup>92</sup> The Newport Scandal involved Roosevelt's role as Undersecretary of the Navy in a series of investigations of alleged homosexuality among naval recruits in Newport. The investigators were said to have used questionable methods bordering on entrapment to out the accused recruits. The entire matter subsequently came to light and was the subject of a Congressional investigation. For more on the Newport Scandal see Jared Gardner, "'Our Native Clay': Racial and Sexual Identity and the Making of Americans in the Bridge," *American Quarterly* 44, no. 1 (March 1992): 32-3, JSTOR.

<sup>93</sup> Jonathan Alter, *The Defining Moment: FDR's Hundred Days and the Triumph of Hope* (New York: Simon and Schuster, 2006), 48-9; Kluger, 30; Berg, 44-5.

<sup>94</sup> Berg, 45.

<sup>95</sup> Jean Edward Smith, *FDR* (New York: Random House, 2007), 189.

the disease, adult cases of infantile paralysis were almost unheard of during this period of time, so a diagnosis of polio was unlikely.

Despite the benign diagnosis, the patient's condition continued to deteriorate and he eventually lost the majority of his muscle function. It quickly became clear that a second opinion was needed. Contact was made with a specialist, Dr. W. W. Keen. Keen, suspecting polio almost immediately, recommended that the family contact Dr. Robert Lovett, a professor of orthopedics at Harvard and a leading expert on infantile paralysis.<sup>96</sup>

Roosevelt was left on Campobello until he was well enough to be moved to a more suitable facility. During this period, his wife Eleanor served as his devoted nurse, watching over him and providing for his every need, even to the extent of administering enemas. Finally, in September, FDR was moved to New York's Presbyterian Hospital to undergo further treatment at the hands of Dr. George Draper, somewhat of a polio expert himself. In 1917, he had published a monograph on infantile paralysis in which he had attempted to prove that individuals were more susceptible to the disease because of their constitution.<sup>97</sup> It is clear that between Lovett and Draper, Roosevelt received the best care available to any polio patient in the 1920s.

Despite the high level of care that FDR received, the strength of his leg muscles simply did not return. Although Roosevelt had survived the infection, the after-effects were with him for the remainder of his life. Knowing this and the detriment it could have on his future in politics, FDR's closest adviser Louis Howe began to create an image for Roosevelt that downplayed both his initial bout with the disease and its crippling effects.<sup>98</sup> The image of Roosevelt as a man who

---

<sup>96</sup> Berg, 45-6; Jean E. Smith, 190; Smith also argues that it was actually FDR's uncle Frederic A. Delano, at the urging of Louis Howe, who contacted Dr. Robert Williamson Lovett, 190. However, I believe the recommendation of Keen was probably the major reason Dr. Lovett was contacted, even if it was Delano who contacted him.

<sup>97</sup> Alter, 50; Jean E. Smith, 192; Paul, *A History of Poliomyelitis*, 161-2.

<sup>98</sup> Jean E. Smith, 195.

conquered polio outlived both its creator and its subject and has only recently come under attack by historians.

FDR certainly had a major impact on his fellow polio victims. Once he had ascended into the presidency, he used his new found power to create national organizations that worked for improved treatment and prevention of the disease. Combine this with the myth that Roosevelt had conquered poliomyelitis and he was quickly seen as the quintessential polio victim.<sup>99</sup> The American public bought into this myth completely with almost every American believing that he had more or less entirely regained his health.<sup>100</sup> He “became *the* symbol of an ‘overcomer.’”<sup>101</sup>

Many polio victims believed they shared a special bond with Roosevelt. They were convinced that he sympathized with their plights personally. This led many of them to send him letters asking for advice on how to defeat the poliovirus.<sup>102</sup> The belief that Roosevelt was interested in an individual’s case is best illustrated in the story of Bentz Plagemann. Plagemann, a Pharmacist’s Mate in the US Navy, had contracted polio in Sicily during World War II. Upon being evacuated back the United States, he was eventually sent to the polio hospital at Warm Springs, Georgia. Plagemann credits FDR specifically with interceding in his case and having him reassigned to Warm Springs.<sup>103</sup> In all likelihood, Roosevelt was never familiar with Plagemann’s case. His assignment to Warm Springs simply reflected the Navy’s gradual shifting of polio cases to Warm Springs, where it eventually set up an official polio ward, but to Plagemann it was all done because of FDR’s special relationship with those who suffered from the disease.

---

<sup>99</sup> Daniel J. Wilson “A Crippling Fear: Experiencing Polio in the Era of FDR,” *Bulletin of the History of Medicine* 72 (1998): 464, Project Muse.

<sup>100</sup> Alter, 256.

<sup>101</sup> Author’s Emphasis, Richard J. Altenbaugh, “Where are the Disabled in the History of Education? The Impact of Polio on Sites of Learning,” *History of Education* 35, no. 6 (Nov 2006): 716, JSTOR.

<sup>102</sup> Wilson “A Crippling Fear,” 468.

<sup>103</sup> Bentz Plagemann, *My Place to Stand* (New York: Farrar, Straus, & Company, 1949), 126.

In recent years, this image of Roosevelt as a benefactor to polio victims has come under attack by historians. Daniel J. Wilson calls FDR an “ironic model for the polio survivor.”<sup>104</sup> He argues that the President gave victims unrealistic expectations of being able to resume a life unchanged from what it was prior to the initial polio infection. For the vast majority of those who suffered from the paralytic form of the disease, this was a pipe dream.

The controversy over the real FDR would outlast even the man who embodied it. Decades after Roosevelt’s death, the United States was set to commemorate a memorial to the longest tenured president in its history. During the construction of this memorial, a major controversy arose over whether to portray the man as most of his contemporaries knew him, an able-bodied man standing, or as he truly was, seated in a wheel-chair.<sup>105</sup> It was over a half century after his death, and Americans still could not agree on who FDR really was.

There has also been some recent debate among scholars as to whether or not what Roosevelt was suffering from was really polio.<sup>106</sup> FDR’s symptoms were very much like those of a typical case of poliomyelitis. Couple this with the fact that FDR was raised in a situation that protected him from encountering a disease like polio as a child and developing immunity to it, and you have a pretty compelling argument. However, the importance of this issue is not whether he indeed had the disease but rather as David Oshinsky writes “that FDR believed he had polio.”<sup>107</sup> This belief, his philanthropy towards other polio victims, and these polio victims’ belief that he had the disease make Roosevelt the most famous polio victim of all time, whether he truly was or not.

---

<sup>104</sup> Wilson “A Crippling Fear,” 464.

<sup>105</sup> Davis W. Houck and Amos Kiewe, *FDR’s Body Politics: The Rhetoric of Disability* (College Station: Texas A&M University Press, 2003). 3-4. The statue of Roosevelt in a wheel-chair eventually won out.

<sup>106</sup> Armond S. Goldman et al. argue that his illness was inconsistent with polio in Armond S. Goldman, Elizabeth J. Schmalstieg, et al. “What was the Cause of Franklin Delano Roosevelt’s Paralytic Illness?” *Journal of Medical Biography* 11, no. 4 (2003): 232-40.

<sup>107</sup> Oshinsky, 28.

FDR's most lasting contribution to the history of polio began in the summer of 1924 when he was alerted to the existence of a series of warm springs in the hills of southwest Georgia. George Foster Peabody is noted as being the individual who first told Roosevelt of their existence, primarily because Peabody had just purchased a run-down resort, known as the Meriweather Inn, which bordered the springs. The springs were reported to have miraculous healing qualities, and Roosevelt was invited to come check these claims out for himself. Roosevelt was so convinced by his visit that within two years he had finalized a contract making him the sole owner of Warm Springs in return for approximately \$200,000, which represented a large portion of his wealth.<sup>108</sup>

Roosevelt wanted Warm Springs to become the world's foremost polio treatment facility. With this end in mind, he hired Dr. Leroy Hubbard to supervise the rehabilitation program. Hubbard and his nurse Helena Mahoney immediately began putting together the Warm Springs staff by hiring graduates from Nashville's Peabody College to serve as physical therapists. The summer of 1926 was dedicated to experimental treatments to discover the actual benefit of such hydrotherapy treatments using geothermal water. The results exceeded Roosevelt's expectations, and he rushed off to visit the National Convention of Orthopedists being held in nearby Atlanta. After much negotiation, FDR convinced the convention to send a committee to check out his treatment facility. Following a positive report by the committee, Warm Springs became a nationally renowned polio facility.<sup>109</sup>

With increased fame came an increased number of patients. However, not all could afford the facility's charge of forty-two dollars a week. For those who could not, Roosevelt paid for

---

<sup>108</sup> Oshinsky, 35 & 39; Black puts the number closer to \$195,000, 24; Jean E. Smith, 215.

<sup>109</sup> Jean E. Smith, 217; "Big Development at Warm Springs Will be Rushed," *Atlanta Constitution*, May 9, 1926; Berg, 50.

their treatment.<sup>110</sup> FDR took pride in this fact, boasting in his speech following the first annual President's Birthday Ball that "at Warm Springs the facilities are available, in as far as beds and funds permit, to the rich and to the poor."<sup>111</sup> Roosevelt's role at Warm Springs did not end there. He took an active interest in the other patients' progress, earning himself the informal nickname "Doc Roosevelt."<sup>112</sup> During this period, Roosevelt gave himself another nickname, this one reflecting a much lighter side of both the man and of Warm Springs. Roosevelt began to refer to himself as "Vice-President for Picnics."<sup>113</sup>

The Georgia Warm Springs Foundation was the one place where Roosevelt shed his public persona as a strong able-bodied man and simply "accepted being a polio."<sup>114</sup> Plagemann comments that it was here that "the man of so many roles reserved for himself the privilege of being himself."<sup>115</sup> While most Americans during the 1930s and 1940s felt that they knew FDR personally, Plagemann argues that it was "we who sat with him in our wheel chairs, opposite his wheel chair, learned, possibly with surprise even for us, that the President was, like ourselves, a polio first, and a man and president after that."<sup>116</sup>

As Warm Springs's patient list continued to grow, it became obvious that the facilities were going to have to be modernized to meet the demand, as the old Meriweather Inn was quickly becoming obsolete. In order to do this a plan was devised in which the old method of fund-raising, reaching out to a few wealthy individuals, was forgotten and instead calls for donations of all sizes went out to every citizen in Georgia. The result was so spectacular that a

---

<sup>110</sup> Jean E. Smith, 217.

<sup>111</sup> Franklin D. Roosevelt, Address of the President on the Occasion of his 52<sup>nd</sup> Birthday Anniversary, January 30, 1934, National Archives and Records Administration, <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>, s.v. "Poliomyelitis", (Accessed 24 June 2011).

<sup>112</sup> Adam Cohen, *Nothing to Fear: FDR's Inner Circle and the Hundred Days that Created Modern America* (New York: Penguin, 2009), 43.

<sup>113</sup> Alter, 62.

<sup>114</sup> Altenbaugh, 716.

<sup>115</sup> Plagemann, 207.

<sup>116</sup> Plagemann, 214.

similar method continued to be used for all subsequent polio fund-raising campaigns.<sup>117</sup> The new building was named Georgia Hall, to honor the multitude of Georgians whose generosity paid for its construction.

Despite the good omen that was the successful fund-raiser, Warm Springs did suffer during the Great Depression. In fact, it became painfully evident that if the facility did not get an infusion of money, it was in danger of going under. With this in mind, the director Basil O'Connor hired Carl Byoir to help market Warm Springs. It was Byoir who came up with the idea to have a nationwide fundraising party on FDR's birthday, with the first being held on 30 January 1934. In the results of the 1933 Georgia fund-raiser, Byoir recognized the benefit of appealing to the masses to get them to each donate a small sum of money.<sup>118</sup>

Byoir and the other members of the Georgia Warm Springs Foundation eventually decided that the fund-raising effort for FDR's birthday should be a series of dances, or birthday balls, which could earn donations from participants to help fund Warm Springs. Similar balls were quickly organized to be held locally all over the United States. Participants were urged "to dance so that others might walk."<sup>119</sup> The idea was a complete success with the first round of birthday balls bringing in more than \$1 million.<sup>120</sup>

Following these initial balls, FDR took to the airwaves to address the nation on what, up to that point, was the largest radio audience in history.<sup>121</sup> Roosevelt told his listeners that it was "the happiest birthday [he had] ever known." He was grateful for the outpouring of support for

---

<sup>117</sup> David L. Sills, *The Volunteers, Means and Ends in a National Organization* (Glencoe: The Free Press, 1957), 42-3.

<sup>118</sup> Oshinsky, 47-8 & 51.

<sup>119</sup> Carter, 14.

<sup>120</sup> Oshinsky, 50.

<sup>121</sup> Carter, 14.

Warm Springs. FDR also told his listeners that the work being done in Georgia was very close to his heart.<sup>122</sup> By the response from the public, it was evident that it was close to theirs as well.

Initially, the money raised in the birthday balls was supposed to be used to assist Warm Springs and its patients. Eventually, as money poured in, a portion of the funding began to be allocated for a different purpose. During their first meeting, the scientist and author Paul de Kruiff is reported to have asked the manager of Warm Springs, Arthur Carpenter, “Why do you use all that dough to dip cripples in warm water?” Instead, de Kruiff suggested spending a portion of the funds on medical research for prevention of the disease. Such thinking brought about the creation of the President’s Infantile Paralysis Research Commission in 1935, with de Kruiff at the helm.<sup>123</sup>

Unfortunately for the commission and a number of children, de Kruiff’s first attempt at spending the money ended in what he called a “deplorable debacle.” Sold on the promises of an eradication of the disease, the commission gave a grant to Maurice Brodie to help fund the trial of his Park-Brodie polio vaccine.<sup>124</sup> Despite the inauspicious start, funding for research leading to the prevention of polio became a staple of the Georgia Warm Springs Foundation and later the National Foundation for Infantile Paralysis.

Basil O’Connor was perhaps the second most important name in polio, only slightly behind FDR. O’Connor’s story begins sometime in 1922, in the lobby of New York’s Fidelity & Deposit, the firm that touted Franklin Roosevelt as its Vice President. The legend claims that Roosevelt, upon slipping and falling in the middle of the floor, was immediately assisted by

---

<sup>122</sup> Roosevelt, 52<sup>nd</sup> Birthday Address.

<sup>123</sup> Paul De Kruiff, *The Sweeping Wind* (New York: Harcourt, Brace & World, 1962), 177.

<sup>124</sup> De Kruiff, 178.

O'Connor who worked in a nearby building. Fairly soon after this incident the two became legal partners.<sup>125</sup>

O'Connor who was educated at Dartmouth and Harvard Law School quickly began to show his hard work and his worth.<sup>126</sup> When Roosevelt was elected Governor of New York, he named O'Connor as his successor as the head of Warm Springs.<sup>127</sup> From this point forward, O'Connor became an integral part of the polio crusade. When the NFIP was formed, he was named to head the agency. It was holding this post that made O'Connor arguably the most powerful individual in the battle against polio.

De Kruiff calls O'Connor "second only to the President himself in political acumen and sagacity and [...] the greatest raiser of research money for a specific cause that the world has ever known."<sup>128</sup> It was this latter quality that proved to be the most important to his cause. The sheer amount of money that his NFIP would raise over the course of its nearly two full decades of existence is staggering. That this money eventually served to bring about the eradication of polio at the hands of the Salk vaccine is a testament to the man who saw the crusade through to its end.

The political acumen that de Kruiff mentions was important as well. O'Connor often had to call in favors to ensure that things continued to run smoothly both at the NFIP and at Georgia Warm Springs. When the call-to-arms during World War II threatened to deprive Warm Springs of one of its most important physicians, Dr. Robert Bennett, O'Connor is said to have pulled some strings to ensure that he would not be drafted.<sup>129</sup> Eventually FDR, who approved of O'Connor completely, gave him the job of heading the American Red Cross after its previous

---

<sup>125</sup> Jean E. Smith, 201; Oshinsky, 34.

<sup>126</sup> Jean E. Smith, 201.

<sup>127</sup> Oshinsky, 47.

<sup>128</sup> De Kruiff, 183.

<sup>129</sup> Gould, 113.

chairman, Norman H. Davis, died in 1944.<sup>130</sup> It was while in this role that O'Connor convinced the US Army to provide nurses to help treat patients in the Rockford Epidemic of 1945. While he would discharge these duties to the best of his ability, O'Connor's major focus and the bulk of his effort were spent overseeing his foundation.

The National Foundation for Infantile Paralysis was the "largest voluntary health organization of all time." Founded in 1938, the Foundation's importance to the struggle against polio cannot be overstated.<sup>131</sup> Paul argues that while the NFIP was not the only reason success was achieved in the battle against polio, it certainly expedited the process.<sup>132</sup> As with its founder, FDR, and its chairman, O'Connor, the NFIP was one of the foremost influences on the polio experience during World War II.

The Foundation was created in an attempt to make the battle against polio as nonpartisan as it could be. By the late 1930s, Roosevelt's popularity had begun to erode, and a segment of the population was virulently opposed to him. After a couple of issues over Warm Springs began to be used by Republicans as political ammunition, it became clear to Roosevelt and O'Connor that something had to be done to keep their polio work from becoming a target.<sup>133</sup> While Roosevelt could never be completely taken out of the polio fight, nor did anyone desire this, his influence could at least be minimized.

The Foundation that emerged was unlike anything that had come before it. Gould calls it "an entirely new kind of voluntary organization, aggressively propagandist in a manner that has since become common place, spending large sums of money in order to raise even larger

---

<sup>130</sup> George Korson, *At His Side: the Story of the American Red Cross Overseas in World War II* (New York: Coward-McCann, 1945), x.

<sup>131</sup> Oshinsky, 53.

<sup>132</sup> Paul, *A History of Poliomyelitis*, 317-8.

<sup>133</sup> Carter, 15.

sums.”<sup>134</sup> It incorporated the fund-raising design employed by the Georgia Warm Springs Foundation of appealing to the masses for donations of many small sums. It also continued to spend this money on research to help prevent the disease. However, in order to raise the kinds of funds that the NFIP’s policies required, the Foundation needed a new tactic.

Philip Alcabes argues that epidemic diseases “create opportunities to convey messages.” “Often, the message seems to have less to do with the actual disease burden or death toll than political opportunism.”<sup>135</sup> Such statements certainly seem to reflect the American polio experience. The fear that accompanied the disease in America was inversely related to polio’s incidence and death rates. Sure, the American public dreaded the disease because of the senseless crippling of innocent children, but this alone does not explain it. No, the fear associated with polio was just as much a manifestation of the NFIP’s fund-raising tactics as it was anything else.<sup>136</sup>

Stories about cases of polio or polio outbreaks abounded in the news during the 1940s. Such a large amount of media attention invariably shaped the public’s perception of the disease.<sup>137</sup> Even if the malady occurred less frequently than others, Americans were more likely to have read about polio victims than the victims of these other diseases. The NFIP unquestionably reaped the benefits of such attention every January in its annual fund-raising effort.

The Foundation’s annual fund-raising effort is one of the most well-known of any of its programs. Named by celebrity Eddie Cantor as a play on the title of the popular short news films

---

<sup>134</sup> Gould, xiv.

<sup>135</sup> Phillip Alcabes, *Dread: How Fear and Fantasy Have Fueled Epidemics from the Black Death to Avian Flu* (New York: Public Affairs, 2009), 3.

<sup>136</sup> Oshinsky, 5.

<sup>137</sup> Sills, 118.

“the March of Time,” the March of Dimes was first implemented in 1938.<sup>138</sup> The concept behind this fund-raiser was to encourage Americans to mail their dimes to President Roosevelt in the White House to help him fight polio. In the first year alone, Americans responded by sending in 2,680,000 dimes.<sup>139</sup>

As the March of Dimes grew in success and popularity so did the entire concept of polio fund-raising. In some areas, late January brought about “Polio Sunday” services at local churches. These often coincided with the national fund-raising effort and added to them a religious aspect.<sup>140</sup> Eventually, the dime itself would become so synonymous with the fight against polio and with FDR that a Roosevelt dime was released on the first anniversary of the President’s birthday following his death.<sup>141</sup>

The attack on Pearl Harbor and America’s entrance into World War II put the whole concept of NFIP fund-raising and the March of Dimes in jeopardy. Prior to the 1943 campaign, Basil O’Connor was concerned that since Americans had something more important on their minds and a patriotic duty to buy war bonds that the Foundation’s coffers might dry up.<sup>142</sup> With this in mind, O’Connor approached the President to inquire about putting the fund-raiser on hold, perhaps indefinitely. FDR did not hesitate. He insisted that the fund-raising efforts of the NFIP should continue, calling epidemic polio “one of our greatest dangers.”<sup>143</sup>

Roosevelt’s decision to continue the March of Dimes and his faith that the American public still viewed polio as a worthy cause proved prescient. Fund-raising during the war was even easier than it was prior to its outbreak. The 1943 fund-raiser set a record with over \$5.5

---

<sup>138</sup> Oshinsky, 54.

<sup>139</sup> Black, 25.

<sup>140</sup> “Churches Here Will Observe ‘Polio Sunday,’” *Atlanta Constitution*, January 24, 1942.

<sup>141</sup> Oshinsky, 55.

<sup>142</sup> Wooten, 87.

<sup>143</sup> Franklin D. Roosevelt quoted in “Polio Birthday Fetes Okayed by Roosevelt,” *Atlanta Constitution*, November 17, 1942; Oshinsky, 68.

million brought in. This success was indicative of a number of factors. First, “with their men at war, wives and mothers, the stalwarts of polio prevention within the home, embraced the polio crusade in their communities.”<sup>144</sup> Furthermore, men and women in the military who were serving both at home and abroad and who were concerned about their communities contributed to the March of Dimes. Finally, the NFIP was reaping the benefits of a newly employed strategy of showing short polio films to American movie-goers and then encouraging them to donate by sending around volunteers to collect dimes before the start of the feature film.<sup>145</sup>

Raising funds during a war can result in a number of issues, most of which the NFIP had the foresight to take steps to eliminate beforehand. Perhaps the most potentially damaging charge against a charitable organization is that of taking advantage of a national emergency to fund its own cause. The Foundation, ever wary of such a charge, forbade any of its local chapters to raise funds through local community war chests. The national leadership felt that such a form of fund-raising could be construed as unethical. In 1944, this was taken up another notch when the NFIP banned participation in community chests of any kind.<sup>146</sup> The Foundation wanted any money used in the fight against polio to have been given with this end in mind. Because of the NFIP’s forthrightness on such issues, the American public rewarded it with millions of dollars every year of the war.

Try as it may, the NFIP could not ward off all possible controversy, especially at the local level. During the 1942 fund-raising effort in Atlanta, multiple president’s birthday dances were held. Lapel buttons were used to allow guests to gain entrance into each of the dances without having to make a separate donation. It all seemed to have gone off without a hitch until it was

---

<sup>144</sup> Wooten, 89.

<sup>145</sup> Gould, 112; “Polio Spread Greater Than for 9 Years: Foundation Head Says Nation May ‘Face Severe Test,’” *Atlanta Constitution*, July 31, 1943; Wooten 88-90.

<sup>146</sup> Sills, 54.

discovered that a number of these buttons had in fact been manufactured in Japan. The *Atlanta Constitution* reported that “Atlantans who helped fight against infantile paralysis Friday night by attending the President’s dances found out yesterday that they had also helped the Japanese fight Uncle Sam.”<sup>147</sup> Despite this embarrassment such controversy over polio fund-raising during the war seems to have been infrequent.

Although the NFIP did not want to be seen to be unfairly taking advantage of America’s entry into World War II, its leadership was not above adopting a militant rhetoric to frame the battle against polio and to convince the public to send in their donations. Wooten calls this a “quasi-military campaign to achieve victory over polio.”<sup>148</sup> However far of a stretch this may seem now, equating the battle against polio to the battle against Japan and Germany certainly struck a chord with the American public.

FDR was one of the first to adopt this rhetoric, and he used it often, right up until his death in 1945.<sup>149</sup> In his annual birthday address in 1944, Roosevelt told the public that the money they donated to the Foundation were “the victory bonds that buy ammunition for this fight against disease.” In this battle with polio he told them the NFIP was “prepared to fight it with the planned strategy of a military campaign.”<sup>150</sup> Later that year, in a response to an inquiry by O’Connor, FDR laid forth the aim of this campaign. He called for polio’s “unconditional surrender.”<sup>151</sup> Was this allusion to the agreed upon aims of the Allied powers in the war with the Axis merely a coincidence? It was probably not.

---

<sup>147</sup> “Polio Buttons Given Out Here Made in Japan,” *Atlanta Constitution*, February 1, 1942.

<sup>148</sup> Wooten, 87.

<sup>149</sup> Marc Shell, *Polio and its Aftermath: the Paralysis of Culture* (Cambridge: Harvard University Press, 2005), 189.

<sup>150</sup> Franklin D. Roosevelt, Address of Behalf of the National Foundation for Infantile Paralysis, January 29, 1944, National Archives and Records Administration, <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>, s.v. “Infantile Paralysis”, (Accessed 24 June 2011).

<sup>151</sup> Franklin D. Roosevelt quoted in Paul, *A History of Poliomyelitis*, 319.

Roosevelt truly believed polio to be a major issue during World War II. In the same 1944 address to the nation, he told the American people the need to fight effectively against polio was not simply because “the enemy was a merciless and insidious one, but because the danger of epidemic in wartime makes this fight an actual military necessity.”<sup>152</sup> Clearly he believed this was so and because of this belief, Roosevelt was willing to employ any tactic imaginable to bring a successful end to the struggle with polio. Unfortunately, FDR did not live to see the culmination of all of his hard work.

On 12 April 1945, while vacationing at Warm Springs, FDR passed away.<sup>153</sup> Just like that, the world’s most famous polio victim and its fiercest polio crusader was gone. His legacy among other polio victims was never in doubt. Plagemann writes in his memoirs, “now all the world knows that when Franklin Roosevelt came back in the spring, he came back forever.”<sup>154</sup> Such a statement is a clear indication that the polio patients at Warm Springs saw Roosevelt as one of their own, on loan to the rest of the country. These patients organized a march to honor the late President. Participating in this tribute were several servicemen who were recovering from bouts with polio at the Warm Springs’ facility.<sup>155</sup>

Despite this popularity among polio survivors, the NFIP had to wonder how the rest of the country was going to react. Would the multitude of Americans continue to give their dimes and dollars to the Foundation even though FDR was no longer its living representative? The American people answered with a resounding yes. Roosevelt may no longer have been around to thank Americans for their donations every 29 January, but reminders of him were all over the place, especially once his face adorned the piece of currency that had come to represent the

---

<sup>152</sup> Roosevelt, Speech, January 29, 1944.

<sup>153</sup> Jean E. Smith, 635-6.

<sup>154</sup> Plagemann, 216.

<sup>155</sup> “Patients at springs pay last sorrowful tribute to Roosevelt,” *Washington Post*, April 14, 1945.

struggle against polio, *his* struggle. Because of this, the American people would continue to donate until well into the 1950s, and this money was instrumental in bringing about the disease's defeat.

Roosevelt's belief that polio posed a problem to America's war effort was shared by a number of others. One notable example was New York Governor Thomas Dewey, who in a proclamation to create a 'poliomyelitis week' said, "In a time of war the health of our people—and particularly of our young people—is a vital factor for victory."<sup>156</sup> With the ever-growing numbers of polio victims, it was becoming clear that the disease certainly posed a threat to the health of Americans.

In the 1940s, polio was quickly becoming one of the most fearsome diseases in America. Humphreys notes that "part of the meaning attached to any disease label is the prognosis its name implies."<sup>157</sup> In the case of polio, this prognosis often meant paralysis and sometimes death. Thanks to the effective fund-raising campaigns of the NFIP, the name polio conjured images of children walking with leg braces and crutches, of men and women fighting for their lives inside Iron Lungs, of individuals with long, painful, and expensive roads to recovery with the chance of very minimal return. In short, a diagnosis of polio was a horrific nightmare, especially for parents.

These parents were especially concerned if they were serving overseas. FDR and the NFIP took pains to eliminate a portion of this fear almost immediately after the war began. In the 1942 version of Roosevelt's birthday address he told the nation that the Foundation had authorized its local affiliates to use a portion of the proceeds from its annual fund-raising drive to

---

<sup>156</sup> Thomas Dewey quoted in "Dewey Proclaims Poliomyelitis week," *New York Times*, January 26, 1943.

<sup>157</sup> Humphreys, *Malaria*, 119; for more discussion on panic brought about by epidemic disease see Margaret Humphreys "No Safe Place: Disease and Panic in American History," *American Literary History* 14, no. 4 (Winter 2002): 845-58, Project Muse.

lend extra support to children of servicemen who contracted the disease. The President said he hoped this was a “well-deserved boon to the fathers who are serving their flag on land and on sea in many parts of the world.”<sup>158</sup> While it is certain to have been a welcomed announcement, it surely did little to alleviate the worry of these parents.

A polio case occurring in the family of a serviceman also had implications on troop morale. Paul claims that “poliomyelitis can indirectly become a morale problem when it suddenly appears in the families of military personnel living on a large military post.”<sup>159</sup> With hundreds of families, many with young susceptible children living in close quarters on or around military bases, the chances of an outbreak of polio were high. The parents, becoming aware of these risks, lived with a constant fear of their children contracting the disease.

Children of servicemen were not the only family member susceptible to polio. Sometimes a soldier’s spouse contracted the disease. These cases were even more devastating to the family as many of these wives, with their husbands away, were raising their children alone. One such case involved a Mrs. James K. Wilson, who was a patient at the temporary hospital in Hickory in 1944. Mrs. Wilson’s husband was stationed in the China-Burma-India Theater while she was single-handedly raising their twenty-one-month old daughter.<sup>160</sup> It is not hard to imagine the level of anxiety this placed on both Mrs. Wilson and her husband.

One aspect of polio could be especially terrifying to parents, the cost of medical treatment. The treatment associated with polio was more costly than the treatment of any other

---

<sup>158</sup> Franklin D. Roosevelt, Radio Address of the President Delivered on the Occasion of his 60<sup>th</sup> Birthday Anniversary, January 30, 1942, National Archives and Records Administration, <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>, s.v. “Poliomyelitis”, (Accessed 24 June 2011).

<sup>159</sup> John R. Paul “Neurotropic Virus Diseases,” in *Infectious Diseases*, Volume 2 of *Internal Medicine in World War II*, ed. Paul Havens Jr. (Washington, DC: Government Printing Office, 1963), 97.

<sup>160</sup> Sink, 80.

disease, often exceeding \$2,000.<sup>161</sup> For families in the 1940s, just a decade removed from the Great Depression, this was an unimaginable amount and could sentence the family to destitution.

Another aspect that struck fear into the hearts of Americans during the 1940s was the disease's unpredictability. Polio "tended to strike a whole community suddenly and unpredictably, leaving in its wake much malaise, crippling, and death."<sup>162</sup> This unpredictability stemmed from the public's lack of understanding of poliomyelitis. The knowledge of the disease had not evolved much from the days of the New York epidemic in 1916. Because of this, the public was unsure of how to react when polio struck, so many of them did what came naturally; they panicked.

Sometimes this panic affected essential services in a community. During the 1944 Kentucky epidemic, Louisville garbage collectors began to miss work for fear that they could contract the disease from the citizens' refuse. Eventually the situation got so bad that the Louisville Sanitation Department was forced to take drastic action. It appealed to the United States Employment Service "which put the occupation on the wartime 'must' list."<sup>163</sup> This list was designed to prohibit work stoppages during the war. Although this was not your typical work stoppage, the garbage collectors were forced to return to work.

The American military recognized how important the fight against polio on the home-front was to the war effort, and the various branches were dedicated to helping in any way they could. One way they did this was in lending a hand to local medical leaders in the midst of polio epidemics. These efforts were not limited to just the high-profile epidemics like the one in Hickory but also to smaller, relatively unknown outbreaks. A similar incident to the one in

---

<sup>161</sup> Berg, 155-6.

<sup>162</sup> Fred Davis *Passage Through Crisis: Polio Victims and Their Families* (Indianapolis: Bobbs-Merrill, 1963), 4.

<sup>163</sup> Michael Davis, 360-1.

Hickory took place in 1943 in Honolulu. An outbreak occurred, forcing the construction of a temporary polio hospital. To assist with this construction, the Hawaiian Department of the Army donated \$5,000 to the project and upon completion donated Army supplies and staffed the hospital with Army nurses.<sup>164</sup> This cooperation between the military and the NFIP set the stage for postwar treatment of a number of polio patients at military hospitals by a combination of civilian and military doctors.<sup>165</sup>

Another way the military helped in the fight against polio was to support the NFIP. The prevailing attitude of the Army high command was best summed up in the last year of the war by Surgeon General Norman T. Kirk when he said, “I trust that nothing shall be allowed to interfere with the magnificent battle which the National Foundation for Infantile Paralysis is waging against this enemy.”<sup>166</sup> Military support for the Foundation did not end with words either. Military installations joined with the American citizens and individual servicemen who contributed to the March of Dimes. For example, in 1945 the Atlanta Naval Air Station presented the NFIP’s local fund-raising campaign with a donation totaling \$1,022, quite a sizeable sum at that time.<sup>167</sup>

Polio also offered Americans a successful way to reach out to the international community during World War II. One intriguing case involved Alain Darlan, the twenty-nine year old son of the assassinated French admiral François Darlan. The younger Darlan was hospitalized after contracting polio in Algiers. When news of this reached the American shores, polio interest groups from all over raced to see who could cash in on this potential publicity boon. The Mayor of Minneapolis was the first to do just that when he sent an invitation for

---

<sup>164</sup> “Honolulu Erects Paralysis Hospital,” *New York Times*, May 2, 1943.

<sup>165</sup> Sass, 42-3.

<sup>166</sup> Norman T. Kirk in “Fighting Another Enemy,” *New York Times*, January 18, 1945.

<sup>167</sup> “Naval Air Station Donates \$1,022 to local Polio Drive,” *Atlanta Constitution*, 1-26-1945.

Darlan to be brought to the city's general hospital where he could be treated by the world's foremost expert in poliomyelitis after-care, Sister Elizabeth Kenny.<sup>168</sup>

Unfortunately for Minneapolis, but probably fortunately for Darlan, FDR took an interest in his case. Roosevelt reached out to the French to have Darlan brought to Warm Springs, so in early 1943, he was loaded on a ship and brought to the United States. Darlan arrived at Warm Springs with his wife and his mother.<sup>169</sup> Over the course of the next several years, the Frenchman underwent the most sophisticated treatment for polio in the world at Warm Springs. Eventually, after the war and his first marriage ended, Darlan fell in love with and married one of his Warm Springs physiotherapists.<sup>170</sup>

As we have seen, polio was still a highly misunderstood disease in the early 1940s. The scientific and medical communities were still grappling with several essential problems such as what caused the disease, how it was spread, and how to prevent it. An illustration of the depth of the problem facing polio researchers in the 1940s can be found in a letter to the editor of the *New York Times* from FDR's former physician George Draper dated 17 April 1942. In this letter, Dr. Draper states, "this malady is one of the most complex problems in medical biology and must still be investigated with clear-sighted and unremitting insistence."<sup>171</sup> For Draper, a scholar who had been studying the disease for close to thirty years, these words do not reflect confidence in the amount of knowledge that the scientific community possessed on the disease.

---

<sup>168</sup> "Hospital offers care to Darlan son, Polio Victim," *Chicago Daily Tribune*, November 18, 1942.

<sup>169</sup> "People" *Time Magazine*, May 29, 1943, <http://www.time.com/time/magazine/article/0,9171,933027,00.html> (Accessed 21 September 2011).

<sup>170</sup> "Milestones" *Time Magazine* December 9, 1946, <http://www.time.com/time/magazine/article/0,9171,793275,00.html> (Accessed September 21, 2011).

<sup>171</sup> George Draper. Letter to the Editor, *New York Times*, April 17, 1942.

Paul notes that during this period, beliefs about the prevention of polio were based solely on how individuals believed it was spread.<sup>172</sup> Since they were still unsure how the latter occurred, this posed a major problem. Despite this, scientists did have their favorite theories, most of them based on what Humphreys calls “reasoning through analogy.”<sup>173</sup> That is, researchers compared polio to other diseases, and if similarities were found, they noted the way the latter disease was spread and attributed this to polio.

One theory of polio’s mode of transmission involved the poliovirus being carried by the common house fly. This theory had its origin in the 1916 epidemic in New York, where the fly first came under suspicion. Historian Naomi Rogers notes that, at the time, the theory of insects as disease carriers served medical authorities’ desire to connect the role that filth played in the spread of disease with the ever-growing belief in the Germ Theory.<sup>174</sup> Transmission of polio via insects also fit with reasoning by analogy. Scientists had proven that diseases such as malaria and yellow fever were insect-borne, so it stood to reason polio could be as well. The fly theory regained prominence just prior to the outbreak of World War II when famed polio scientists Albert B. Sabin and Robert Ward reported that their findings suggested that flies were the cause of the spread of polio in warm weather epidemics.<sup>175</sup>

When the epidemic in North Carolina occurred in 1944, Yale sent members of its poliomyelitis commission to Hickory to study the outbreak. These scientists made the discovery that flies could infect food with poliovirus and by doing so spread the disease.<sup>176</sup> Due to these findings, contemporary efforts to combat the spread of polio revolved around attempts at insect

---

<sup>172</sup> Paul, *A History of Poliomyelitis*, 247.

<sup>173</sup> Margaret Humphreys, *Yellow Fever and the South* (Baltimore: Johns Hopkins University Press, 1992), 39.

<sup>174</sup> Rogers, *Dirt and Disease*, 18-9.

<sup>175</sup> “2 Doctors Blame Flies for Warm Weather Polio,” *Atlanta Constitution*, December 20, 1941.

<sup>176</sup> Berg, 111-3.

control. These were the intentions behind the 1945 Army DDT trials during the Rockford Epidemic.

Another common misconception of the disease that had to be overcome during World War II was that polio was a respiratory disease. The fact that polio was believed to be contracted in this manner is a testament to the continued influence of Flexner and the complete lack of understanding that his method of study provided him. Flexner reasoned that since the Rhesus monkeys could contract polio through the nose and not through the digestive system, humans must be infected in the same way. Unfortunately, this theory did not take into account that these monkeys' digestive systems differed in any way from a human's.

Flexner's belief led directly to the search during the 1930s for a chemical blockade that could be applied to noses to prevent the infection of polio.<sup>177</sup> Several versions of such a nasal spray were created, and in a 1936 outbreak in Alabama, several of them were put to the test. The findings suggested that these blockades had absolutely no effect on the virus whatsoever, but unfortunately for hundreds of other Americans, the test was carried out in such an unscientific way that the results were completely ignored.<sup>178</sup> Such chemical blockades were still being touted as the "Best Hope of Preventing Polio," as late as 1938.<sup>179</sup> While this method of prevention eventually went out of vogue, the concept of polio as a respiratory disease held on in some circles throughout World War II.

Eventually, the scientific community was able to cast off the theories of Flexner which allowed them to discover the truth about how poliovirus invaded the human body. That is, through the digestive system. This theory had its root in 1912, when two Swedish doctors

---

<sup>177</sup> Oshinsky, 125.

<sup>178</sup> Berg, 76-7.

<sup>179</sup> "Nasal Spraying Seems Best Hope of Preventing Polio," *The Science News-Letter* 33, no. 3 (January 15, 1938): 36, JSTOR.

claimed to have discovered polio in the gastro-intestinal tract of patients.<sup>180</sup> Unfortunately these findings were ignored for several decades. Then, in 1934, Dr. John A. Toomey reported that he believed that the virus entered through the digestive tract.<sup>181</sup> Toomey's theory also did not garner much support because of the remaining influence of Flexner.

These earlier discoveries did not stop several scientists from taking credit for formulating the accepted alimentary tract theory of poliovirus infection. Paul claims that in 1937 the Yale Poliomyelitis Commission discovered that the virus multiplied in the digestive system and that human feces were more than likely the mode of transmission.<sup>182</sup> Meanwhile, Oshinsky reports that David Bodian and Howard Howe determined the alimentary canal to be the route of entry in 1941.<sup>183</sup> Whatever the case, Sabin reports that by the early 1940s, it had become apparent that polio was not a respiratory disease but rather it was a disease of the alimentary tract which was spread through human feces.<sup>184</sup>

The scientific and medical communities' lack of knowledge about how polio was spread between victims had a major impact on the public health measures they employed during outbreaks. One method that was favored up through the 1950s was that of quarantine. Evidence of public health measures calling for the quarantine of both the victims of an infectious disease as well as the cities where epidemics were occurring can be found as far back as Renaissance Italy where it was a common practice to use quarantines to combat the spread of the plague.<sup>185</sup>

---

<sup>180</sup> Berg, 84-5.

<sup>181</sup> "Polio' Germ May Enter Body Through Stomach," *The Science News-Letter* 25, no. 680 (April 21, 1934): 245, JSTOR.

<sup>182</sup> Paul, *A History of Poliomyelitis*, 280-2.

<sup>183</sup> Oshinsky, 130.

<sup>184</sup> Albert B. Sabin, "Poliomyelitis" in *Communicable Diseases: Transmitted Through Contact or by Unknown Means*, Volume 5 in *Preventive Medicine in World War II* (Washington, DC: Government Printing Office, 1960), 370-1.

<sup>185</sup> Ann G. Carmichael, *Plague and the Poor in Renaissance Florence* (Cambridge: Cambridge University Press, 1986), 25, 110-6.

The practice was first used on a large scale in response to an epidemic of polio in the New York Epidemic of 1916.

In the New York epidemic, entire households in which a family member was suspected to be suffering from polio were quarantined, while the travel of all New York residents was restricted.<sup>186</sup> This practice was continued in the 1940s. During a 1943 outbreak in a Japanese-American relocation center at Poston, Arizona, the occupants of the camp were quarantined inside the camp itself and not allowed to go into the city.<sup>187</sup> The following year, during the North Carolina epidemic, any child traveling into the state of South Carolina from its neighbor to the north could be subjected to quarantine.<sup>188</sup> Other states pursued similar courses of actions. The State of Georgia even went so far as to quarantine its own resident children who had traveled to North Carolina to attend summer camp. These children were allowed to return home but were mandated to be quarantined for twenty-one days.<sup>189</sup>

Another aspect of polio in which advances were slow to come was in the treatment of patients. Scientists had devised methods that could successfully treat the victims of other diseases, but try as they may, they could not do the same for polio. Once again, Flexner proposed a theory that shaped the polio research on this matter for the next several decades, until it was finally accepted to be flawed. One of Flexner's first jobs at the Rockefeller Institute was to develop a serum to fight a meningitis outbreak in 1909. This serum was made from the blood of patients who had survived cases of meningitis and had subsequently developed immunity to the disease. An injection of this serum could then be given to a victim of meningitis to help his/her immune system more effectively combat the disease. Flexner, using the designs of other

---

<sup>186</sup> Paul, *A History of Poliomyelitis*, 149; and Rogers, *Dirt and Disease*, 37-9.

<sup>187</sup> "Hospital Provided for Japs at Poston," *Los Angeles Times*, June 11, 1943.

<sup>188</sup> Sink, 50.

<sup>189</sup> "Georgia to Quarantine Polio Area Headquarters," *Atlanta Constitution*, July 13, 1944.

scientists, engineered the serum to be highly effective and began employing it. The results were phenomenal; the death rate during the outbreak was significantly lower than it would have been without the serum.<sup>190</sup>

Because of this background, Flexner began to believe that a similar serum could be developed to help treat polio patients. In this case, the serum was derived from patients who were recovering from the acute stage of the disease. The proposed benefits of this convalescent serum were two-fold. First, it was hoped that the serum could provide immunity to individuals prior to contracting the disease. Furthermore, it was believed to provide a therapeutic remedy for those in the first stages of a polio infection.<sup>191</sup> What sounded good in theory proved to be less than effective in reality. Providing the serum to patients ultimately proved to have absolutely no benefits whatsoever.

The question is, when did the medical community realize convalescent serum was worthless? The historian Volney Steele argues that doctors realized this fairly quickly in the 1920s.<sup>192</sup> Gould disagrees; he claims that “the debate over the use of immune serum would not be resolved until the mid-thirties, when a properly controlled experiment found no evidence to support its therapeutic value.”<sup>193</sup> Finally, Dr. Richard Owen argues that the serum was used as late as 1940.<sup>194</sup>

Despite these claims, during the two major Illinois epidemics occurring in the first half of the 1940s, the *Chicago Daily Tribune* ran articles requesting that Illinois citizens who had

---

<sup>190</sup> John M. Barry, *The Great Influenza: the Epic Story of the Deadliest Plague in History* (New York: Penguin, 2004), 75-6.

<sup>191</sup> Paul, *A History of Poliomyelitis*, 190.

<sup>192</sup> Steele, 73.

<sup>193</sup> Gould, 22.

<sup>194</sup> Richard Owen in Sass, 30.

recovered from polio donate blood for the production of serum.<sup>195</sup> These articles suggest that the concept of convalescent serum may have gone out of vogue with professional polio researchers much earlier, but there were still portions of the population who believed in its use to treat polio victims, even as late as the war years.

The treatment of American polio victims got a major boost on 14 April 1940 when an elderly Australian nurse stepped off a boat in Los Angeles, California.<sup>196</sup> Out-spoken, controversial, and indomitable, Sister Elizabeth Kenny forever changed the way doctors approached the treatment of polio patients. However, in 1940 she was still relatively unknown in America and almost wholly ignored in Australia. This was about to change.

Sister Kenny had absolutely no connection to formal religion. The title Sister came instead from her rank, the equivalent of a First Lieutenant, in the Australian military, in which she served during World War I. She also had no formal nursing training. Her knowledge of the musculoskeletal system came from helping her younger brother Bill who was perpetually undersized in training and building his muscles.<sup>197</sup>

In the early twentieth century, Kenny took a job as a bush nurse, to respond to the lack of medical care that existed in the back-country of Queensland.<sup>198</sup> It was while doing this that Kenny first encountered a case of polio in June 1911.<sup>199</sup> Unfamiliar with the disease, Kenny sent a telegraph to her mentor Dr. Aeneas McDonnell asking for advice. Kenny reports that

---

<sup>195</sup> “Ask Recovered Polio Victims to give Blood,” *Chicago Daily Tribune*, August 21, 1943 & “Polio Survivors Asked to Give Blood to Clinic,” *Chicago Daily Tribune*, August 27, 1945.

<sup>196</sup> Elizabeth Kenny and Martha Ostenso, *And They Shall Walk* (New York: Dodd, Mead, & Company, 1943), 203; and Victor Cohn, *Sister Kenny: the Woman Who Challenged the Doctors* (Minneapolis: University of Minnesota Press, 1975), 3.

<sup>197</sup> Kenny & Ostenso, ix 12; Cohn, *Sister Kenny*, 7, 36-7, & 58.

<sup>198</sup> Cohn, *Sister Kenny*, 38.

<sup>199</sup> The case was in a local two year old girl; Cohn, *Sister Kenny*, 40-1.

McDonnell responded “Infantile Paralysis. No known treatment. Do the best you can with the symptoms presenting themselves.”<sup>200</sup>

On the advice of McDonnell, Kenny did what she thought was best, which was to treat the major symptom, muscle pain, with heat therapy. After she tried several unsuccessful methods to harness the healing power of heat she finally stumbled upon one that worked. “At last I tore a blanket made from soft Australian wool into suitable strips and wringing them out of boiling water. These I wrapped gently about the poor, tortured muscles. The whimpering of the child ceased almost immediately, and after a few more applications her eyes closed slowly and she fell asleep.”<sup>201</sup> An early form of the Kenny method had been created.

If Sister Kenny had received formal nursing training, she would have realized that her method for treating the disease flew in the face of all contemporary medical knowledge. So in effect, it was precisely this lack of training that allowed her to revolutionize the treatment of polio. Over the course of the next several decades, Kenny perfected her method that revolved around the use of this moist heat.

The Kenny method was created to combat what she erroneously believed to be the most damaging symptom of polio, “spasm”. According to Sister Kenny, it was spasm that forced the patients’ muscles to contract, causing pain, lack of motion, and deformities. To combat spasm, hot fomentations, otherwise known as hot packs consisting of woolen strips soaked in hot water, were applied to the affected muscles to relieve pain. Following this, therapists trained in the Kenny method conducted passive range-of-motion exercises to help retrain the patient’s muscles. Finally, Kenny stipulated that patients be placed in a bed with their feet up against a board installed at its end. Such a position ensured that the patient’s muscles contracted the way they

---

<sup>200</sup> Aeneas McDonnell in Kenny & Ostenso, 23.

<sup>201</sup> Elizabeth Kenny quoted in Kenny & Ostenso, 24.

should when standing; it also helped keep the patient from developing deformities in their legs.<sup>202</sup>

The Kenny method contradicted the accepted beliefs of the medical community. Until the 1940s, doctors relied on immobilization to keep polio patients from developing the deformities that often accompanied the disease. Immobilization of a patient was accomplished by splinting the affected muscles or putting a series of casts on the patient in the belief that this allowed the muscles to rest and eventually heal. Kenny argued that such practices actually facilitated the development of deformities rather than prohibiting it.<sup>203</sup>

After arriving in the United States, Sister Kenny went straight to the top of the polio hierarchy in the United States, meeting with O'Connor and Gudakunst in New York. Unfortunately for Kenny, the directors of the NFIP told her that they were not in the business of giving money directly to individuals but rather to research institutions.<sup>204</sup> If Sister Kenny wanted to have her method funded by the Foundation, she had to find an institution that was interested in working with her. With this in mind she traveled to Rochester, Minnesota.

The purpose of Kenny's visit to Minnesota was a meeting with Melvin Henderson at the Mayo Clinic to discuss the adoption of her method. Dr. Henderson informed her that there was nothing he could do for her as the clinic was not currently treating any polio patients. However, if Kenny wanted to travel to St. Paul, she might find some cases with which to demonstrate her treatment. She did and eventually was allowed to set up a polio ward in Minneapolis General Hospital.<sup>205</sup>

---

<sup>202</sup> Elizabeth Kenny, *The Treatment of Infantile Paralysis in the Acute Stage* (Minneapolis: Bruce Publishing, 1941), xv-i, 57, & 64-5; Cohn, *Sister Kenny*, 253; Black, 88.

<sup>203</sup> Kenny, 20 & 27-8.

<sup>204</sup> Kenny & Ostenson, 211.

<sup>205</sup> Kenny & Ostenson, 211 & 217-21; Cohn, *Sister Kenny*, 132-3.

Now that Sister Kenny had a base of operations, she just had to wait for the American medical community to accept her ideas. The first step to this end occurred in December 1941, as the United States was propelled into World War II, when the Medical Committee of the NFIP met and agreed that Kenny's beliefs about the treatment of polio were correct. The committee also set up several training courses at the University of Minnesota to instruct medical personnel on how to successfully apply the Kenny method to their polio cases.<sup>206</sup> Over the course of the war, the NFIP trained scores of physical therapists who "turned out to be a vitally needed corps when the injuries of World War II finally made the medical world conscious of the need for rehabilitation."<sup>207</sup>

From this point, the Kenny method ascended to acceptance at lightning speed. Almost overnight, the American medical community discarded their splints for hot packs. The staff at Warm Springs, perpetually in the vanguard on polio treatment developments, got their first glimpse of the Kenny method when a delegation from the center attended a speech given by Sister Kenny at the convention of the American Physiotherapy Association.<sup>208</sup> In less than a year, Dr. Bennett was reporting that the Kenny method "in skilled hands is better able than any of our traditional methods to salvage all remaining neuro-muscular units not destroyed by the virus, and place these units under efficient and coordinated voluntary control."<sup>209</sup> By the end of the war, nearly all treatment methods being used within the United States were based primarily on the Kenny method.<sup>210</sup>

---

<sup>206</sup> Kenny & Ostenso, 246-7.

<sup>207</sup> Cohn, *Sister Kenny*, 151.

<sup>208</sup> Kenny & Ostenso, 229.

<sup>209</sup> Robert L. Bennett quoted in "Kenny Method for Paralysis Basic, Not Cure, Georgian Says," *Atlanta Constitution*, November 13, 1942.

<sup>210</sup> Berg, 160.

Such widespread acceptance of the Kenny method was certainly a boon to American polio patients who were finally receiving the sort of systemized and effective treatment that they needed. However, it did cause one drastic if unforeseen problem. The use of Kenny's hot packs required appliances to provide the moist heat. Unfortunately, the needs of the war industry had forced a ban to be placed on the manufacturing of home laundry equipment so that factories could focus their effort on the production of war material. In May 1942, as the need for washing machines to be used in conjunction with the Kenny method became acute, the War Production Board had to lift the ban on the production of such equipment so that the Electric Household Utilities Company could manufacture the needed machines.<sup>211</sup> With these machines on hand, the country's medical centers were ready to treat the growing number of polio patients.

The American polio experience in the early 1940s can be characterized by growing incidence rates, more frequent and larger epidemics, and a growing public fear associated with the disease. Meanwhile, the scientific and medical communities were still struggling with the glaring holes in their knowledge about the malady. In order to facilitate the filling in of these gaps in knowledge and to help meet the needs of the expanding population of polio patients, the National Foundation had to grow and adapt to the changes in American society brought about by the war. Despite these setbacks, the application of the Kenny method resulted in a tremendous improvement in the treatment of polio patients during World War II, not only for civilian patients but also for those in the military as well.

---

<sup>211</sup> "WPB Authorizes output of 50 washers to Treat Infantile Paralysis," *Wall Street Journal*, September 11, 1943.

## CHAPTER 3

### THE SERVICES

The chances of William Bryant catching polio in the European Theater of Operations (ETO) were extremely small. Up to October 1944, only fourteen official cases of polio among American troops had been reported. Despite such a low number of cases, however, small outbreaks were beginning to occur more frequently. Bryant was one of ten cases reported for the month of October; a number not surpassed in this theater until July 1945, when fifteen new cases were reported. He was also one of just forty-nine American servicemen who contracted polio in the ETO during the war, giving the theater an admission rate of just .01 per 1,000 average troop strength. The European Theater was simply not the type of environment that led to US troops contracting polio during World War II.<sup>212</sup>

Although poliomyelitis was not a particularly serious issue for American forces in Europe, the disease did create a number of issues for the military as a whole. Domestic outbreaks of polio threatened the lives and training of military recruits. In some theaters, such as Africa and the Middle East, the Mediterranean, China-Burma-India (CBI), and the Philippines, serious polio outbreaks occurred. Polio also proved to be a very costly military disease, killing nearly twenty-two percent of all diagnosed cases and leaving most of the remaining individuals to undergo long and expensive recoveries paid for by the military. Most of these survivors were eventually discharged to disability, their manpower having been lost to the armed forces for good.<sup>213</sup> Polio became a serious issue for the American military during World War II.

---

<sup>212</sup>Frank A. Reister, *Medical Statistics in World War II* (Washington, DC: Government Printing Office, 1975), Table 30a, 538-9; Table 43c, 804-5; Table 44c, 826-7; & Table 45c, 848-9.

<sup>213</sup>Reister, 30.

When the Americans entered World War II, military medical officials were almost wholly unprepared to deal with polio as a military disease. For the most part, this stemmed from their belief that polio was not in fact a disease with any ramifications on military forces.<sup>214</sup>

Historian David Oshinsky writes that this belief was even held by notable polio researcher Albert B. Sabin. While Sabin did not acknowledge the disease was a military problem, he did comment on the fact that American soldiers stationed in foreign countries seemed to be more susceptible than those countries' native peoples.<sup>215</sup>

The belief that polio was not a military disease reflected the lack of experience that military medical authorities had in dealing with the malady. Much of what the military knew about medicine stemmed from World War I. It was during this conflict that modern military medicine was born. In the case of polio, such reliance on the lessons learned during the previous war put military medical authorities at a disadvantage. During World War I, the American military had experienced only eighty-one cases of polio. Famed polio researcher John R. Paul claims that it was due to this small number that medical authorities had completely dismissed poliomyelitis as a military disease.<sup>216</sup>

Despite the growing frequency of polio and the rising average age of its victims during the interwar years, military medical authorities held onto the belief that the malady did not pose a threat to the military's manpower. Such recalcitrance was not unique to polio; the medical departments of the Army and the Navy "did not keep up with the developments of the interwar

---

<sup>214</sup> John R. Paul, "Neurotropic Virus Diseases," chapter 4 in *Infectious Diseases*, volume 2 of *Internal Medicine in World War II*, Ed. W. Paul Havens Jr. (Washington, DC: Government Printing Office, 1963), 91.

<sup>215</sup> David M. Oshinsky, *Polio: an American Story*. Oxford: Oxford University Press, 2005), 144.

<sup>216</sup> Albert E. Cowdrey, *Fighting for Life: American Military Medicine in World War II* (New York: MacMillan, 1994). 6-7; Albert B. Sabin, "Poliomyelitis" chapter 15 in *Communicable Diseases: Transmitted Through Contact or by Unknown Means*, Volume 5 in *Preventive Medicine in World War II* (Washington, DC: Government Printing Office, 1960), 367; Paul "Neurotropic Virus Diseases", 91.

years.”<sup>217</sup> Instead, like the rest of the Armed Forces, these departments suffered neglect at the hands of the American isolationists who advocated reducing defense spending as a tactic to keep America from becoming embroiled in another foreign war. Because of this inability to keep up with scientific and medical advances, the military was unable to fully understand polio and prepare for the wide-scale treatment of its victims.

Had the military been more aware of the changes occurring in the pattern of epidemic polio, it might have realized an ominous development in its own backyard. In 1934, a small outbreak of polio occurred among servicemen and their families stationed in Manila, Philippines. In this outbreak, seventeen individuals contracted polio, with three of these being GIs.<sup>218</sup> This outbreak brought to light a serious issue. The outpost’s ranking officer Lieutenant Colonel Charles C. Hillman noted that “the incidence rate, even in the civilian population, was much greater for Americans than for the Filipinos.”<sup>219</sup> Clearly, the Americans were more susceptible than the natives, a fact that did not bode well for the American personnel stationed in similar locations in the next decade. The lessons that this outbreak offered were not heeded by medical authorities.

That the military medical departments were unprepared to deal with polio was also a testament to the continuing paucity of knowledge about the disease. Writing in 1943, Rear Admiral Charles M. Oman of the Navy Medical Corps said of filterable viruses like polio, “So far we know little about them, [and] we have, as yet, no adequate means of preventing their effects on the human being.”<sup>220</sup> C.C. Allard of the *Arkansas Democrat Magazine* seconded this

---

<sup>217</sup> Mary Ellen Condon-Rall and Albert E. Cowdrey, *The Medical Department: Medical Service in the War Against Japan* (Washington, DC: Government Printing Office, 1998), 4.

<sup>218</sup> Sabin, 368 & Paul “Neotropic Virus Diseases,” 93.

<sup>219</sup> Sabin, 369-70.

<sup>220</sup> Charles M. Oman, *Doctors Aweigh: The Story of the United States Navy Medical Corps in Action* (Washington, DC: Government Printing Office, 1969), 143.

in his 17 June 1945 article by claiming “[polio] still presents many unsolved problems as to specific therapy [...] and is the subject of continuing research and study on the part of the [Army and Navy General Hospital] medical staff.”<sup>221</sup> Clearly scientists and medical researchers still had a very scant knowledge about the disease in the 1940s.<sup>222</sup>

If knowledge of the disease was poor outside of the military, it was even worse within it. On an official Statistical Health Report form number 86ab, used by Army units in 1944, poliomyelitis is listed as a miscellaneous disease, suggesting that the medical authorities that prepared the form were unsure of the disease’s mode of transmission. Furthermore, despite the 1934 outbreak in Manila, the military still did not view polio as a tropical disease. Paul suggests that this belief was based on the low incidence rates among native populations. What officials failed to realize was that these populations had developed immunity to the disease in infancy.<sup>223</sup> Such lack of understanding led the military to be surprised by large outbreaks of the disease in World War II.

Military officials were also slow in acknowledging that polio was not in fact a disease that primarily affected the respiratory system. The US Army’s “Basic Field Manual for Military Sanitation and First Aid”, issued in 1940, listed polio as a respiratory disease. The manual suggested that to control polio, the Army needed to ensure proper ventilation, prevent overcrowding, enforce cleanliness, and quarantine anyone who contracted the disease and any individuals with whom they had come in contact. According to Sabin, this view was abandoned the following year as the Army finally accepted that the disease spread through human sewage.

---

<sup>221</sup> C. C. Allard, “Wounded and Ill Vets Find Haven at Spa,” *Arkansas Democrat Magazine*, June 17, 1945, 4.

<sup>222</sup> Michael W. R. Davis, “Kentucky’s 1944 Polio Epidemic,” *Filson Club History Quarterly* 74, (2000): 353.

<sup>223</sup> Statistical Health Reports, Compiled on SF 86ab, ARC ID 3281856, National Archives II, National Archives and Records Administration, College Park, MD; Paul “Neurotropic Virus Diseases,” 93-5.

While this was probably true for the highest ranking medical officials, a different version of the Statistical Health Report form 86ab used by the Army during the last years of World War II continued to list polio as a “disease transmitted by the discharge of the respiratory tract.”<sup>224</sup>

Another area in which the military was slow in realizing the shifting patterns of polio infections was in the rising average age of polio victims. The military still viewed polio as a childhood disease. Since World War I, a major shift had taken place; older children, teenagers, and young adults had become much more likely to contract polio. By 1940, one “quarter of the new cases involve[d] a victim between age ten and nineteen.”<sup>225</sup> These statistics show that more and more individuals were reaching military age without having had contact with the virus and because of this they had not developed immunity to it. Meanwhile, the military seemed oblivious to this trend. “As late as 1941 military medical authorities had not only been almost completely unaware of the change but when informed, they refused to believe it.”<sup>226</sup>

Such a refusal to accept the situation on the part of military medical authorities was unfortunate because polio had become a disease that was to pose a serious and unique problem for the American military in World War II. During the war, “the degree of crippling was high; the percentage of bulbar cases was high; the mortality was high; and the element of panic which poliomyelitis caused, either in outbreaks or in single cases within military units, had proved to be appreciable.”<sup>227</sup> It was time the medical departments took note.

The only person who seemed to have anticipated such a result was Franklin Roosevelt. In his extemporaneous remarks to the Warm Springs staff on 15 April 1943, Roosevelt stated “here

---

<sup>224</sup>War Department, “Basic Field Manual: Military Sanitation and First Aid,” 31 July 1940, US Army Heritage Collections Online, <http://www.ahco.army.mil/site/index.jsp>, s.v. “poliomyelitis” (Accessed 24 June 2011), 13-20; Sabin, 371; Statistical Health Reports,.

<sup>225</sup> Oshinsky, 162.

<sup>226</sup> Paul “Neurotropic Virus Disease” 91; Alton L. Blakeslee, *Polio and the Salk Vaccine: What you Should Know About It* (New York: Grosset & Dunlap, 1956), 53; Quotation from John R. Paul, *A History of Poliomyelitis* (New Haven: Yale University Press, 1971), 346.

<sup>227</sup> Paul “Neurotropic Virus Diseases” 91.

at Warm Springs we are going to have, in the days to come, a great many more men in uniform. After all, infantile paralysis is not a respecter of age; and in the Army, Navy, Marine Corps, and Coast Guard, including WAACs, WAVEs, and other girls, we are going to have, out of more than seven million Americans, a good many cases of infantile paralysis.”<sup>228</sup> As a result, he told his audience Warm Springs had to prepare to do everything it could to meet the coming demand and provide the best possible treatment to these GIs.

Roosevelt’s assertion proved to be accurate. The American military experienced over 1,000 cases of polio during World War II. Many of these cases resulted directly from an increased susceptibility of the new generation of soldiers. These men and women who had never developed immunity to the disease were then introduced into infectious environments, and predictably high rates of polio resulted.<sup>229</sup>

Military life also likely made soldiers more susceptible to polio. Research suggests that high levels of stress and fatigue were strong determinants in whether or not an individual contracted polio and also in the severity of the infection.<sup>230</sup> Military life, especially in a theater of combat, is an inherently stressful and tiring situation. Famed war correspondent Ernie Pyle wrote that the American infantry of World War II “[reached] a stage of exhaustion that is incomprehensible to folks back home.”<sup>231</sup> It is no surprise then that these soldiers’ immune systems were at a severe disadvantage in fighting off the poliovirus.

As the military medical authorities came to accept the threat posed to troops by polio, they realized the need to control it. In all wars, the control of disease is a primary goal. Virologist

---

<sup>228</sup> Franklin D. Roosevelt, Extemporaneous Remarks of the President at Warm Springs Foundation, April 15, 1943, National Archives and Records Administration, <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>, s.v. “polio” (Accessed 24 June 2011).

<sup>229</sup> Paul “Neurotropic Virus Diseases,” 91-92 & 95.

<sup>230</sup> Oshinsky, 27; C. H. Stuart-Harris, “Viruses of Human Diseases,” *British Medical Journal* 1, no. 5295 (June 30, 1962): 1782, JSTOR.

<sup>231</sup> Ernie Pyle, *Brave Men* (New York: Henry Holt and Company, 1944), 84.

Hans Zinsser wrote in 1935 that “war is to-day, as much as ever, 75 percent an engineering and sanitary problem and a little less than 25 percent a military one. Other things being approximately equal, that army will win which has the best engineering and sanitary services.”<sup>232</sup> While this is certainly a bit of an overstatement, it does illustrate the important role that military medicine plays in conserving an army’s fighting strength.<sup>233</sup>

The first way that polio could reduce this fighting strength is through its ability to kill its victims. In civilian life, those who contracted polio were highly unlikely to die from the disease. During World War II, the American military experienced a completely different trend. More than one-fifth of the 1,023 cases of polio in the US Army resulted in death. Such a high mortality rate had to have been a serious concern for military authorities. When compared with other highly publicized diseases, the picture looks even worse. Malaria only killed .1 percent of all its victims and dengue fever did not even kill that high a proportion. Of all admissions for disease throughout the war, only .1 percent resulted in death. In this regard, polio was definitely a disease with which the medical departments had to reckon.<sup>234</sup>

Even if a GI is not killed by a disease, such maladies can still affect troop strength. Armies understand that losing men, even temporarily to hospitals, reduces the number of troops available to serve on the front lines. In World War II, twenty percent of all disease admissions were caused by infectious and parasitic diseases, a category in which polio was classified. This made these diseases the second largest source of disease admissions during the war. Among this group, polio had a much higher average number of days lost per admission than any other

---

<sup>232</sup> Hans Zinsser, *Rats, Lice, and History* (New York: Bantam, 1935), 98 n.

<sup>233</sup> Cowdrey, 3.

<sup>234</sup> Reister, Table 38, 714-5.

disease caused by a filterable virus. For the war this equated to an average 209 days lost per admission.<sup>235</sup>

When a soldier was admitted to the hospital with a case of polio, the loss to the military did not end with the absence of the soldier for such an extended period of time. Polio treatment was also highly expensive and the military was responsible for the full cost of each victim's rehabilitation. While several cases certainly were a drop in the bucket to a military backed by the financial power of the United States Government, enough cases could cause the expenditure of resources that might better have been employed elsewhere in the war effort. Such spending hurt even more when, following the treatment, the soldier was still unable to return to the front.

Perhaps the most damaging aspect of polio in the eyes of the military was its ability permanently to paralyze its survivors. "From a military standpoint, the loss of a man through discharge for permanent disability is equally as significant as a loss by death."<sup>236</sup> Polio had a special knack for causing this. Four hundred twenty-seven servicemen who contracted polio were discharged for disability in the Army, meaning just under forty-two percent of all cases of polio resulted in discharge for disability in one branch of the Armed Forces alone. Compare this with malaria (1.1 percent of all cases), dengue fever (.1 percent of all cases), and scrub typhus, (5.4 percent of all cases), and once again the problems associated with polio become evident.<sup>237</sup>

Looked at another way, only thirty-four percent of all polio cases were eventually returned to duty. Meanwhile, almost ninety-four percent of all Army victims of all diseases during the war returned to duty. The Army was able to return 98.9 percent of all malaria cases and 99.9 percent of all dengue fever cases. The rate of scrub typhus returns stood at slightly more

---

<sup>235</sup> Reister, 26 & Table 28, 408-9.

<sup>236</sup> Ebbe Curtis Hoff ed., *Communicable Diseases*, volume 4 of *Preventive Medicine in World War II* (Washington, DC: Government Printing Office, 1958), 5.

<sup>237</sup> Reister, Table 38, 714-5.

than eighty-eight percent. Even sixty-one percent of all psychoneurosis cases were returned to duty. Such a low rate of recovery made polio one of the most serious military diseases of World War II, even if it was not one of the most common.

The first area that the military had to come to grips with polio was in the Zone of the Interior. It comes as no surprise that with the rising rates of domestic polio and large numbers of young recruits being transported all over the United States, the disease was a major threat to state-side training facilities. The first significant outbreak occurred near Fort Sam Houston in San Antonio, Texas in 1942. Only three of the victims of the epidemic were servicemen, one of these cases being fatal, but many more were members of servicemen's families. During the San Antonio outbreak, it became clear that polio affected the military whether or not its soldiers contracted the disease. The threat to family members was a significant blow to the morale of the troops, and these outbreaks were becoming much more frequent. For all of 1942, the Army experienced only fifty-one cases of polio in the Zone of the Interior with just three of these resulting in death. The Army was not as lucky in 1943.<sup>238</sup>

In August of that year, 310 members of a Specialty Training and Reassignment (STAR) unit were assigned to the University of Indiana in Bloomington from Pasadena College in California. Shortly after departing from Pasadena, several of these individuals began to exhibit polio-like symptoms. One member of the group developed bulbar polio and died in Colorado on August 18. Upon arriving in Bloomington, eight more individuals were diagnosed with polio,

---

<sup>238</sup>Sabin, 376-7; Heather Green Wooten, *The Polio Years in Texas: Battling a Terrifying Unknown* (College Station: Texas A&M University Press, 2009), 59; Paul, "Neurotropic Virus Diseases," 96-7; Reister, Table 46a, 866-7 & Table 51a, 976-7.

and the entire STAR group was quarantined. Due to fears of a larger outbreak affecting the student body, the University decided to delay its fall term until the outbreak had subsided.<sup>239</sup>

At the same time of the outbreak among STAR personnel in Indiana, another outbreak was occurring in New Haven, Connecticut. While no recruits contracted polio in this epidemic, it concerned the military enough to revoke over 2,000 weekend-leaves for Navy and Marine Corps trainees stationed at Yale University.<sup>240</sup> Such preventive measures were common-place for military establishments located in the United States.

The remainder of 1943 witnessed sporadic outbreaks continuing to pop up among military personnel at an alarming rate. During the summer, two cases of polio were reported at both the Army Specialized Training Program (ASTP) at the University of California in Los Angeles and its counterpart at the University of Oregon. In September, another fourteen cases were diagnosed at a different educational institution on the west coast. The total number of polio infections in the Army for the year were as high as 200 with thirty deaths.<sup>241</sup>

Although 1944 proved to be the worst year for polio in the United States since 1916, the year brought fewer new cases of polio to the military units still stationed in the Zone of the Interior. Only 125 cases of polio were reported for 1944, with twenty-four fatalities.<sup>242</sup> The decline in cases can surely be attributed to the reduction of the number of personnel remaining in the United States that accompanied the escalation of the war. Despite this, 1944 still held a number of notable polio outbreaks.

---

<sup>239</sup> Paul, "Neurotropic Virus Diseases" 97; Sabin, 377; "Polio in Army Unit Will Delay Indiana U Term," *Chicago Daily Tribune*, August 23, 1943.

<sup>240</sup> "Polio in Army Unit Will Delay Indian U Term," *Chicago Daily Tribune*, August 23, 1943.

<sup>241</sup> Sabin, 379; David M. Goldstein, W. MCD. Hammon, and Henry R. Viets, "An Outbreak of Polioencephalitis Among Navy Cadets, Possibly Food Borne," *Journal of the American Medical Association* 131, no. 7 (June 15, 1946): 569; Reister, Table 42a, 778-9 & Table 52a, 998-9.

<sup>242</sup> Reister, Table 43a, 800-1 & Table 53a, 1020-1.

One such outbreak occurred in May at Occidental College in Los Angeles. Twenty-three cases were confirmed among students at the college. Some of the victims were civilians, while others were trainees in the Navy's v-12 program.<sup>243</sup> The fraternization between civilian and military personnel at America's universities seems to have exacerbated the chances of large outbreaks occurring.

As outbreaks of polio became more frequent, the military and civilian authorities began working together to try to control the spread of the disease. In cases like the outbreak among the STAR personnel, military units were often quarantined after an outbreak occurred among their ranks in order to keep the disease from spreading to the civilian population. A similar situation occurred among a "student training reserve program at Davidson College" near Charlotte, North Carolina in July 1944. When two army cadets were diagnosed with polio, the entire group, 225 in all, was quarantined.<sup>244</sup>

As seen in the response to the New Haven epidemic in 1943, in the face of large outbreaks, the military also had to take measures to protect its personnel from infected civilians. In August 1944, an epidemic was raging in and around Maryland. This situation forced many military bases located in the state to take precautionary measures to ensure the health and safety of their servicemen. The Bainbridge Naval Academy banned all visitors and prohibited anyone other than recruits from using the training swimming pools. Meanwhile, troops stationed at Holabird Signal Depot were told to refrain from visiting any locations where cases of polio had been diagnosed. Finally, troop transport trains in the Third Service Command were rerouted to

---

<sup>243</sup> "Navy Student Dies Here of Poliomyelitis," *Los Angeles Times*, May 26, 1944; Sabin, 386.

<sup>244</sup> Alice E. Sink, *The Grit Behind the Miracle: A True Story of the Determination and Hard Work Behind an Emergency Infantile Paralysis Hospital, 1944-45, Hickory, North Carolina*. (Lanham: University Press of America, 1998), 51.

avoid towns, and in the cases that this was unavoidable, GIs were instructed not to leave their train-cars for any reason.<sup>245</sup>

Perhaps the most well-known outbreak that occurred in 1944 was one at the US Naval Receiving Station in Portland, Oregon. This outbreak, stretching from October to November, included seventeen cases, eleven of which were paralytic, and four fatal. The reason that the Portland outbreak is so important is not the number of cases but instead the way the disease was spread. Investigators concluded that these individuals had contracted the poliovirus through contaminated milk that had been served at the station; it was one of two outbreaks among servicemen thought to have been spread in this fashion.<sup>246</sup>

The last year of the war also witnessed one of the most unusual outbreaks of polio occurring among servicemen in the Zone of the Interior. The Fort McClellan outbreak occurred at the isolated army post in hilly and forested northwestern Alabama. At the time, Fort McClellan was used as a training center for infantry replacements and was home to close to 30,000 soldiers. In early April, seventeen GIs were diagnosed with polio, ten of these experienced bulbar symptoms, and three died. All but four of these victims were younger than twenty years old. Fort authorities, fearing the disease could wreak havoc at such a large facility, quarantined fully one-third of all of the units that were stationed there. The Fort McClellan incident has the distinction of being the only outbreak to occur at an isolated Army camp in the Zone of the Interior during World War II.<sup>247</sup>

---

<sup>245</sup> "Md. Military posts take precautions," *The Washington Post*, August 23, 1944.

<sup>246</sup> Sabin, 384-6; Frank P. Matthews "Poliomyelitis Epidemic, Possibly Milk-Borne, In a Naval Station, Portland, Oregon," *The American Journal of Hygiene* 49, no. 1 (January 1949): 1; Paul, *A History of Poliomyelitis*, 180.

<sup>247</sup> "Polio Causes Fort Quarantine," *New York Times*, April 11, 1945; Paul "Neurotropic Virus Commission" 97; Sabin, 379-80; "Polio Quarantine at Fort McClellan," *Atlanta Constitution*, April 10, 1945.

Overall, polio in military units stationed in the United States was simply not as significant a problem as it proved to be in foreign theaters of war. Throughout the entire conflict, the Army in the Zone of the Interior experienced 446 cases of polio, a little under half of all Army cases for the entire war. Of these cases, nearly fourteen percent were fatal, a significantly smaller percentage than the Army experienced for all theaters throughout the war. Furthermore, the Army was able to return to duty forty-eight percent of all of its victims who contracted the disease in the Zone of the Interior, fourteen percentage points higher than the return rate in all of the theaters of war combined. Polio was simply a different disease when contracted outside of the United States.<sup>248</sup>

American military authorities were given a pretty serious warning about the threat that polio posed to servicemen during World War II in the experiences of British forces in the Middle East. British troops, like their American counterparts, had become susceptible to the disease because of their country's improved sanitation. Once these troops were transported to the Middle East, where sanitation was poor and polio endemic, their lack of immunity caused several major outbreaks to occur.

When polio first made its appearance in British Commonwealth forces in the Middle East, it was not immediately recognized because polio was not believed to be a disease of any importance among the native populations of the area. Eventually, a major epidemic broke out among New Zealand troops stationed in Egypt. In this epidemic, forty cases were diagnosed, and there were four deaths. Paul calls this incident the first polio epidemic ever among military personnel and the first epidemic to affect an all-adult population.<sup>249</sup>

---

<sup>248</sup> Reister, Table 28a, 430-1.

<sup>249</sup> Paul, *A History of Poliomyelitis*, 346-8; J. E. Caughey and W. M. Porteous, "An Epidemic of Poliomyelitis Occuring Among Troops in the Middle East," *The Medical Journal of Australia* 1 (1946): 5-6.

The investigators of the epidemic, J.E. Caughey, a Lieutenant Colonel in the New Zealand Medical Corps, and W. M. Porteous, a Major in the New Zealand Medical Corps, noted that not only did the outbreak occur among an all adult male population, but that it also had “the same case incidence and the same clinical and pathological features as epidemics affecting children and adults of both sexes.” The Egyptian epidemic stretched from November 1940 to July 1941, with all but two of the cases occurring within the city of Cairo. In reading the report from Caughey and Porteous, it becomes clear just how difficult it was for medical authorities, let alone military medical authorities, to diagnose cases of polio. In the Cairo epidemic, symptoms reported included headache, slight fever, sore throat, vomiting, and diarrhea. None of these symptoms are disease specific, and they could and did lead to several different diagnoses.<sup>250</sup>

It quickly became evident that the 1940 outbreak of polio was not an anomaly. In 1941, British troops experienced another major outbreak in the Middle East. For the year, seventy-four cases were diagnosed, and nineteen of them resulted in fatalities. Thirty-two more cases occurred during the following year, and fourteen of these proved fatal.<sup>251</sup> All of these outbreaks should have proved to American authorities that polio had evolved into a disease of military significance. It did not. Instead, it took US servicemen contracting the disease before the military began to pay attention.

Cases of polio started to occur in American forces shortly after they began to be deployed in overseas theaters. The bulk of these outbreaks occurred in areas that were densely populated and had poor sanitation. Polio also became more frequent with each passing year and the number of cases rose from eleven in the US Army in 1942 to 305 in 1945. Despite the low number of

---

<sup>250</sup> Caughey and Porteous, 5-7.

<sup>251</sup> C. E. Van Rooyen and A. P. Morgan, “Poliomyelitis: Experimental Work in Egypt,” *Edinburgh Medical Journal* 50 (1943): 705; John R. Paul, W. P. Havens, and C. E. Van Rooyen, “Poliomyelitis in British and American Troops in the Middle East: the Isolation of Virus from Human Faeces,” *British Medical Journal* 1, no. 4355 (June 24, 1944): 841.

cases during 1942, Paul states that during the first ten months of the war “the rate for the disease rose to more than ten times that recorded for soldiers of the same age in the United States.”

Overall, the Army experienced 577 overseas cases in four years of war.<sup>252</sup>

American troops proved to be especially at risk in foreign theaters. “When troops from a developed country occupy an area inhabited by a population with unsanitary habits where the environmental sanitation is primitive, military personnel are likely to suffer from a variety of infections common to the natives of that area.”<sup>253</sup> Polio certainly followed this trend, but the nature of the disease made it more difficult for medical authorities to accept. The fact that there was a lack of any significant cases of polio among native populations convinced medical authorities that their troops were not at risk.

A comparison between the Army’s experience with polio outside of the United States and its experience inside the United States further enhances the understanding of just how detrimental the disease proved to be in foreign theaters of war. Of the 577 cases in the Army in all overseas theaters, nearly twenty-eight percent ended in death, much higher than the domestic rate. Furthermore, only twenty-four percent were returned to duty, half of the return rate in the Zone of the Interior.<sup>254</sup>

The reason for the disparity in these rates undoubtedly lies in the victims’ access to quality medical care. In the Zone of the Interior, a serviceman who contracted polio did not have to wait very long to receive medical attention. In these foreign theaters, medical care could be much more difficult to receive and of inferior quality. Also, in cases of bulbar polio, a victim’s life depends on the availability of respirators. These respirators were few and far between in

---

<sup>252</sup> Paul, “Neurotropic Virus Disease,” 95; Quotation from Paul *A History of Poliomyelitis*, 350; Paul, Havens, Van Rooyen, 841; Reister, Table 28b, 452-3.

<sup>253</sup> Paul, *A History of Poliomyelitis*, 355.

<sup>254</sup> Reister, Table 38b, 722-3.

foreign theaters of war. Polio, especially if contracted outside of the United States, could be a very dangerous disease and was a significant waster of military manpower.

One of the first theaters to have a significant number of American cases of polio was that of Africa and the Middle East. This theater included Central Africa, West Africa, East Africa, Iran, and the Persian Gulf. Cases of polio began occurring here in the summer of 1943. For the year, the theater experienced fifteen cases of polio for an unheard of admission rate of .28 per 1,000 average troop strength. Seven of these cases resulted in death, which gave polio the most deaths of any disease in the theater for the year 1943. The experience of the US Army in the Africa and Middle East Theater proved to be quite similar to that of the British; unfortunately, military medical authorities had chosen to ignore that prior warning.<sup>255</sup>

It was after these initial outbreaks of polio that the United States military authorities finally began to take notice. The first attempt to study polio in the military was initiated by FDR who signed an executive order creating a Typhus Commission. The former Chief of the Special History Branch of the US Army Albert E. Cowdrey, claims the President believed this organization was supposed to combat polio in the military.<sup>256</sup> In reality, it was the Army Epidemiological Board that did most of the work researching polio in the military during World War II. Created in 1942, the board was “designed to predict and counter epidemic outbreaks among the people in uniform.”<sup>257</sup> However, due to the Army’s lack of concern over the threat that polio posed to American troops, the board initially did not take any steps to combat the disease.

---

94. <sup>255</sup> Resiter, 57, Table 42e, 786-7, Table 47e, 896-7, Table 52e, 1006-7; Paul, “Neurotropic Virus Diseases,”

<sup>256</sup> Cowdrey, 124.

<sup>257</sup> Cowdrey, 97.

It was not until the theater surgeon of the Africa and Middle East Theater requested assistance from the Army Surgeon General that the board made any attempts to study the disease. In April 1943, in response to the call for assistance, the board sent a three man virus commission to Cairo to review the problem. The members of the commission, including Paul, set up a virus laboratory at the 38<sup>th</sup> General Hospital in Cairo and spent ten months studying polio and other diseases of concern in the theater. Hoping for a significant breakthrough and in a rare moment of civilian assistance to the military, the National Foundation for Infantile Paralysis gave the commission a grant of \$10,000 to carry out its mission. In December, the virus commission shut down its laboratory “after making valuable contributions to the literature of the disease they studied.”<sup>258</sup>

One of the more notable achievements of the commission was to prove that, despite official protests by Egyptian authorities and the belief of several Allied medical authorities, poliomyelitis was indeed present in Egypt. Such a finding was vital in demonstrating the source of infection in the troops who contracted the disease. Initially, a number of medical officers had been reluctant to support the diagnosis of polio and found it hard to believe that the disease had been contracted locally, due to lack of infections among native Egyptians.<sup>259</sup> Instead, these individuals preferred to believe that the troops had brought the disease with them to the theater.

The commission’s work proved that these troops had indeed contracted polio and that they had done so in areas where the disease was believed not to exist at all. It also showed that the disease was certainly endemic in Egypt and was actually more of a year-round disease than it was in the United States and Britain. While the commission’s conclusions did not lead to any

---

<sup>258</sup> Charles M. Wiltse, *The Medical Department: Medical Service in the Mediterranean and Minor Theaters* (Washington, DC: Government Printing Office, 1965), 99; Paul, *A History of Poliomyelitis*, 349-50; Paul “Neurotropic Virus Diseases,” 94-5; Paul, Havens, and Van Rooyen, 843.

<sup>259</sup> Paul, *A History of Poliomyelitis*, 353-4.

theories on how the Army could combat the disease, its mere formation illustrated an evolution taking place in the military's view of polio as a military disease.<sup>260</sup>

Once polio cases in the military began to rise significantly, the Army realized it needed to set forth certain standards of treatment for the disease. In 1943, the Preventive Medicine Service in the Office of the Surgeon General requested the Division of Medical Sciences at the National Research Council to hold a meeting of polio authorities to make recommendations to control the disease's spread in the military. The findings were put into circular letter number 175 issued by the Surgeon General of the Army. This letter, dated 20 October 1943, recommended certain preventive measures to be taken by the military. Even more important, it set forth recommendations for the treatment of polio by the Army. The letter stated that polio patients were to be treated at the closest hospital during the acute stage of the disease and that Iron Lungs were to be transported where they were needed. Furthermore, the letter recognized no treatments, including convalescent serum, that were able to lessen the extent of paralysis.<sup>261</sup>

The aspect of circular letter number 175 that was most difficult to fulfill was the transportation of Iron Lungs to the patients that needed them. The Iron Lung was the main respirator used during World War II. Invented by Harvard scientists Phillip Drinker and Louis Shaw in 1928, the Iron Lung was an air-tight tank that had a vacuum pump which changed the pressure inside the tank in order to force air into and out of the body. These machines were large, expensive, and required electricity to operate. Because of this, these devices were seldom available in foreign theaters of the war. "As a result, poliomyelitis patients who developed severe respiratory paralysis promptly died."<sup>262</sup> In very rare cases, Iron Lungs were successfully

---

<sup>260</sup>Paul, *A History of Poliomyelitis*, 352; Paul, Havens, Van Rooyen, 841.

<sup>261</sup> Sabin, 371-2.

<sup>262</sup> Paul "Neurotropic Virus Diseases," 95.

transported to distant areas to help treat victims of bulbar polio; unfortunately these cases were the exception, not the rule.<sup>263</sup>

The next area in which polio proved to be a major concern for the US military was in the Mediterranean. The Sicilian campaign was a disaster from a medical standpoint. “The disease record of the Seventh Army on Sicily was one of the worst compiled by any American field army during World War II.” Much of this disease problem can be blamed on the primitive sanitation of the island.<sup>264</sup> As with all other theaters in which sanitation was poor, polio flourished.

In 1943, the Army in the Mediterranean Theater had forty-two cases of polio; thirteen of these occurred in July and August as Allied forces fought to secure Sicily. The Italian campaign was not any better; fifteen of these cases occurred in the months following the initial invasion of the Italian mainland. For the year, polio caused the death of ten American servicemen out of only 100 total disease related deaths in the theater that year. There is even some likelihood that polio might have been more frequent in the theater than these numbers illustrate. Cowdrey notes that the Sicilian campaign saw a lot of GIs diagnosed with “fever-of-unknown origin.” Given polio’s tendency to cause flu-like symptoms and the large percentage of infections that do not result in paralysis, there is a good possibility that these fevers were in fact caused by nonparalytic polio.<sup>265</sup>

As the Allies labored to expel the Germans from Italy in 1944, their medical departments continued to struggle with polio. The theater had sixty cases of the disease in 1944, twenty-five

---

<sup>263</sup> Paul “Neurotropic Virus Diseases,” 98; Oshinsky, 61; Timothy James Bazzett, *Love, War & Polio: the Life and Times of Young Bill Porteous* (Reed City, MI: Rathole Books, 2007), 107-8.

<sup>264</sup> Cowdrey, 132-3.

<sup>265</sup> Cowdrey, 133; Reister, Table 42d, 784-5, Table 52d, 1004-5.

alone in the month of July.<sup>266</sup> The following year was not much better. True, the months leading up to the Nazi surrender in 1945 did not yield any new cases of polio for the Army in Italy.

However, just because the German's surrendered did not mean the poliovirus was going to do the same. Forty-five more Americans contracted the disease in the six months following V-E Day. Polio was certainly a disease of concern in the Mediterranean Theater; in the end it killed more Army personnel than any other infectious or parasitic disease with the exception of tuberculosis.

Polio also appeared in significant numbers in the China-Burma-India (CBI) Theater. As with the Middle East and the Mediterranean, the CBI was a health officer's nightmare. "Civilian health services, clean water, and safe sewage disposal facilities were totally inadequate throughout the area."<sup>267</sup> Because of this, the annual death rate for fatalities caused by disease, including polio, was greater than one per 1,000 average troop strength.<sup>268</sup>

One of the more notable manifestations of the health issues in the CBI came in the form of the famous Merrill's Marauders. This group's mission was to move behind Japanese forces and ambush them at the same time that Chinese troops led by General Joseph Stilwell attacked from the front. Because of their detachment from the larger army, the Marauders were often far away from any medical help and susceptible to disease. These conditions ultimately led to disease decimating the Marauders' ranks, with the group suffering over 2,000 non-battle casualties.<sup>269</sup>

The example of Merrill's Marauders illustrates perfectly the problem that the American military had with disease in the CBI. It is no surprise then that the theater had the highest polio

---

<sup>266</sup> Reister, Table 43d, 806-7.

<sup>267</sup> Ebbe Curtis Hoff, *Civil Affairs/Military Government Public Health Activities*, volume 8 of *Preventive Medicine in World War II* (Washington, DC: Government Printing Office, 1976), 636.

<sup>268</sup> Reister, 31-2.

<sup>269</sup> George Korson, *At His Side: the Story of the American Red Cross Overseas in World War II*, 169; Cowdrey, 85-8.

incidence rate of all American theaters of war, .17 per 1,000 average troop strength. Another inherent issue with the CBI was the vast amount of territory that the theater covered and the relatively small number of medical facilities. Polio cases often appeared at outposts thousands of miles apart, and the terrain of the region made evacuation difficult. As a result, the military attempted to keep a number of respirators to respond to the appearance of bulbar cases. That these Iron Lungs were not always in the right spot at the right time was inevitable.<sup>270</sup>

The Army experienced its first reported case of polio in the CBI in August 1942. Only two other cases were diagnosed for the year, but due to the small number of American forces in the theater at the time, the admission rate for 1942 was .34 per 1,000 average troop strength. The number of polio cases rose each subsequent year, as more American troops were sent to the theater, topping out at a high of forty in 1945. However, because of the influx of troops, the admission rate actually continuously declined throughout the war. The cases in the theater also disproportionately ended in death, with eleven deaths out of twenty-five cases in 1944 and twenty-three deaths out of the forty cases in 1945. Throughout the entire war, only scrub typhus killed more Army GIs (sixty) in the CBI than polio.<sup>271</sup>

Elsewhere in the war against Japan, the American forces had not been significantly threatened by polio. Only six cases among Army personnel were diagnosed in the Pacific Ocean Areas, which included the Gilbert Islands, the Marshall Islands, the Marianas, Paula Islands, and the Solomon Islands. Douglas MacArthur's troops had also fared fairly well in the Southwest Pacific Theater, with no cases of polio having been reported in any action prior to the Philippines Campaign. Such luck was about to run out.<sup>272</sup>

---

<sup>270</sup> Hoff, *Communicable Diseases*, 39; Sabin, 397.

<sup>271</sup> Reister, Table 41f, 767-7, Table 31d, 582-3, Table 30d, 550-1, Table 50f, 964-5.

<sup>272</sup> Reister, 57, Table 30f, 558-9, Table 43g, 812-3.

The retaking of the Philippines began with the invasion by the Sixth Army of the island of Leyte on 20 October 1944. The invasion force included more than 200,000 troops and more than 700 ships, making it the largest amphibious operation in the war against Japan up to that point. From the very beginning of the Leyte operation, medical authorities worked hard to ensure that disease discipline was tight. This task proved more difficult than they had anticipated, especially where polio was concerned.<sup>273</sup>

Cases of polio began to occur slightly over two weeks after the invasion had begun, and the conditions on Leyte eventually caused a relatively high incidence rate of the disease. Sabin blames the high rate of “bacterial, protozoal, and viral infections,” on the island’s “lack of latrines, the heavy fly population, and the civilian habits of defecating on the ground.”<sup>274</sup> All told, the Sixth Army in the Philippines had the second worst disease record of the entire war, finishing just behind the Seventh Army in Sicily.<sup>275</sup>

The number of polio cases during the Leyte outbreak is disputed, but the number was probably around thirty-nine in the months of November and December.<sup>276</sup> The X Corps alone had thirty-three cases during these two months. Furthermore, the epidemic was also characterized by a high mortality rate. Twelve of the cases resulted in death, each from respiratory failure. More than likely these fatalities were brought about by the lack of available respirators. Only three Iron Lungs were transported to the Philippines, and these were in such constant use that they often had to be repaired or replaced. The fact that only three Iron Lungs

---

<sup>273</sup> Cowdrey, 294; Condon-Rall and Cowdrey, 319 & 322.

<sup>274</sup> Sabin, 396.

<sup>275</sup> Paul “Neurotropic Virus Diseases” 96; Paul *A History of Poliomyelitis*, 354; Cowdrey, 305.

<sup>276</sup> The number thirty-nine for the two months comes from Sabin, 391; Paul puts the number at forty-seven, thirty-seven of which were paralytic just in the month of November in *A History of Poliomyelitis*, 354; Meanwhile the number is placed at thirty-six in R. S. Anderson, E. C. Hoff, and P. M. Hoff eds. *Special Fields*, volume 9 in *Preventive Medicine in World War II* (Washington, DC: Government Printing Office, 1963), 520-1.

were available to treat at least twelve bulbar cases illustrates just how ill-prepared the Army was to face polio in the Philippines.<sup>277</sup>

Eventually, the Army sent the Nineteenth Medical Service Detachment to investigate the epidemic. Once on Leyte, the detachment performed autopsies on the servicemen who had died from polio and inoculated monkeys with material from the victims so that they could study the particular strain of poliovirus. Like many of their counterparts in Egypt, the Leyte investigators concluded that the troops had brought the virus with them to the Philippines. The fact that there had been absolutely no polio cases occurring in the attacking force prior to the invasion of Leyte makes such a theory highly improbable. As was the case in Egypt, the disease was endemic in the Philippines; therefore, while it was not evident among the population, the virus was certainly present in the country.<sup>278</sup>

Over the course of the next several months, the Americans made landings on the most important of the Philippine Islands and at each step the poliovirus was present. In Manila, the sanitation was so bad that Cowdrey refers to it as resembling “nothing so much as a huge dump,” covered in human feces and full of disease.<sup>279</sup> The Philippine campaign of 1945 resulted in 246 cases of polio, a number that Sabin reports was almost certainly too low, since many cases were misdiagnosed as either Gullain-barré syndrome, atypical dengue fever, or fever of unknown origin.<sup>280</sup> Furthermore, fifty-two of these cases resulted in the victim’s death. Such high numbers could have easily passed for an epidemic if they had occurred in an American city.<sup>281</sup>

The only major campaign that the Army waged to control the spread of polio was the

---

<sup>277</sup> Charles M. Wiltse ed., *Medical Supply in World War II* (Washington, DC: Government Printing Office, 1968), 490; Anderson, Hoff, and Hoff, 520-1.

<sup>278</sup> Anderson, Hoff, and Hoff, 521; Sabin, 394; Paul, “Neurotropic Virus Diseases,” 96.

<sup>279</sup> Cowdrey, 304-5.

<sup>280</sup> Sabin, 391-2; Paul puts the number of cases at 245 in “Neurotropic Virus Diseases,” 96.

<sup>281</sup> Sabin, 392.

Rockford, Illinois DDT trials. When it was first introduced, DDT was hailed as a miracle discovery. Medical historian Margaret Humphreys notes, “The American people wanted DDT. Rarely has a public health effort had such a strong public demand.”<sup>282</sup> Meanwhile, both the British and American militaries had used it with varying success in the fight against malaria and typhus, and since it was believed that polio was spread by flies, some medical authorities hoped the insecticide could also control its spread. Paul used the Rockford epidemic to test this theory. He used Army B-25s to spray the city from the air and Army trucks to spray from the ground. The miracle chemical did not have the effect that they had hoped; the disease continued to spread. Following this failure, the military did not undertake any other significant attempts at controlling the spread of polio.<sup>283</sup>

When a serviceman contracted a disease during World War II, the first job of the medical personnel was to diagnose him. In this regard, polio posed a tremendous problem. During the early 1940s, poliomyelitis was an extremely difficult disease to diagnose in adults because few doctors had any experience with it in the first place, and secondly there was a significant lack of adequate medical information about the disease’s effects in older patients. Furthermore, doctors were often reticent to diagnose a case of polio out of fear that it could in fact be another disease. Much of this can be blamed on the fact that polio exhibits no disease-specific symptoms, rendering an early diagnosis except in cases of paralysis nearly impossible. Even spinal taps did not always yield a precise diagnosis. Often the only way that medical personnel could be

---

<sup>282</sup> Margaret Humphreys, *Malaria: Poverty, Race, and Public Health in the United States* (Baltimore: Johns Hopkins University Press, 2001), 147.

<sup>283</sup> Mark Harrison, “Medicine and the Culture of Command: the Case of Malaria Control in the British Army During the Two World Wars,” *Medical History* 40 (1996): 449-50; “Bomber Sprays Rockford with DDT in polio war,” *Chicago Daily Tribune*, August 20, 1945; “Army Plane Battles Polio with DDT Spray,” *Atlanta Constitution*, August 20, 1945.

completely sure that a victim was suffering from polio was to inject fecal material into a laboratory monkey and wait for the primate to develop symptoms of the disease.<sup>284</sup>

Such difficulties in diagnosis make it likely that the number of cases of polio during World War II has been underrepresented. As Sabin argued about the Philippines epidemic, cases of nonparalytic polio were easy to misdiagnose as another disease, and there is no reason to believe that this did not happen throughout all theaters during World War II. Military medical personnel, especially during combat conditions, did not always have the luxury to take their time on diagnoses, especially one as difficult as polio.<sup>285</sup> Furthermore, the resources were just not available to perform the tests needed to confirm that a case was indeed poliomyelitis. Therefore, many cases were likely listed as fever-of-unknown origin or as any other number of diseases.

Following a positive diagnosis of polio, the next step was to evacuate the victim from the battlefield and take them to a theater hospital. In some campaigns, like Sicily, the sick and wounded were taken straight to hospital ships and then transported to land-based hospitals located elsewhere. However, in more remote areas, the only way to evacuate critical cases was through aeromedical evacuation.<sup>286</sup>

The use of airplanes in the evacuation of the sick and wounded was a recent development. One major advantage to this type of transportation was the speed with which a soldier could be transported to a medical facility. In many cases throughout the war, this speed saved the lives of servicemen who might have otherwise perished. The most common aircraft used for this purpose was the C-47, like the one Bryant was transported in on his trip from Paris

---

<sup>284</sup> Paul, "Neurotropic Virus Diseases," 94 & 97-8; Daniel J. Wilson "A Crippling Fear: Experiencing Polio in the Era of FDR," *Bulletin of the History of Medicine* 72 (1998): 472, Project Muse; Goldstein, Hammon, and Viets, 369.

<sup>285</sup> Wiltse, *Medical Service in the Mediterranean*, 173.

<sup>286</sup> Pyle, 53; James Nanney, *Army Air Forces Medical Services in World War II* (Honolulu: University Press of the Pacific, 1998), 10.

to Great Britain. These flights were usually accompanied by medical technicians and flight nurses who made sure the passengers were comfortable and performed necessary procedures in-flight.<sup>287</sup>

Once patients had passed through the acute stage of the disease at a theater hospital, the next step was usually to evacuate them back to the Zone of the Interior. Patients suffering from polio were nearly always transported back to the States.<sup>288</sup> However, because of the relatively short range of most aircraft, aeromedical evacuation was only used in very rare casualty cases. For most soldiers, polio patients included, the only way to get back to America was on board a hospital ship. World War II era hospital ships were neutral vessels and sailed under the protection of the Geneva Conventions. To keep from being targets for attack, these ships were painted white with large red crosses and sailed fully alight at night.<sup>289</sup> Polio patients were given a berth on such ships and had to endure the long journey back to the United States.

Once a vessel carrying wounded and ill soldiers docked in one of America's port cities, the casualties were unloaded and sent to a receiving hospital. Throughout the journey, victims were made to wear tags that informed the reader of the patient's diagnosis. For polio patients, these tags were often attached to their toe so that the medical personnel at the receiving hospital could read their diagnosis while they were still being carried on their litter.<sup>290</sup> It was at these hospitals that the military made the decision as to what general hospital a patient should be sent for treatment.

After an average of three days spent at a receiving hospital, the patient was shipped to one of the many general hospitals located in the Zone of the Interior. At the beginning of the war,

---

<sup>287</sup> Cowdrey, 79-80; Nanney, 10-11.

<sup>288</sup> Wilson, "A Crippling Fear," 481; Paul "Neurotropic Virus Diseases," 98.

<sup>289</sup> Cowdrey, 51-2.

<sup>290</sup> Cowdrey, 318.

the standard procedure was to send individuals to the hospital closest to their hometown. As the war progressed and medical specialists became in short supply, the Army changed course. General hospitals were designated as specialty centers with all available specialists assigned to them and patients were sent to the hospital that best suited their needs.<sup>291</sup>

Often, patients were shipped to these general hospitals via a hospital train. These trains had fifteen to twenty cars with thirty-eight berths per car. Most trains had a complement of fifty to seventy-five enlisted-men, four or five medical officers, and eight to ten nurses.<sup>292</sup> For Army polio patients on these trains, the end of the line was a little town in Arkansas named Hot Springs.

The Army and Navy General Hospital (ANGH) in Hot Springs, Arkansas was the only center for the treatment of Army GIs with polio. The hospital was located on twenty-five acres of land, 680 feet above sea level and on the southwest slope of Hot Springs Mountain, just southwest of Little Rock. ANGH had been in service since 1887 and had primarily been used for the treatment of arthritis both in GIs and veterans.<sup>293</sup>

The most important aspect of the hospital was its use of the naturally occurring geothermal water of the area, which was sterile and often reached 140 degrees Fahrenheit. Prior to the hospital's construction, the city of Hot Springs had become famous for the reported healing powers of its heated mineral water. In a travel book published in 1882, Charles Cutter said of Hot Springs that it "stand[s] without a rival. At no place in the known world can so many

---

<sup>291</sup> Cowdrey, 319; Bazzett, 125-6; Emma E. Vogel, Mary S. Lawrence, and Phyllis R. Strobel in Harriet S. Lee and Myra L. McDaniel eds., *Army Medical Specialist Corps* (Washington, DC: Government Printing Office, 1968), 238 ; Clarence McKittrick Smith, *The Medical Department: Hospitalization and Evacuation, Zone of the Interior* (Washington, DC: Government Printing Office, 1956), 194-5.

<sup>292</sup> Bazzett, 127-8.

<sup>293</sup> Vogel in Lee, McDaniel, 254; Annual Reports, 1930-1939, Record Group 112, Southwest Regional Archives, National Archives and Records Administration, Fort Worth, Texas.

diseases be effectually cured or greatly benefited.”<sup>294</sup> ANGH was constructed to take advantage of these waters; to “specialize in the treatment of those diseases for which the thermal waters of this area are reported to be beneficial.”<sup>295</sup>

By 1930, the old hospital building had become too small to fit the growing needs of the facility. With this in mind, the Veterans Bureau designated \$1,050,000 and the War Department allocated \$450,000 for the razing and rebuilding of ANGH. The demolition of the old building began on 20 August 1931, and the new building was occupied on 17 October 1933. ANGH’s new hospital building was hailed by its commanding officers as “the last word in construction” and “one of the scientifically complete service structures of its kind.” The new building had 412 beds, and a brand new therapeutic pool that had been patterned on the one at Warm Springs. ANGH was now ready for the influx of patients that were destined to come during the next decade.<sup>296</sup>

Despite the growing number of polio cases during the 1930s, the hospital at ANGH treated relatively few cases of the disease. One polio patient was treated in 1932, two more in 1933, and five in 1934.<sup>297</sup> These numbers pale in comparison to the workload that the hospital had during World War II. During the war years, ANGH averaged eighty polio patients at any one time.<sup>298</sup> While this number may not seem very impressive at face-value, when one considers the basic human needs of eighty paralyzed men, some of whom were still in Iron Lungs, that the

---

<sup>294</sup> Charles Cutter, *Cutter’s Guide to the Hot Springs of Arkansas* (St. Louis: Slawson & Company, 1882), 26.

<sup>295</sup> Annual Report of the Army and Navy General Hospital at Hot Springs, Arkansas, 1932, Annual Reports, NARA Southwest.

<sup>296</sup> Annual Report of the Army and Navy General Hospital at Hot Springs, Arkansas, 1930, Annual Report of the Army and Navy General Hospital at Hot Springs, Arkansas, 1932, Annual Report of the Army and Navy General Hospital at Hot Springs, Arkansas, 1933, J. R. Shcok in Annual Report of the Army and Navy General Hospital at Hot Springs, Arkansas, 1934, Wm. H. Moncrief in Annual Report of the Army and Navy General Hospital at Hot Springs, Arkansas, 1938, Annual Reports, NARA Southwest.

<sup>297</sup> Annual Report 1932, Annual Report 1933, Annual Report 1934, Annual Reports, NARA Southwest.

<sup>298</sup> Wilma L. West in Lee & McDaniel, 318.

medical staff at ANGH had to meet on a daily basis, not to mention the intensive physical therapy that accompanied the disease, the sheer amount of work that went into running this hospital becomes evident.

The other major center for servicemen that had contracted polio during World War II was located at Warm Springs. Most of these GIs were from the Navy and the Marine Corps. The polio victim and Navy Pharmacist Mate, Bentz Plagemann remarked that out of the nearly 100 patients at Warm Springs when he arrived, approximately twenty of these were Navy and Marine Corps men.<sup>299</sup> Eventually, the Navy formally negotiated a deal with FDR to make Warm Springs an official Navy polio center, and it built the east wing of the foundation for this purpose.<sup>300</sup>

After the construction was completed, the Navy officially established its polio unit on 1 April 1945. The Warm Springs unit was the only one in the military that worked with civilian authorities. By July, Warm Springs was treating forty sailors and marines who had contracted the disease; one of them, Pfc. Hurd Hill was an African-American marine who had contracted the disease on Guam.<sup>301</sup>

That Hill was able to get treatment at the famous Warm Springs Foundation illustrates a key difference between the experiences of civilian polio victims and their counterparts in the military. Prior to the Navy's creation of its polio unit at Warm Springs, blacks had not been admitted for treatment at the foundation. Late in the 1930s, this started to become a political issue for FDR, but he was not willing to intercede because of the facility's location in the south. It was because of this that the NFIP awarded a grant to the Tuskegee Institute in Alabama in order for it to set up its own polio center for African-Americans. Meanwhile, in the military

---

<sup>299</sup> Bentz Plagemann, *My Place to Stand* (New York: Farrar, Straus, & Company, 1949), 169.

<sup>300</sup> Hugh Gregory Gallagher, *FDR's Splendid Deception* (New York: Dodd, Mead & Company, 1985), 155; "Hospital Addition," *Atlanta Constitution*, February 9, 1945.

<sup>301</sup> "Navy Mends Men at Warm Springs," *The New York Times*, July 8, 1945.

black soldiers were often sent to hospitals based on “their diagnosis and medical needs,” not their skin color.<sup>302</sup> The fact that blacks were now being treated at Warm Springs was touted as a victory for the NFIP, but in reality it was the military that made it happen.<sup>303</sup> There does not seem to have been much public outrage over these developments as the story was not even carried in the *Atlanta Constitution*.

During World War II, both ANGH and Warm Springs instituted a mix of the Kenny Method and hydrotherapy to treat their polio patients. Army and Navy doctors began being trained in Sister Kenny’s method as early as 1942. Because of this training, most polio patients during World War II had to undergo intense physiotherapy designed to reestablish movement in paralyzed muscles. Physical therapists became so important in the treatment of polio and other wounded soldiers that they were awarded relative rank in 1943.<sup>304</sup>

Hydrotherapy also proved to be very beneficial to these victims. The natural buoyancy of the thermal waters allowed patients who were otherwise unable to move their limbs to perform some exercises. A device called the “Roosevelt Chair” lowered patients into the water where a physical therapist was waiting to help the patient through his regimen.<sup>305</sup> Such a mixture of hydrotherapy and the Kenny Method seems to have been the most effective treatment of polio that the Army was able to give its servicemen.

The military also believed in the use of occupational therapy. Occupational therapy was a program that allowed wounded and paralyzed soldiers to perform tasks in order to occupy their

---

<sup>302</sup> Cowdrey, 11.

<sup>303</sup> Oshinsky, 65-6; Naomi Rogers “Race and the Politics of Polio: Warm Springs, Tuskegee, and the March of Dimes,” *American Journal of Public Health* 97, no. 5 (May 2007): 791.

<sup>304</sup> Victor Cohn, *Sister Kenny: the Woman Who Challenged the Doctors* (Minneapolis: University of Minnesota Press, 1975), 151; Lyman L Bryan, “A Polio Victim Tells His Own Story- From the First Symptoms to the Present,” *Arkansas Democrat Magazine*, June 24, 1945, 4; Cowdrey, 107; for a discussion on the role that polio played in the development of the field of physical therapy see Donald Neumann “Polio: its Impact on the People of the United States and the Emerging Profession of Physical Therapy,” *Journal of Orthopedic and Sports Physical Therapy* 34, no. 8 (2004): 479.

<sup>305</sup> Annual Report 1938, Annual Reports, NARA Southwest.

minds. “The army discovered early in the war that wounded soldiers responded better to all their treatments, physical as well as psychological, if they felt that they were accomplishing something, rather than simply lying in bed biding their time.”<sup>306</sup> These tasks often included crafts or projects such as building models. The major objectives of occupational therapy were to bring about the victim’s maximum recovery, to keep the patient from experiencing hospital fatigue, to foster a sense of initiative, to bolster the patient’s confidence, and to offer another form of exercise.<sup>307</sup> Occupational therapy was used extensively at ANGH.

One factor that distinguished the rehabilitation of polio patients from the rehabilitation of other servicemen was the length of time that the former lasted. Two of ANGH’s medical officers, George T. Wallace and William J. West, claim that the hospital was under strict orders from the Surgeon General to ensure that its patients reached the “maximum hospital benefit before being discharged.” In order to fulfill this directive, the hospital tried to make its patients “as self-dependent as possible.”<sup>308</sup>

That this was such a difficult task is evident in polio’s average duration of hospitalization, which was the longest of 140 diseases listed in Table 36c of Frank A. Reister’s *Medical Statistics of World War II*.<sup>309</sup> In a study done by physical therapist M. J. Torp on fifty former ANGH patients, the average length of treatment was nearly nineteen months, with the longest being thirty-six months.<sup>310</sup> Such long rehabilitation led to polio being a very expensive disease for the military to treat.

---

<sup>306</sup> Bob Dole, *One Soldier’s Story: a Memoir* (New York: Harper, 2005), 247.

<sup>307</sup> West in Lee and McDaniel, 318.

<sup>308</sup> George T. Wallace and William J. West, “Fascial Repair for Poliomyelitic Paralysis of the Abdominal Wall in Adults,” *Journal of Bone and Joint Surgery* 29, no. 4 (October 1, 1947): 1031-2.

<sup>309</sup> Reister, Table 36c, 698-9.

<sup>310</sup> M. J. Torp, “Poliomyelitis: Functional Progress Report of Fifty Cases Approximately Five Years Post-Onset,” *Physical Therapy Review* 33, no. 7 (July 1953): 353.

Eventually, after a patient's rehabilitation had achieved all of the gains it was going to, the staff at these polio centers made the decision to either return the soldier to duty or to discharge him to disability. The vast majority of these individuals were discharged to disability. So after the military paid for the long and expensive treatment, it usually ended up losing the soldier anyway. Such circumstances had to be a hard pill for medical officials to swallow.

The American military's experience with polio during World War II certainly proved beneficial in the postwar years. Not only was the military able to help fight domestic epidemics following the war, but it was better prepared to deal with outbreaks among citizens and its troops in the American zone of occupation in Germany. The late 1940s and early 1950s witnessed the rate of polio rising to never-before-seen levels in both the United States and Western Europe. In 1947, a polio epidemic erupted in Berlin with as many as 125 new cases among Germans per week. The following year, a major outbreak occurred in Bavaria, resulting in at least fourteen cases among American personnel and approximately 1,190 total cases. The next three years, 1949, 1950, and 1951 each resulted in more cases of polio being reported among the American occupation force.<sup>311</sup> While it could not prevent the disease, it is easy to assume that the American military, due to its experiences during World War II, was able to give these victims the best available treatment.

The scientific legacy of the military's experience with polio in World War II is perhaps even more important. Researchers began to grow curious about why American troops seemed to be susceptible to the disease while populations from other countries did not. It was this curiosity that sparked postwar serological studies which illustrated the theory that polio had shifted from

---

<sup>311</sup> Annual Report on Activities of the Preventive Medicine Branch for the year 1948 (covering 1947), Box 122, Medical History Files, 1943-1958, ARC ID 581232, National Archives II, National Archives and Records Administration, College Park, Maryland; Quarterly Report on Activities Preventive Medicine Division April 1- June 30 1948, Box 122, Medical History Files; Quarterly Report on Activities Preventive Medicine Division 1 July- 30 Sept 1948, Box 122, Medical History Files; Reports for 1949, 1950, and 1951, Box 115, Medical History Files.

endemic to epidemic as sanitation improved and individuals became less likely to encounter the disease in infancy. This theory is one of the most profound discoveries about poliomyelitis that was ever made, and it shapes our current understanding of the disease.<sup>312</sup>

Polio certainly became a disease of some importance among military medical officials during World War II. Leading up to the war, military authorities did not believe that the disease was one that could cause much harm to its servicemen. In reality, the disease affected American troops both at home and abroad. Polio also proved deadly and expensive, both in terms of manpower and money, to the military. By the end of the war, the Army and Navy's medical departments had come to view polio as very serious issue.

---

<sup>312</sup> Paul, *A History of Poliomyelitis*, 356 & 364-5.

## CHAPTER 4

### THE MEN

On 7 November 1944, Corporal William Bryant was loaded onto a C-47 and flown to the 192<sup>nd</sup> General Hospital in Great Britain where he spent the better part of a month. Then on 1 December, Bryant was loaded onto the *Queen Elizabeth* for a seven-day voyage back to the United States. After spending the obligatory number of days at a receiving hospital in New York City, he was sent via train to the final stop on his journey; Army and Navy General Hospital (ANGH) in Hot Springs, Arkansas.<sup>313</sup>

The story of polio during World War II would not be complete without a discussion of its victims and the effect that it had on their lives. From the moment that these individuals contracted the disease, polio became the most important influence on their futures. These soldiers had to endure a long and painful evacuation from the battlefields and theaters to the United States only to be shipped off to a rehabilitation center somewhere in the interior of the country. These men were destined to call the hospitals home for a length of time that stretched anywhere from eight months to two years. Finally, these GIs were discharged from the Army, given a pension that in many cases was insufficient, and forced to try to make their way in a world littered with obstacles for anyone who was unlucky enough to have a physical disability. While polio certainly shaped the way combat was carried out in select theaters of war, this paled in comparison to the effect that the disease had on the lives of the servicemen who contracted it during World War II.

---

<sup>313</sup> Scrapbook of William Allen Bryant, Jr., original in possession of the author; Service Record of William Allen Bryant, Jr., Original in possession of author; Litter Tag: "Litter Case, Diagnosis: Poliomyelitis Anterior, Cabin No. p-5-6," Scrapbook.

There was no type of GI that was more susceptible to developing paralytic polio during World War II. At the time, the disease was viewed as unpredictable because of its ability to infect only one person, even in areas that polio was thought to be rare. Now we know that in fact the disease itself was not random, but that its paralytic form was. Because of this, many patients who developed paralysis did so in varying circumstances.

As we have seen in the previous chapter, servicemen who contracted polio during World War II did so in a number of different settings. Some caught the virus in the United States, like Walt Ballard who first experienced symptoms in Mission, Texas while in the midst of a pilot training program. Others contracted it in North Africa or other parts of the Mediterranean. Navy personnel sometimes caught the disease while at naval bases in the Atlantic, such as Adrian C. Rosha, Jr. who contracted polio when he was sent to the Azores. Finally, a large portion of the victims encountered the virus somewhere in Asia, especially in the Philippines.<sup>314</sup>

The circumstances in which these infections occurred also differed dramatically. “Some were stricken on the battlefield, others far from the fighting front.” Some GIs became infected after having served for a significant portion of the war, while at least one polio victim contracted the disease the day after he was sworn in.<sup>315</sup> One soldier, Larry Carmel, even caught polio while he was recovering from being hit by shrapnel on the French-German border.<sup>316</sup>

Some of its victims were stricken with the disease during an outbreak, giving them knowledge of several other polio patients. John Macioce, known as “Mace” to his friends, contracted polio during the outbreak at Fort Bragg. In his case, he was able to compare his illness

---

<sup>314</sup> Timothy James Bazzett, *Love, War & Polio: the Life and Times of Young Bill Porteous* (Reed City, MI: Rathole Books, 2007), 349 & 387; Kathryn Black, *In the Shadow of Polio: a Personal and Social History* (Reading, MA: Addison-Wesley, 1996), 92; Morris W. Gooch contracted it in Casablanca, “Navy Mends men at Warm Springs,” *New York Times*, July 8, 1945.

<sup>315</sup> C. C. Allard, “Wounded and Ill Vets Find Haven at Spa,” *Arkansas Democrat Magazine* (June 17, 1945): 4.

<sup>316</sup> Gary Libman, “Churches and Synagogues Offer a Sign for the Disabled,” *The Los Angeles Times*, July 26, 1985, [http://articles.latimes.com/1985-07-26/news/vw-5210\\_1\\_deaf-church](http://articles.latimes.com/1985-07-26/news/vw-5210_1_deaf-church) (Accessed 12 July 2011).

with others, even those who were worse off like those who developed bulbar polio and had to be placed in Iron Lungs.<sup>317</sup> Others seemingly caught the disease at random and were the only individual they knew who had contracted polio. Such cases undoubtedly led these individuals to adopt the refrain so common to polio survivors; “I was the only one who got it.”<sup>318</sup>

Poliovirus did not discriminate; it attacked men from all backgrounds. At Hot Springs, the Army treated polio victims who were Catholic, Protestant, and Jewish. During the war, “a Mormon priest, a Rabbi, a [former] Harvard professor, and a [former] Notre Dame football star,” all called the polio ward at ANGH home.<sup>319</sup>

During World War II, individuals of all ages were susceptible to polio. When, in the early 1950s, physical therapist M. J. Torp sent questionnaires to patients who had been treated at ANGH during the war, she found that two of these patients had contracted the disease when they were only seventeen years old; one victim had been thirty-five when the infection began; and the average age at the onset of illness for the respondents was 23.5.<sup>320</sup>

A polio victim could come from any branch of the American Armed Forces. Working in harsh conditions of the battlefield put ground forces at risk. One polio patient who was treated at ANGH had served as a German language interpreter with the 66<sup>th</sup> Division in Europe. Navy personnel were also susceptible to the disease. Perhaps one of the best known examples of a Navy serviceman who contracted polio is Bentz Plagemann. Plagemann was serving as a Pharmacist’s Mate when he contracted the disease in Naples in 1944. He was eventually shipped back to the United States, sent to Warm Springs, and authored the only memoir of a polio

---

<sup>317</sup> Bazzett, 367.

<sup>318</sup> Edmund J. Sass, George Gottfriend, and Anthony Sorem, eds, *Polio’s Legacy: an Oral History* (Lanham: University Press of America, 1996), 23.

<sup>319</sup> Lyman L. Bryan “A Polio Victim Tells His Own Story— From the First Symptoms to the Present,” *Arkansas Democrat Magazine* (June 24, 1945): 4; Allard, 5.

<sup>320</sup> Torp contacted 135 patients and received 50 responses, M. J. Torp, “Poliomyelitis: Functional Progress Report of Fifty Cases Approximately Five Years Post-Onset,” *Physical Therapy Review* 33, no. 7 (July 1953): 352; “Soldier, 17, has Paralysis,” *New York Times*, August 11, 1944.

veteran to have ever been published. Even airmen could catch the disease. William Richardson Timmons contracted polio when he was sent to the Pacific to pilot a B-29 Superfortress.<sup>321</sup>

The first sign of a polio infection was the development of symptoms, often mild and flu-like. Fred Davis, a sociologist who studied the experiences of polio victims in the 1950s, termed this first stage “the prelude stage.” The prelude stage begins at the first sign of symptoms and ends once it is realized that the disease is not an ordinary one.<sup>322</sup> In Plagemann’s case, the seaman first began to run a fever of 102 degrees Fahrenheit and then started to experience pain in his back, legs, and eventually his neck.<sup>323</sup>

After a short period, these symptoms began to grow more serious, often resulting in varying degrees of paralysis. It was upon this development that most victims began to realize that they were in fact sicker than they had led themselves to believe. Davis calls this period “the warning stage.”<sup>324</sup> Some, like William Bryant, lost the ability to move their legs, while others experienced paralysis in other limbs. One polio victim, a gunner in a bomber crew, had first noticed that his arm was paralyzed when he was in the middle of a raid. Another GI suffered a similar fate when his arm went numb while he was serving on the front-line of the Allied advance in Normandy in 1944.<sup>325</sup>

Once the soldier realized that these symptoms were more severe than he had imagined, he often reported to sick call. Lyman L. Bryan, a member of the US Army, after experiencing a severe fever reported to sick call at his station hospital in Massachusetts. After medical personnel

---

<sup>321</sup> Allard, 4; Bentz Plagemann, *My Place to Stand* (New York: Farrar, Straus, & Company, 1949), 7 & 76; Tony Gould, *A Summer Plague: Polio and its Survivors* (New Haven: Yale University Press, 1995), 113; “Obituary: Ronald W. Timmons, *Deseret News* March 13, 2005, <http://www.deseretnews.com/article/1317524/Obituary-Ronald-W-Timmons.html> (Accessed July 14, 2011).

<sup>322</sup> Fred Davis, *Passage Through Crisis: Polio Victims and their Families* (Indianapolis: Bobbs-Merrill, 1963), 20.

<sup>323</sup> Plagemann, 77-8.

<sup>324</sup> Davis, 23.

<sup>325</sup> Allard, 4.

ran a battery of tests, they reported to Bryan their diagnosis; he had contracted polio. Plagemann, on the other hand, diagnosed himself after studying a book of illnesses that the Navy had placed aboard his ship. After he was transferred to an Army Hospital in Naples, the doctors confirmed his self-diagnosis through the use of a spinal tap.<sup>326</sup> For Davis's study, the stage where the patient receives a positive diagnosis is referred to as "the impact stage."<sup>327</sup>

Receiving a positive diagnosis was not easy for a serviceman to accept. At the time, polio was still viewed as primarily a children's disease. It also "called up images of life as a useless cripple," at a time when the handicapped were looked on with disdain by the average able-bodied person.<sup>328</sup> GIs who contracted polio were a unique group, not only did they share the experiences of fellow polio victims but they also shared the experiences of wounded soldiers. For many of them, leaving their stations because of polio led them to feel that they had in some-way failed their comrades. Finally, many were unable to come to grips with the fact that their lives had been irreparably altered. Bob Dole, who suffered a paralyzing wound while serving in Italy wrote in his memoirs, "As is often the case with any traumatic blow to a person's physical or emotional well-being, I didn't totally understand the seriousness of my injuries, and I was not ready to accept the fact that my life would be changed forever."<sup>329</sup>

Some victims of polio were never officially diagnosed. Paul Appleby was a flight trainer in the Army Air Corps who was stationed in Pampa, Texas. Just before he was supposed to be shipped out for overseas duty, he suffered paralysis, which quickly became serious and resembled a case of bulbar polio. Because of the severity of his paralysis, Appleby was flown via

---

<sup>326</sup> Plagemann, 80-1 & 89.

<sup>327</sup> Davis, 29.

<sup>328</sup> Daniel J. Wilson, "A Crippling Fear: Experiencing Polio in the Era of FDR," *Bulletin of the History of Medicine* 72 (1998): 490, Project Muse.

<sup>329</sup> Bob Dole, *One Soldier's Story: a Memoir* (New York: Harper, 2005), 160-1; Bazzett, 105; Plagemann reports feeling this way, 96.

a B-25 to Temple, Texas, the location of the nearest Iron Lung. Eventually, after he recovered enough to be moved, he was sent to the polio ward at ANGH. Despite exhibiting the classic symptoms of a case of polio, Appleby was never officially diagnosed with the disease. Instead, his paralysis was blamed on an allergic reaction to his required immunizations, and he lived the rest of his life denying that he ever contracted polio.<sup>330</sup>

Following a positive diagnosis, a soldier was generally sent into isolation. It was standard procedure at the time to enforce a two- to three-week period of isolation for all polio victims and the military was no exception.<sup>331</sup> The medical community still believed that the disease was extremely contagious during the acute stage and that such isolation might reduce its spread. During isolation, polio victims were housed in a room either by themselves or with other victims, and they were not allowed any outside visitors.

The next step for the military was to notify the next of kin that the GI had contracted polio, much like they did for any other serious casualty. In the case of Bill Porteous, an Army Captain who contracted polio shortly after the war had ended, the role of notifying his wife fell to the Navy which was currently responsible for his medical care.<sup>332</sup> For the families of servicemen who contracted the disease overseas, the notification process was certainly more difficult.

In rare cases, an alert physician might begin treatments based on Sister Kenny's method while the serviceman was still in the acute stage. This was the case for Plagemann, who was started on Kenny treatments at the hospital in Naples.<sup>333</sup> While these treatments were probably

---

<sup>330</sup> Paul Appleby, "Paul Appleby" Green Acres Baptist Church Veterans Memorial Project, <http://www.gabc.org/assets/1485/applebypaul.pdf> (Accessed July 17, 2011); Bill Porteous, who contracted polio in late 1945, also began to exhibit symptoms of the disease shortly after receiving his overseas inoculations, but Porteous was eventually diagnosed with the polio, Bazzett, 93.

<sup>331</sup> Bazzett, 113.

<sup>332</sup> Bazzett, 104.

<sup>333</sup> Plagemann, 97-8.

ineffective at lessening the extent of paralysis that these victims were destined to live with, they certainly must have eased much of the pain associated with the acute stage of the disease, making life a little less uncomfortable for the patients.

Some unlucky victims developed the bulbar form of the disease and had to be placed in Iron Lungs. Karl von Hacht, Jr., an army clerk serving in the Philippines during the polio epidemic of late 1944 and early 1945, contracted the disease, developed bulbar symptoms, and spent the next year of his life dependent on an Iron Lung to breathe.<sup>334</sup> A similar incident was experienced by Harold C. Reynolds, a Seaman Second Class, who contracted the disease in August of 1944 at Portsmouth, Virginia. After developing bulbar symptoms, Reynolds was placed in an Iron Lung, where he stayed for eight months.<sup>335</sup>

Other bulbar patients were not as lucky as Hacht and Reynolds. During the polio years, it is estimated that nearly six out of every ten bulbar patients died, in a land where Iron Lungs were often readily available.<sup>336</sup> With the small number of Iron Lungs available to the military, especially overseas, it is not hard to believe that this number was exceeded in the Armed Forces during World War II. In Naples alone, Dr. Pocotte, the physician who treated Bentz Plagemann, lost six of the ten polio patients that he treated in the summer of 1944.<sup>337</sup> The death rate for bulbar cases in other less developed theaters of war was probably much higher.

Even soldiers who were fortunate enough to have access to an Iron Lung were not always assured of their survival. It was common for respiratory victims to lose a significant amount of weight, often wasting “away to skin-covered bones.” One Iron Lung patient at ANGH weighed

---

<sup>334</sup> Noor Al-Sammarrai, “Construction of Controversial House with Garden Roof Will Start this Spring,” *The Daily Californian*, November 22, 2010, [http://archive.dailycal.org/article/111291/construction\\_of\\_controversial\\_house\\_with\\_garden\\_ro](http://archive.dailycal.org/article/111291/construction_of_controversial_house_with_garden_ro) (Accessed 13 July 2011).

<sup>335</sup> “Navy Mends Men at Warm Springs,” *New York Times*, July 8, 1945.

<sup>336</sup> Black, 18.

<sup>337</sup> Plagemann, 97.

as little as sixty-nine pounds. Sometimes a patient's body was simply unable to adapt to life in a respirator. Iron Lung occupants sometimes died because of complications arising from being forced to lie flat on one's back or from the body's inability to synchronize its breathing rhythm with the one being forced on it by the machine.<sup>338</sup>

The effectiveness of Iron Lungs, being reliant on electricity to operate, was also subject to the availability of their power source. In cases of power outages, the life of the patient was put in danger. Plagemann reported that during his stay in Naples, another polio patient was confined to an Iron Lung. When the power went out and the man's respirator stopped working, a hospital nurse had to perform manual respirations to keep the soldier alive.<sup>339</sup>

In cases of polio, the first three weeks of the acute stage were the most crucial. Author Katheryn Black, whose mother died from complications of bulbar polio, reports that eighty-five percent of all polio deaths came in the first twenty days of hospitalization. Like infection, death from polio could strike anybody regardless of age, rank, and location. Colonel Henry Cumming Jr., serving in the G-2 section of the US Army in Italy, contracted polio in July 1945, a few months after hostilities had ended, and died. The year before, a twenty-four year old Lieutenant in the Coast Guard contracted polio in Chicago and died quickly. Some deaths came too fast for medical authorities to have any chance to save the patient. The last month of the war, August 1945, saw the death of Sergeant Warren H. Schroeder from polio. The *Washington Post* reported that Schroeder died within five minutes of being admitted to Walter Reed Hospital.<sup>340</sup>

For those who survived though, the journey had just begun. For the ones who contracted the disease near the front, the first step of the long and arduous road to rehabilitation came when

---

<sup>338</sup> Black, 17 & 55; Bryan, 5.

<sup>339</sup> Plagemann, 96-7.

<sup>340</sup> Black, 18; "Col. Cumming Dead of Polio, Va. Professor," *Washington Post*, July 20, 1945.; "Officers Death Puts Polio Toll in City at Three," *Chicago Daily Tribune*, September 9, 1944; "Hospitals Face Acute Shortage of Iron Lungs." *Washington Post*, August 22, 1945.

they were evacuated to hospitals farther in the rear. Such a journey was certainly unbearable for many of these servicemen. The acute stage of polio is notoriously painful; the victim's suffering intensified by any movement of his body. Evacuation of these individuals, whether by litter, jeep, or ambulance, especially over rough terrain, must have been excruciating.<sup>341</sup>

For the GIs who contracted the disease in the Pacific, evacuation sometimes came aboard one of the American Hospital ships. One such ship, the *USS Solace*, "the heroine of Pearl Harbor" as she was known, evacuated one polio victim from Okinawa in late June 1945. The *Solace's* sister-ship, the *USS Bountiful* also played a role in evacuating polio patients. One such patient, Frederick Wallace Darling, a private in the US Army was evacuated from Leyte during the height of the island's major polio epidemic of November 1944. Private Darling, listed in serious condition, was then transferred to the US Army's 51<sup>st</sup> General Hospital in New Guinea. For both of these patients, the hospital ships were certainly a god-send, especially for the patient aboard the *Solace*, which at the time, was the most accomplished "modern hospital vessel anywhere afloat."<sup>342</sup>

Many other polio patients, in all theaters of the war, had to be evacuated by airplane. This was primarily because of the growing trend in the American military to rely on C-47s and aeromedical evacuation. However, the serious condition of most polio cases also prompted such decisions. Bulbar cases were the most likely to experience the speedier style of evacuation because of the need to transport them to the nearest Iron Lung as quickly as possible.

---

<sup>341</sup> Wilson, "A Crippling Fear," 481.

<sup>342</sup> Albert Q. Maisel, *The Wounded Get Back* (New York: Harcourt, Brace and Company, 1943), 16 & 20-1; Casualty Records for the *USS Solace* 23 June 1945-1 July 1945, Records of the Bureau of Naval Personnel, Record Group 24, National Archives II, National Archives and Records Administration, College Park: Maryland; War Diaries of the *USS Solace*; Naval Casualties Records for the *USS Bountiful*, Naval Shore Installations: 8<sup>th</sup> Naval District, Records of the Commandant, Record Group 181, Southwest Regional Archive, National Archives and Records Administration, Fort Worth, Texas.

The second stage of a polio victim's journey came when the military decided to evacuate him to the Zone of the Interior. Most polio patients, like William Bryant, were shipped back to the United States on troop carriers with numerous other wounded soldiers, as this was the best option to transport casualties over the long distance that separated them from American shores. When Ivan Byers contracted polio in Italy, he was shipped back to the United States and eventually made his way to a Veteran's Administration Hospital in Brigham City, Utah.<sup>343</sup>

Some polio cases were serious enough to warrant flying the victim over a transatlantic route back to the United States. After Plagemann had recovered enough to be moved from the hospital in Naples, the Navy opted to evacuate him using this strategy. The pharmacist's mate was flown back to the Zone of the Interior by way of Casablanca and the southern route.<sup>344</sup> Although evacuation in this manner did occur, the danger of crossing the Atlantic through the air was enough to ensure that it was rare.

Once back in the United States, the polio victim was then sent to the final stop on his journey of recovery, a rehabilitation center or a general hospital. Often these trips were made via the railroad. Along the way, polio victims often had to contend with unwanted attention from civilians. Lyman L. Bryan reported that his train carried him from Massachusetts to St. Louis, Missouri before he was rerouted south to Arkansas. During this trip, Bryan began to develop a deep resentment towards the attention paid to him by curious civilians who wondered about "a soldier, with no amputations or apparent disabilities, lying helplessly on a hospital litter."<sup>345</sup> This was not the last time Bryan or any other polio victim felt this way about able-bodied civilians who looked on them with wondering eyes.

---

<sup>343</sup> Pauline Steffen ed., *World War II and the People of Northwest Weld County* (Dallas: Curtis Media, 1993), 10.

<sup>344</sup> Plagemann, 104-110.

<sup>345</sup> Bryan, 4.

No evacuation of a polio victim or any sick or wounded serviceman was routine, but some were more extraordinary than others. Such was the case of the rescue of Robert Wesselhoeft, who was serving with the Army Air Forces in the China-Burma-India Theater when he contracted polio on 24 June 1944. While contracting the disease in this theater was dangerous enough, Wesselhoeft's situation was even more so, for he had been on a three-man mission, responsible for photo-mapping the Tibetan Mountains to help with the Allied air-lift of Lend-Lease supplies to Chiang Kai-shek's Chinese Nationalist Forces over what was then known as "the hump."<sup>346</sup>

The *Washington Post* reported that "the first terrifying numbness hit his legs while the three members of the party were in the almost uncharted area near the Tibetan border in western China, 1,000 miles from Calcutta and hope." Even worse, Wesselhoeft began to develop bulbar symptoms, losing the ability to perform the respirations his body needed to survive. His counterparts immediately radioed for help and a rescue group was sent, taking three days of travel by Jeep and mule, when the roads became impassible, to reach them. The group then transported him to a local British mission where he spent the next two weeks being kept alive by artificial respiration performed by the Americans and several Chinese. These caring souls pumped him with a steady rhythm twenty-two times a minute, day and night, for the entire length of the stay.<sup>347</sup>

While medical authorities knew about Wesselhoeft's plight, there was little they could do. Simply transporting materials over the hump was dangerous enough, but to attempt to

---

<sup>346</sup>"Polio Victim's Wife will see him soon," *Atlanta Constitution*, October 8, 1944; Adele Bernstein, "Polio-Stricken Yank Brought Here from Tibet Mountains," *Washington Post*, October 7, 1944.

<sup>347</sup> Bernstein

perform an aerial rescue mission in such a landscape was considered suicide.<sup>348</sup> When a mission was organized, another problem arose; there was no place for the rescue plane to land. With this in mind, a group of coolies and pack animals were sent into the mountainous terrain. These individuals found an accessible area and constructed a temporary runway.<sup>349</sup>

The rescue mission needed one final element, a courageous pilot. Luckily for Wesselhoeft, the Fourteenth Air Force had just the man, Major Fred G. Welsh of West Englewood, New Jersey. Major Welsh was one of the first two pilots to make the trip over the hump in a small, single engine plane.<sup>350</sup> Certainly he did not lack courage. Once the rescue mission was launched, Welsh successfully navigated the mountain passes and landed his small aircraft on the hastily constructed runway. In order to make room for the patient, the pilot tossed out any nonessential items and Wesselhoeft was loaded on board.<sup>351</sup>

While the flight in was perilous, the flight out was even more so. Not only did Major Welsh have to navigate rough terrain, but he had to do so while flying one-handed because his other hand was busy providing the artificial respirations that Wesselhoeft depended on to survive. Despite the circumstances, the Major was successfully able to bring his airplane, himself, and his patient back to the airbase in India alive. Wesselhoeft was then transported to a British Hospital in Calcutta where he spent three months in an Iron Lung.<sup>352</sup>

Like his polio victim counterparts, Robert Wesselhoeft's journey was not over. He still had to be evacuated to the Zone of the Interior. To accomplish this, one last hurdle had to be overcome; Wesselhoeft still relied on his Iron Lung for respiration, and it could not be

---

<sup>348</sup> Barbara W. Tuchman, *Stilwell and the American Experience in China, 1911-45* (New York: MacMillan, 1970), 247.

<sup>349</sup> Bernstein

<sup>350</sup> "Hurtle the Hump," *CBI Roundup* II, no. 45 (July 20, 1944).

<sup>351</sup> Bernstein.

<sup>352</sup> Bernstein.

transferred with him. Therefore, a homemade, transportable respirator had to be constructed out of spare Jeep and aircraft parts. The homemade respirator was a success, and it kept the patient alive as he made his way from India to Walter Reed Hospital in Washington, DC.<sup>353</sup>

Most servicemen who contracted polio were sent to ANGH or the Georgia Warm Springs Foundation for their rehabilitation, depending on which branch of the military they were a member of. Out of the two hospitals, the one in Hot Springs, Arkansas treated the larger number of patients. By World War II, Hot Springs had been a center of healing for over sixty years, its geothermal waters rumored to cure any number of diseases. When Charles Cutter wrote his travel guide to the small town in 1882, he dedicated it “to all the invalids in search of health,” and he hoped that “it may guide them safely to these healing waters, and that *all who come through its influences may be blessed by being restored to perfect health.*”<sup>354</sup> The polio patients who entered ANGH’s doors during World War II were certainly hoping for the same thing.

When a patient finally made his way to a polio rehabilitation center or a general hospital, he normally underwent what was known as “a history of the patient.”<sup>355</sup> This procedure involved doctors examining the patient and charting his muscle function and movement capabilities. Such a procedure was necessary to understand the extent of the paralysis and what muscles the physical therapists should focus on during rehabilitation.

After this initial examination, the patient was sent to the ward for polio patients. At ANGH, most of these patients were housed in ward 3A. Ward 3A became a special place for many of these polio victims, for it was here that they developed lasting bonds with their fellow patients. These wards were also a place to interact with fellow polios, a place where a victim,

---

<sup>353</sup> Bernstein.

<sup>354</sup> Author’s Italics, Charles Cutter, *Cutter’s Guide to the Hot Springs of Arkansas* (St. Louis: Slawson & Company, 1882), 3.

<sup>355</sup> Plagemann, 136.

who more often than not had felt isolated as the only servicemen they knew to contract the disease, became a member of a community. Finally, it allowed these victims to meet other patients who were no longer feeling sorry for themselves and were determined to make the most of their new lives. When Lyman Bryan entered ward 3A for the first time, he reported being met by a group of wheelchair patients, whose freedom of movement must have been both a source of envy and a source of motivation for the new patient.<sup>356</sup>

Shortly after a patient's arrival at the rehabilitation center, he was started on a program of physical therapy. In most cases, especially at ANGH and Warm Springs, this rehabilitation was a hybrid of the method originally devised by Sister Elizabeth Kenny. Like Kenny's method, these hospitals applied "hot packs" to the infected muscles of polio patients. These hot packs were made by running strips of woolen Army blankets through a wringer-type washing machine until they became extremely hot, wringing them out, wrapping them in plastic wrap, and then in another layer of damp wool. These hot wool treatments were given two to three times a day.<sup>357</sup>

Hot pack therapy helped to significantly ease the pain and stiffness that accompanied the disease. However, their application was not the most pleasant experience in the world. Sometimes the warm fomentations were too hot and they scalded the patients as they were placed on their bodies. Later, as the wool began to cool, they began to irritate the patients' skin, causing an almost unbearable itching sensation. Finally, the entire experience was accompanied by the unmistakable odor of hot, wet wool, a smell that most patients never forgot.<sup>358</sup>

Another tenet of the Sister Kenny Method adopted by these hospitals was that of muscle reeducation. At ANGH, this process was known as the "think here method." In this form of

---

<sup>356</sup> Bryan, 4.

<sup>357</sup> Bazzett, 146.

<sup>358</sup> Bazzett, 146; Daniel J. Wilson, *Living with Polio: the Epidemic and its Survivors* (Chicago: University of Chicago Press, 2005), 56.

muscle reeducation, a therapist pointed to a paralyzed muscle and instructed the patient to “think here.” Then the therapist moved the limb in a way that mirrored its natural movement. The goal was to reconnect the pathways from the nervous system to the infected muscles and in many cases some movement of the muscle was eventually achieved.<sup>359</sup>

Unlike the Kenny Method, these hospitals also believed in the benefits of the use of hydrotherapy in polio rehabilitation. As President Roosevelt had discovered in the mid-1920s, the natural buoyancy of this warm mineral water allowed patients to perform exercises that they were unable to perform on land.<sup>360</sup> Polio victims were lowered into the pool where they were instructed to perform tasks by physical therapists that swam in the heated pools with them.

After the patients’ physical therapy had advanced far enough to allow them to escape the confines of their beds, they were often fitted with artificial appliances such as braces that allowed them to practice standing and even walking. As part of their responsibility for the rehabilitation of disabled GIs, the military provided such appliances free of charge. At ANGH, most of these braces were made by Miles W. Parker, a Technician Fourth Grade (T-4) in the US Army and the resident brace-maker at the hospital.<sup>361</sup>

Once equipped with any necessary appliances, patients were able to start practicing walking. Such practice was supervised by physical therapists who assisted the servicemen in standing, walking, and sometimes even climbing stairs. During this practice, the patients were given pairs of forearm crutches and instructed in the finer points of these maneuvers. Such

---

<sup>359</sup> Bazzett, 123.

<sup>360</sup> David M. Oshinsky, *Polio: an American Story* (Oxford: Oxford University Press, 2005), 37.

<sup>361</sup> Edna Yost and Lillian M. Gilbreth, *Normal Lives for the Disabled* (New York: MacMillan, 1945), 79; Bazzett, 354.

practice was not without its difficulties, and many attempts at walking were met with failure and often resulted in violent falls to the floor.<sup>362</sup>

Another form of therapy used frequently at these hospitals was that of Occupational Therapy (OT). Occupational Therapy was used both to occupy patients' minds and to help retrain their muscles and their motor skills.<sup>363</sup> In these OT sessions, servicemen often created arts and crafts which allowed them to build things with their own hands. One of the most popular forms of Occupational Therapy, especially among GIs, was that of building models. These patients were often so proud of their creations that they put them on display for others to view. Some servicemen, like William Bryant, became so intrigued with the hobby that they continued to build models long after they had been discharged from the hospital.<sup>364</sup>

For the patient, the rehabilitation phase was the most important part of their recovery. Many held out hope that through hard work they might be able to regain their old lives. Much of this belief had to do with the way that polio rehabilitation was carried out in the 1940s and 1950s. The rehabilitation of this period was shaped almost exclusively by the Protestant work ethic; the patients were told that if they worked hard enough they would achieve their goals.<sup>365</sup>

The first goal that the polio patient aspired to was to be able to stand without aid. When Lyman Bryan accomplished this feat, he reported that his "joy was unequalled."<sup>366</sup> Certainly standing was a major accomplishment and one to be celebrated, but the real reason for most patients' exuberance over this feat was that it opened doors to the realization of other more important goals.

---

<sup>362</sup> Bill Porteous, Letter to Mable Porteous, in Bazzett, 195-7; Plagemann, 153.

<sup>363</sup> Bazzett, 174.

<sup>364</sup> Scrapbook of William Allen Bryant.

<sup>365</sup> Wilson, *Living With Polio*, 70-1.

<sup>366</sup> Bryan, 5.

Walking, even with the assistance of crutches and braces, was the holy grail of polio rehabilitation. It was the primary accomplishment that signified to the patient that he was no longer going to have to live the life of a paraplegic. Patients also knew that once they accomplished this feat, they would be given greater freedom and sometimes even allowed to take a furlough to see family, friends, or spouses they may not have seen since being shipped off to war. For many of them, it also signaled the end of their struggle with the disease. It is no coincidence that Bentz Plagemann's memoir ends with his first solo steps.<sup>367</sup>

Not every patient was able to accomplish this feat; their paralysis was just too severe. Others who were able to walk quickly realized the sheer amount of effort that it took them to move just a couple of steps. Some of these individuals made the decision to give up trying to walk and instead relied solely on wheelchairs for the rest of their lives.<sup>368</sup>

One of the most significant pieces of the patient's rehabilitation was the staff of nurses, physical therapists, and occupational therapists, nearly all women, who oversaw their treatment and rehabilitation on a daily basis. In the early stages of the disease, polio could strip a normally healthy male of his ability to attend to his own most basic needs. Instead, these individuals had to rely on the nursing staff to do most of these things for them. Iron Lung patients were especially reliant on nurses as their entire bodies below the neck were encapsulated in the large metal tube.<sup>369</sup>

These nurses had to perform a number of duties to ensure that the men were clean and comfortable. At ANGH, the nursing staff often had to bathe the soldiers, rearrange and fluff their pillows, and bring them fresh water. At mealtime, the nursing staff had to wheel the food out to patients who could not get out of bed and feed those who could not feed themselves. These tasks

---

<sup>367</sup> Wilson, *Living With Polio*, 85; Black, 167; Plagemann, 241.

<sup>368</sup> Torp, 356.

<sup>369</sup> Wilson, *Living With Polio*, 48.

were daunting enough for one patient, but the nurses were often taking care of a number of patients at one time. Despite the high volume of work that these nurses were given, many of them genuinely seemed to enjoy working with the polio patients. In April 1945, Bessie O. Cecil, a civilian nurse serving in Ward 3 at ANGH, reported that her “assignment to the polio ward [was] one of the happiest and most satisfying experiences of [her] life.”<sup>370</sup>

Sometimes these ward relationships between patients and nurses developed into romances. Historian Daniel J. Wilson has argued that this was a common occurrence between civilian polio patients and nurses, due to the close interaction between the two groups.<sup>371</sup> ANGH was no different. A number of patients treated at the hospital during World War II went on to marry nurses or therapists they worked with while at the hospital. One explanation for these relationships was certainly that the nurses, working with the soldiers on a daily basis, understood that these patients were still men, despite any muscle use that had been taken from them. The close and often intimate contact shared by these individuals on a regular basis also allowed for these men and women to discover that they had common interests. Finally, nurses certainly made good wives for polio patients as they had the ability and experience needed to take care of a disabled husband.

Convalescence at one of these polio hospitals was not all hard work and rehabilitation. Patients, especially ones who had advanced far enough to be able to move around with wheelchairs or other devices, were treated to a number of different recreational activities. At ANGH, one of the most popular of these activities was the nightly movie series. In 1938, the hospital had been given a 16mm sound “picture projection unit” by the ladies auxiliaries of the

---

<sup>370</sup> Christine C. Summers in “Civilian Nurses” 264; Allard, 4; Bessie O. Cecil in “Civilian Nurses in Army Hospitals,” *The American Journal of Nursing* 45, no. 4 (April 1945), 264, JSTOR.

<sup>371</sup> Wilson, *Living With Polio*, 208.

local veterans' organizations. During the war, this projector was used nightly to allow the patients a bit of relaxation while they enjoyed the latest films.<sup>372</sup>

At ANGH, patients had a number of other recreational options. USO shows frequented the hospital, allowing the servicemen to see some of the most popular entertainers of the day. The hospital also featured an impressive library. However, the most significant contribution to patients' recreation that was made by the hospital staff was the leasing of a lodge on Lake Catherine. Patients were allowed to spend time at the lodge, providing a much needed getaway from the hospital and its environment.<sup>373</sup>

Patients at Warm Springs were also given a number of opportunities for recreation. However, unlike their counterparts at ANGH, the servicemen at the polio hospital in Georgia were treated to occasional visits from the President of the United States. On these occasions, the Navy and Marine personnel that had contracted polio were allowed to put on their uniforms and attend a large party thrown for the occasion. At the party, these servicemen were given the honor of sitting at the table closest to FDR, from which they were able to observe that the President was not much different from themselves.<sup>374</sup> These visits did more to boost the morale of these individuals than any other event.

Due to the extended length of time associated with polio rehabilitation, many of the patients were forced to spend at least one major holiday at the hospital separated from their families. To help ease the loneliness associated with such holidays, family members often tried

---

<sup>372</sup> Committee on Military Affairs, *Investigations on the National War Effort*, 78<sup>th</sup> Congress, 2<sup>nd</sup> sess., 1944, H. Rep. 2092, 7-8; Annual Report of the Army and Navy General Hospital at Hot Springs, Arkansas, 1938, Annual Reports 1930-1939, Record Group 112, Southwest Regional Archives, National Archives and Records Administration, Fort Worth, Texas; Allard, 5

<sup>373</sup> Allard, 5 ; Annual Reports of the Army and Navy General Hospital at Hot Springs, Arkansas, 1938; Bazzett, 295.

<sup>374</sup> Plagemann, 204-6.

to give these servicemen gifts. When William Bryant had to spend Christmas 1944 at ANGH, his mother shipped him a copy of famed war correspondent Ernie Pyle's new book *Brave Men*.

The hospitals also tried to help ease the homesickness of their patients during the holidays by providing them with large holiday meals. At Hot Springs, Bryant and his fellow servicemen enjoyed dishes that included roast turkey, mashed potatoes, and brussel sprouts. For desert they were given fruit cake, hard candies, and an extra ration of cigarettes.<sup>375</sup> While these meals did not replace a holiday at home with family and friends, they were certainly welcomed by all of the patients.

After patients had advanced to the point that they could more or less take care of themselves, they were often allowed a short furlough to visit their families. William Bryant was allowed a furlough in June 1945. On 19 June he boarded an American Airlines flight from Little Rock, Arkansas to Boston, Massachusetts, to visit his family in nearby Brookline. The flight itself cost \$78.14, an impressive sum at the time.<sup>376</sup> It seems that, as a polio patient, he was lucky to have even been allowed on the flight. When Bill Porteous was given a furlough the following year he was unable to book a flight back to his home in Minnesota because the airline did not accept passengers in wheelchairs.<sup>377</sup>

The convalescence period was also a very difficult period emotionally and psychologically for these servicemen who had contracted polio. These individuals underwent a very serious struggle with their own identity. The disease itself was emasculating, stripping young former able-bodied men of the ability to complete even the most private of tasks.<sup>378</sup> Polio

---

<sup>375</sup> Christmas 1944 Menu, Army and Navy General Hospital, Scrapbook.

<sup>376</sup> American Airline Ticket, Scrapbook.

<sup>377</sup> Bazzett, 266.

<sup>378</sup> Amy L. Fairchild, "The Polio Narratives: Dialogues with FDR," *Bulletin of the History of Medicine* 75, no.3 (Fall 2001): 524, Project Muse.

reduced these men to a sense of helplessness that often made the victim feel that the phrase Infantile Paralysis was apt. The reliance on other people to care for them was difficult to accept.

Another aspect of these soldiers' identity crisis came in the realization that they were going to spend the rest of their lives as "a cripple", a part of the community that, at the time, was generally regarded with disdain by the American public. Some of these men had even been guilty of similar prejudices in the past, having "viewed disabled people as deficient and less human." Now these individuals "had to [...] grapple with this profound identity transformation."<sup>379</sup>

For these servicemen, the most difficult part of their new identity to accept had to do with their position as a disabled veteran. Being disabled during World War II was difficult enough for those individuals who had received their disability at the hands of the enemy. In 1945, it was said of paralyzed patients at Nichols General Hospital in Louisville, Kentucky that "if they were able, they would all be willing to go back to the [...] noise, and hell of the battle fields just because it is the only place for a strong American to be."<sup>380</sup>

Servicemen who were disabled due to polio were put in an even more ambiguous situation. To go from being a well-trained soldier to being disabled was a difficult transition. C. C. Allard, a reporter for the *Arkansas Democrat Magazine*, upon touring the polio ward at ANGH wrote that a soldier who had "knifed three Japs with a bayonet he took from one has trouble driving his knife through an individual cereal container."<sup>381</sup> Although these men had been disabled while serving their country, they had not received these paralyzing wounds during combat. Because of this, polio victims were not eligible for the Purple Heart, a fact that only further complicated the patients' identity crises. Like many other GIs with polio, Bentz

---

<sup>379</sup> Richard J. Altenbaugh, "Where are the Disabled in the History of Education? The Impact of Polio on Sites of Learning," *History of Education* 35, no. 6 (November 2006): 710, JSTOR.

<sup>380</sup> Billie Crice in "Civilian Nurses," 263-4.

<sup>381</sup> Allard, 4.

Plagemann had difficulty seeing himself as a war hero; instead he believed that he was an imposter.<sup>382</sup>

Aside from physical and occupational therapy, perhaps the most important part of polio patients' rehabilitation was an attempt to prepare them to be reintegrated back into society. In fact, the resocialization of all disabled GIs was a major concern for Americans in the 1940s.<sup>383</sup> In October 1945, a study was completed on the ability of veterans to readjust to civilian life, and it was found that "those who have the misfortune to be injured, crippled, demented, destitute, or have some other definite handicap, of course have problems, but many others will return to civilian life with very little difficulty."<sup>384</sup> The GIs who had contracted polio were certainly included in the former category.

Readjusting to civilian life was difficult for any polio victim in the 1940s and 1950s. These newly acquired handicaps affected every interaction and altered the attitude of other, able-bodied, people.<sup>385</sup> In order to overcome this social stigmatization, polio patients were taught to change their own attitudes because in the 1940s the able-bodied public was not expected to change theirs. Therefore, polio patients were told to "normalize" or "mainstream", that is, to go about their business as if they were not disadvantaged. They were also expected to play the part of "the good handicapped person." In other words, they were not supposed to complain or show that their disability bothered them.<sup>386</sup>

The first opportunity that the servicemen had to test their ability to adjust to society came with their first trip back into public. For most victims, these trips were "blighted by a mutually

---

<sup>382</sup> Bazzett, 377; Plagemann, 122-3.

<sup>383</sup> David A. Gerber, "Heroes and Misfits: the Troubled Social Reintegration of Disabled Veterans in 'The Best Years of Our Lives'." *American Quarterly* 46, no. 4 (December 1994): 548, JSTOR.

<sup>384</sup> Wilbur B. Brookover, "The Adjustment of Veterans to Civilian Life," *American Sociological Review* 10, no. 5 (October 1945): 579, JSTOR.

<sup>385</sup> Wilson, "A Crippling Fear," 486; Hugh Gregory Gallagher, *FDR's Splendid Deception* (New York: Dodd, Mead & Company, 1985), xi.

<sup>386</sup> Gerber, "Anger and Affability," 6; Gould, xiii; Wilson, *Living with Polio*, 182; Black, 182.

reinforcing cycle of unsolicited, random attention from strangers and self-consciousness that frequently manifested itself in [the veteran's] own public anger, acute embarrassment, and retreat."<sup>387</sup> One of the most telling accounts of an ANGH polio patient's first trip into public comes from Lyman Bryan who, after the trip, wrote:

“Is it wrong to be envious of that GI and his girlfriend as they stroll jauntily along— taking those steps easily, almost disdainfully? Of that flushed two-year-old tangling up sidewalk traffic? A sharp pang of dread assails you and you wonder if you'll always envy children. The thought is borne away in the current of passing interest, for other people are staring, wondering what happened. Machine gun? Shrapnel? Flak? And you realize bitterly that you can't have even that consolation. Only polio— quick, sure, devastating— and permanent. No Purple Heart for Polios.”<sup>388</sup>

For many of these patients, readjustment to their new reality came only when they learned to internalize such feelings.

To help ease the difficulty of their situation, polio victims often adopted jocular personalities. For many of these men, laughter helped take the edge off. Allard noted that the polio patients on Ward 3 “many without the use of arms or legs, or both, and many of them bedridden, were the most congenial among the many classes of patients being treated here.” Lyman Bryan echoed these sentiments when he referred to the men of Ward 3-A as “the happiest group of fellows [he has] ever known, well or ailing.”<sup>389</sup>

This congeniality helped these men form themselves into a community that helped each other deal with their situation. Disability during World War II was a major community building event, evidenced by the spike in the number of single-population disabled veterans' organizations during and after the war. Historian David A. Gerber calls these a “reflection of the difficulties posed by the impairments they represented.” Tom Broderick, a soldier who had lost

---

<sup>387</sup> Gerber, “Anger and Affability,” 15-6.

<sup>388</sup> Bryan, 5.

<sup>389</sup> Plagemann, 180; Allard, 5; Bryan, 4.

his sight during combat, joined other blind veterans to form “an informal organization to help each other adjust to their new realities.” Many of these victims also associated themselves with the military hospital or rehabilitation facility that they had spent the largest amount of time in.<sup>390</sup> In this way, civilian polio patients throughout the 1940s and 1950s were similar to these disabled veterans. In American polio wards communities often developed due to the lengthy stays that were associated with recovery. These communities often resulted in friendships that lasted for the rest of the patients’ lives.<sup>391</sup>

The patients at ANGH were not different from other disabled veterans or polio patients in that they developed a very tight knit community. Lyman Bryan called the group a fraternity of polio patients or “Pi Polio Phi.” However, the official name, and the name that stuck was the Army & Navy Polio Veterans Association (A&Ners for short). The bond that these A&Ners built lasted long after they were discharged from the hospital. Several triennial reunions were held throughout the following decades and boasted significant attendance including the polio patients and their families as well as the medical staff of the hospital.<sup>392</sup>

To coordinate these events as well as to keep up with news from each member of the group, the A&Ners published a yearly newsletter. The newsletter, mailed out during the holidays each year, ran from 1945 to 1999 and its arrival was a joyful occurrence to many of the recipients.<sup>393</sup> A&Ners used the newsletter to give updates on their lives and their families, to alert their friends to changes of address, and sometimes even to inquire about news of specific individuals.

---

<sup>390</sup> David A. Gerber “Disabled Veterans, the State, and the Experience of Disability in Western Societies, 1914-1950,” *Journal of Social History* 36, no. 4 (Summer 2003): 904-5, JSTOR; Tom Brokaw, *The Greatest Generation* (New York: Delta, 1998), 23.

<sup>391</sup> Wilson, *Living with Polio*, 101; Margaret E. Backman, *The Post-Polio Experience: Psychological Insights and Coping Strategies for Polio Survivors and their Families* (New York: IUniverse, 2006), 18.

<sup>392</sup> Bryan, 5; Scrapbook.

<sup>393</sup> Bazzett, 340; A&Ner Newsletter, 1958 & 1959, originals in possession of author.

Newsletters were common among polio communities. Kathryn Black writes that her mother's respiratory center also published its own newsletter written by the patients.<sup>394</sup> In the case of Black's mother, the newsletter seems to have been a therapeutic tool, allowing patients to both record their thoughts and activities as well as be creative, but also as a way for former patients to build hope within their counterparts still undergoing rehabilitation by showing what all they were able to accomplish.

The newsletter published by the A&Ners was originally intended to raise the spirits of the men, having been published during the Christmas season of 1945. The architect behind this attempt was Fran Hallfrisch, one of the head nurses on the polio ward at ANGH. Hallfrisch, perennially one of the patients' favorite nurses, quickly became the glue that held the A&Ners together. Through her tireless efforts in the decades following World War II, the group was able to receive their annual newsletter and enjoy several reunions. Hallfrisch also made it a point to visit members of the group each year and report on her visit in that year's newsletter.<sup>395</sup>

After a soldier had achieved all of the gains that the hospital staff believed that he was going to, the military officially discharged him. William Bryant was separated from the Army on 15 December 1945, a year after he had first arrived at ANGH.<sup>396</sup> Bryant's year of rehabilitation was close to the average rehabilitation time of polio patients during World War II. Despite being discharged from the military, these individuals were still entitled to a number of benefits that they had earned through their service.

First, upon an honorable discharge from the military, these men were eligible for mustering-out-pay. The rate of these payments depended on whether or not the serviceman had served outside of the United States. Those who had served overseas were given \$300, while

---

<sup>394</sup> Black, 115.

<sup>395</sup> Bazzett, 340-2, 351-2; A&Ner Newsletter, 1958 & 1959.

<sup>396</sup> William Allen Bryant, Separation Form, original in possession of the author.

those who had not received \$200. Even the soldier who contracted polio the day after his induction was eligible for this payment.<sup>397</sup>

Disabled veterans were also eligible for a pension from the military. Despite having been knocked out of commission by a virus rather than the enemy, polio patients were still considered as having been disabled in the line of duty and received these funds. These pensions ranged from \$11.50 to \$115.00 a month, depending on the severity of the GI's disability. Some polio patients were ruled 100 percent disabled and were eligible for the full amount, but not all of them were.<sup>398</sup>

In 1959, the A&Ners adopted a resolution that urged the Veterans Administration and Congress to allow for wheelchair bound veterans, which included many of the former polio patients, to be given the same monthly allowance that their more severely disabled brethren received. The major force behind this resolution was Lou Nau, a soldier who had contracted polio while serving with the Army in Manilla in 1945. Nau and the rest of the A&Ners who drafted the resolution obviously felt that their disability was severe enough to warrant full disability pay from the army. The American military did not feel the same way.<sup>399</sup>

After these soldiers were discharged from the military, a new and more difficult phase of their recovery commenced; they began creating new lives for themselves.<sup>400</sup> Some of the men returned home to their families and began a readjustment period that was often quite difficult; many of those without families tried to start them. All of the men had to reevaluate their careers, some attempting to find a job, others trying to find a new one, and still others taking advantage

---

<sup>397</sup> Robert T. Kimbrough and George H. Chapman, *World War I Veteran's Rights and Benefits* (New York: The Lawyers Co-operative, 1945), 23.

<sup>398</sup> Kimbrough & Chapman, 17 & 26; Allard, 4; Frank T. Hines, "Demobilization and the Federal Program of Veteran Aid," *Public Administration Review* 5, no. 1 (Winter 1945): 78, JSTOR; Bazzett, 405.

<sup>399</sup> Army and Navy Polio Veterans Association Resolution, 27 July 1959, original in possession of author; A&Ner Newsletter, 1959; Bazzett, 345-6.

<sup>400</sup> Wilson, *Living with Polio*, 131.

of incentives to receive training or complete their education. Though all of these tasks were difficult, the soldiers had battled through severe paralysis and the threat of death, and they were certainly up to the challenge.

The first obstacle that those individuals who went back to families when they were discharged from the army had to overcome was readjusting to the change of circumstances. Many of these individuals felt as if they were completely different men than they had been before the war and some wondered how their wives were going to react to this change. These concerns were further enhanced by the impairment that the disease had on their ability to be the bread winner, a role traditionally held by the husband. Finally, these men now had to rely on their spouses to fulfill a number of different needs that they were accustomed to fulfilling themselves. Certainly, all of these feelings led to tension within these families.<sup>401</sup> Despite this, many of these GIs had already battled through the most difficult period of their lives. Marital tension was certainly something that they could overcome and many of these polio victims built healthy happy families and stayed with their spouses for the rest of their lives.

Another group of the former polio patients, some married and some not, decided to improve their education following their separation from the military. In retrospect, this proved to be one of the few beneficial aspects of a polio infection, if any aspect of the disease could be called beneficial. “The disability of polio, by forcing young men and women to focus their energies on their educations, enabled some polio survivors to improve their social and economic

---

<sup>401</sup> Thomas Childers, *Soldier from the War Returning: the Greatest Generation's Troubled Homecoming from World War II* (Boston: Mariner Books, 2009), 65; Wilson, “A Crippling Fear,” 485; Edward C. McDonough “The Discharged Serviceman and his Family,” *Journal of Sociology* 51, no. 5 (March 1946), 454, JSTOR.

status.”<sup>402</sup> Bob Dole attributed his success in school to his drive to overcome that he had developed during the rehabilitation following his disabling injury.<sup>403</sup>

These soldiers were given a significant incentive to continue their education, which came in the form of the Servicemen Readjustment Act, better known as the GI Bill of Rights. This act was passed by the House-Senate Conference Committee on 10 June 1944, and President Roosevelt signed it into law on 22 June.<sup>404</sup> In one of its provisions, the GI Bill allowed for veterans to attend college and allotted to them a significant amount of money to be used for tuition. Legislators failed to foresee the popularity of this provision which enticed millions of ex-servicemen to go back to school.

Disabled veterans, including those who had contracted polio, were eligible to receive this benefit without regard to their length of service.<sup>405</sup> Because of this, many of the polio survivors attended school and received degrees that made it more likely for them to find employment after they graduated. However, for these individuals, simply receiving the money did not make attending college easy. “Almost no campus was [handicap] accessible in the fifties and sixties.”<sup>406</sup> For these men, the everyday activity of going to class was a difficult and sometimes dangerous affair, but they pushed through and achieved a high-level of success in the classroom.

For those who did not attend college, finding employment could prove quite difficult. Following the war, jobs, especially for a disabled individual, were scarce. Much of this had to do with prevailing attitudes among employers regarding the employment of the disabled. In a book written in 1945 by Edna Yost and Lillian M. Gillbreath, that was meant to be used to motivate

---

<sup>402</sup> Wilson, *Living with Polio*, 7.

<sup>403</sup> Dole, 259.

<sup>404</sup> Glenn C. Altschuler and Stuart M. Blumein, *The GI Bill: a New Deal for Veterans* (Oxford: Oxford University Press, 2009), 70-1.

<sup>405</sup> Kimbrough & Chapman, 58-9.

<sup>406</sup> Wilson, *Living with Polio*, 190.

the disabled, the authors declared that if a disabled person really wanted to work, he or she would find a way to work. Despite the authors' attempt at reassuring the reader, what comes through is a belief that the unemployed disabled simply did not want to work instead of an acknowledgement of the forces against them. Another attitude adopted among business managers during the 1940s was the belief that disabled individuals were accident prone or incapable of doing the work.<sup>407</sup>

Because of this, there was a high amount of unemployment among disabled veterans, and likely those polio survivors who chose not to pursue an education.<sup>408</sup> This further complicated the polio victims' belief that the disease had dramatically altered their role in life. These servicemen, like Lyman Bryan, asked themselves "Will I ever be normal again?" and "Will I ever be able to earn a living?"<sup>409</sup> At the time, it must have seemed like the world was telling them no.

The American Government offered a few solutions to help alleviate some of the issues surrounding this unemployment. First, the GI Bill offered servicemen unemployment benefits, which these polio victims were eligible to receive. Furthermore, they were eligible for enrollment in a vocational rehabilitation program. This program had been passed as Public Law number 16 regarding the Rehabilitation of Disabled Veterans by the 78<sup>th</sup> Congress. The program called for veterans to receive four years of training while the government paid for their tuition, fees, books, and equipment. Individuals taking advantage of the program were also eligible for a ninety-two dollar maintenance allowance on their pensions.<sup>410</sup>

---

<sup>407</sup> Thomas Childers notes that this was still the trend as late as June 1946, 222-3; Yost and Gilbreath, 10-1; Hines, 79.

<sup>408</sup> Childers, 167.

<sup>409</sup> Bryan, 5.

<sup>410</sup> Kimbrough & Chapman, 53& 62-3; Hines, 77.

While these programs certainly helped, they did not do enough. Officials realized, at the end of World War II, that if the problem of unemployment among the disabled was going to be solved, it had to be done by forcing attitudes of employers to change. In late 1945, Brigadier General Frank T. Hines, the Administrator of Veterans Affairs and Administrator of Retraining and Reemployment wrote “Employment attitudes based on these and similar assumptions which have kept the disabled out of employment are changing, but they must change more.” Hines himself advocated the use of a disabled quota in industry.<sup>411</sup>

President Roosevelt, a handicapped individual himself, also realized the problem that faced the country’s disabled. In 1944, FDR created the President’s Committee on National Employ the Physically Handicapped Week in hopes that by raising awareness the problem might be solved.<sup>412</sup> Despite these efforts, legislation helping disabled individuals from discrimination in the workplace did not come for several decades.

One final difficulty that remained in polio patient’s attempts at building a new life was manifested in the difficulty of finding a house. In the years following World War II, there was an acute housing shortage in the United States, which had started in December 1945 as GIs returned from overseas but had its roots in the Great Depression and the housing bust of the 1930s.<sup>413</sup> While a majority of Americans faced this shortage, it was more difficult for polio survivors. These men had special needs that the average house or apartment did not accommodate. For those who were wheelchair bound or those who walked only through the use of canes, crutches, and bulky metal leg-braces, navigating stairs was difficult if not impossible. Therefore, many of

---

<sup>411</sup> Hines, 78-9.

<sup>412</sup> Harry S. Truman, Remarks at the Annual Meeting of the President’s Committee on National Employ the Physically Handicapped Week, 17 August 1951, National Archives and Records Administration, <http://trumanlibrary.org/publicpapers> (accessed 3 December 2010). s.v. polio.

<sup>413</sup> Childers, 209; William L. O’Neill, *American High: the Years of Confidence, 1945-1960* (New York: Free Press, 1986), 12.

these individuals had to try to find houses that were easier to get in and out of. With the housing market stretched thin, many of these individuals were not able to find housing at all, let alone living arrangements that met these needs.

Many servicemen who contracted polio during World War II went on to be successful in a number of different industries, some even became well-known politicians. One of these individuals was Robert McNamara who served as a Lieutenant Colonel with the Army Air Corps during the war and went on to become the Secretary of Defense under Presidents John F. Kennedy and Lyndon Johnson. While serving at a training facility in the Zone of the Interior in 1945, both McNamara and his wife contracted polio and were treated for the disease at the Army Air Corps Regional Hospital in Dayton, Ohio.<sup>414</sup>

Another polio veteran who went on to a career of distinction was Charlie Bennett. Bennett had contracted polio in the jungles of the Philippines during the major 1945 outbreak on the island chain. He was shipped back to the United States and spent sixteen months in rehabilitation at ANGH. Bennett went on to be elected to the US House of Representatives from the state of Florida and held his seat for forty-four years, which at the time of his retirement was the longest tenure for any representative from Florida and the second longest in the nation's history.<sup>415</sup>

Representative Bennett was best known for the legislation that put the phrase "In God We Trust" on all US currency, but he was also the co-sponsor of the Americans with Disabilities Act. He also served as a member of the House Armed Services Committee for forty years. Perhaps one of the most distinguishing features of Charlie Bennett's congressional tenure was his fiscal

---

<sup>414</sup> Robert S. McNamara and Brian Van De Mark, *In Retrospect: the Tragedy and Lessons of Vietnam* (New York: Times Books, 1995), 9.

<sup>415</sup> Bazzett, 272; Jessie-Lynne Kerr "A Look Back: Longtime Congressman Fondly Remembered on 100<sup>th</sup> Birthday," *The Florida Times Union*, December 13, 2010, <http://jacksonville.com/news/metro/2010-12-13/story/look-back-longtime-congressman-fondly-remembered-100th-birthday> (accessed 3 July 2011).

responsibility, having refused his congressional paychecks during his first years in Congress, returned his Army disability payments throughout his life, and refused to accept pay raises during his last terms in the House. Charlie Bennett provided an excellent example of a polio victim overcoming his disability.<sup>416</sup>

Dwight D. Guilfoil Jr., while not as famous as Robert McNamara and Charlie Bennett, also successfully made his way in the world after battling the paralyzing virus during World War II. Guilfoil contracted both polio and spinal meningitis while serving as a photographer in the Army Air Corps. After being rehabilitated at ANGH, he went on to found the Paraplegics Manufacturing Company in Bensenville, Illinois, a corporation that relied solely on disabled individuals to produce manufactured goods. Through this corporation, Guilfoil not only helped himself but other physically handicapped individuals make a living for themselves and their families.<sup>417</sup>

While these are three extraordinary examples of success stories from polio patients, on the whole, other polio patients did not fair much worse. Historian David Oshinsky writes that surveys show that polio survivors tend to be “better educated than the general population, with higher incomes and marriage rates as well.” That many of these men held down ordinary jobs is important, for it shows that they achieved the normalcy that they had been striving for. When M. J. Torp surveyed those fifty former ANGH patients, she found that most of these men who were eligible for a disability pension from the government were employed which she argues, can be “attributed to the ambition and increasing familial responsibility which characterize the group.” Most of these men went on to live successful and happy lives.<sup>418</sup>

---

<sup>416</sup> Kerr; A&Ner Newsletter, 1958, 7.

<sup>417</sup> “Life is a Cinch by the Inch,” *Family Weekly* (May 1, 1960); James Keating, “Where Workers Ride Wheelchairs,” *The Rotarian* 107, no. 5 (November 1965): 42.

<sup>418</sup> Oshinsky, 283; Wilson, *Living with Polio*, 205; Torp, 357.

Decades after these veterans had been discharged from the military many of them began to experience what seemed like a return of the disease. Gains in muscle use that they had made following the acute stage were disappearing and many that had been able to walk with or without the use of appliances, were once again depending on wheelchairs to get around. When William Bryant reached middle age, he once again became dependent on leg-braces to walk. Such symptoms, passed off as old age by a number of doctors, were disconcerting to these individuals.

Eventually the medical community came to recognize the existence of Post Polio Syndrome (PPS), an unexplained recurrence of polio symptoms among a portion of polio survivors. Those experiencing the syndrome often reported symptoms including increased fatigue, muscle weakness, joint and muscle pain, difficulty breathing, and intolerance to cold. For most individuals, these symptoms might be frightening enough, but for polio survivors they were terrifying because they brought back memories of the helplessness they experienced during the acute stage of the disease. For these individuals paralytic polio and its “physical and emotional consequences shadowed [their] entire lives.” For polio victims to lose what little freedom they had finally achieved forced long buried feelings to resurface.<sup>419</sup>

What causes PPS is unknown. Some medical authorities believe that it is caused by the “overuse of certain muscles and the subsequent breakdown of motor neurons.”<sup>420</sup> In other words, in the polio patient’s attempt to move about, other muscle groups were trained to take the place of the paralyzed ones while still accomplishing their own tasks. After decades of such overuse these muscles simply wear out. Whatever the cause, these individuals, after believing that they had overcome the disease, were finding themselves at its mercy once again.

---

<sup>419</sup> Backman, xvi, 23, & 52; Wilson, *Living with Polio*, 2.

<sup>420</sup> Backman, xvi-xviii.

Polio was the defining moment in the lives of the servicemen who contracted it during World War II. From the acute stage through the patient's discharge from the hospital and the military, the disease was the most significant experience these men had during the war. Polio and its residual paralysis also shaped the lives that these men built for themselves in the postwar world. Finally, decades later, the disease began resurfacing among these former GIs, returning to once again strip away muscle use and to remind them that since the day that they first contracted it in the 1940s, the poliovirus has been a constant companion in their lives.

## CHAPTER 5

### CONCLUSION

William Bryant passed away on 18 April 1999. During the fifty-five years that followed his bout with poliomyelitis he lived a normal life, having married, received his Master of Arts in geography from East Tennessee State College (now East Tennessee State University), fathered three sons, and enjoyed a rewarding career from which he was able to retire.<sup>421</sup> As Bryant aged, he became more reliant on appliances such as leg braces, canes, and motorized carts to get around. He also became less tolerant of the cold, prompting yearly trips to Florida to wait out the Tennessee winters. These symptoms suggest a case of Post Polio Syndrome, but Bryant was never diagnosed with this condition.

Bryant was laid to rest at East Lawn Cemetery in Kingsport, Tennessee, where he was given a full military funeral. His coffin was adorned by the flag of the country that he had gone to Europe to defend; this flag was then folded and presented to his widow. At the end of the service, Taps was played, and Corporal Bryant was given a twenty-one gun salute. Although he had never been eligible for the Purple Heart, Bryant was disabled in the line of duty, and he certainly deserved such a hero's farewell.

Polio had a major impact on the American war effort during World War II, both in civilian life and in the military. In the early 1940s, the disease caused a high level of anxiety in parents, medical officials, and military authorities alike. The war years also witnessed a revolution in the way that polio victims were treated, and American medical researchers made

---

<sup>421</sup> Master of Arts Certificate from East Tennessee State College, William Allen Bryant, original in possession of author.

significant observations that helped bring about the scientific breakthroughs which came in the years following the war and paved the way for the vaccines of the 1950s.

As the number of cases in the United States grew, so did the resources that were necessary to control the disease and treat its victims. These resources might have been difficult enough to obtain during peace-time, but America was not at peace. Instead, the country was in the midst of an all-consuming total-war effort, which required a certain level of deprivation in civilian life. Unlike these other sectors, the cause of polio, thanks to its rising rates, the work of the National Foundation for Infantile Paralysis and Franklin Roosevelt, and the generosity of the American military, never had to face a serious shortage of its much needed funds and supplies.

Polio was also viewed as a serious threat by medical authorities. Not only were they unprepared for the appearance of the disease among their troops during the war, but they also had a faulty understanding of the nature of the disease. Poliomyelitis proved to be very expensive for the military to treat, not just in the cost and time associated with rehabilitation but in the number of its victims who were unable to return to the front because of permanent paralysis. Despite this, the military was able to provide the best available care to the majority of those servicemen who contracted the disease.

Finally, poliomyelitis had a major impact in the lives of those soldiers, sailors, and airmen who contracted the disease during the war. These individuals were forced to undergo a rehabilitation that was often long and painful. Because very few gains in their level of paralysis could be expected, these men then had to try to forge new lives in a society that generally viewed the physically disabled with disdain. That many of these men were successful at leading normal lives is a testament to their strength and determination.

Polio ceased to be a threat to Americans with the introduction of the Salk and Sabin vaccines of the 1950s, and the disease quickly began to fade into obscurity. Although many men, women, and children had spent a significant portion of their lives in fear of the disease, it became easy for the public to forget. Even the March of Dimes, its work complete, turned its attention from polio fund-raising to other diseases affecting infants and children.

Polio was certainly a major aspect of American society in the first half of the twentieth century. Members of the generations who came of age during the polio years may not have thought about the disease in decades, but most seem to have at least one vivid memory of polio and are usually more than ready to talk about it. Some remember a parent's constant concern about the possibility that they and their siblings might catch the disease. Others remember a classmate or a friend who contracted it. Finally, a smaller group of people are intimately aware of the effects of polio, having experienced a family member's struggle after contracting the disease.

In the decades following the 1950s, new generations of Americans, having had immunity to polio since infancy, were almost wholly unaware of the poliovirus and the danger it had posed to their mothers and fathers. For these individuals, the only possible connection they had to the polio years was the acquaintance of a polio survivor. Now, as these survivors age, we are beginning to lose even that connection.

Recently, historians have begun to tell the stories of these years. The fear associated with the disease, the anxiety that a child's summer cold could produce in a parent, and the long hot summers in which children were instructed not to even consider going for a swim. These stories are filled with individuals who had to overcome physical disabilities to make their way in an extremely hostile world, with young children whose only conception of self was the reflection

that they saw in the mirror above their Iron Lung, and of adults, stripped of their self-sufficiency, forced to endure a second infancy.

One motivation for these writers is to make sure that these stories are not lost and share them with these newer generations. In the conclusion to Katheryn Black's work *In the Shadow of Polio: A Personal and Social History*, the author eloquently sums up the need to continue the memory of the individuals who were stricken with this disease by stating, "there is no grove for polio, no memorial for its dead, no quilt with the names of the polio veterans, no place where survivors can gather and mourn."<sup>422</sup>

The experiences of the polio years are also crucial to understanding a critical period in American history. The 1930s, 1940s, and 1950s witnessed some of the most important events of the twentieth century and hanging as a specter over American society during all of it was the poliovirus. Despite the growing amount of scholarship on polio, there are still a number of issues surrounding the disease, its effects, and its role in shaping other events of the subsequent decades that remain to be answered. Polio is certainly a field that can still be mined for information by historians seeking to add a new dimension to their understanding of the twentieth century.

---

<sup>422</sup> Katheryn Black, *In the Shadow of Polio: a Personal and Social History* (Reading, MA: Addison-Wesley, 1996), 263.

## BIBLIOGRAPHY

- Alcabes, Philip. *Dread: How Fear and Fantasy Have Fueled Epidemics from the Black Death to Avian Flu*. New York: Public Affairs, 2009.
- Allard, C. C. "Wounded and Ill Vets Find Haven at Spa." *Arkansas Democrat Magazine*, June 17, 1945, 4-5.
- Al-Samarrai, Noor. "Construction of Controversial House with Garden Roof Will Start this Spring." *The Daily Californian*, November 22, 2010.  
[http://archive.dailycal.org/article/111291/construction\\_of\\_controversial\\_house\\_with\\_garden\\_ro](http://archive.dailycal.org/article/111291/construction_of_controversial_house_with_garden_ro) (Accessed 13 July 2011).
- Altenbaugh, Richard J. "Where are the Disabled in the History of Education? The Impact of Polio on Sites of Learning." *History of Education* 35, no. 6 (Nov 2006): 705-30. JSTOR.
- Alter, Jonathan. *The Defining Moment: FDR's Hundred Days and the Triumph of Hope*. New York: Simon and Schuster, 2006.
- Altschuler, Glenn C. and Stuart M. Blumin. *The GI Bill: A New Deal for Veterans*. Oxford: Oxford University Press, 2009.
- Atlanta Constitution*. 7 December 1941 through 31 December 1945 and 1 January 1923 through 31 December 1928 . s.v. "polio\*" and "Infantile Paralysis". Proquest.
- Anderson, R. S., E. C. Hoff, and P. M. Hoff eds. *Special Fields*. Volume 9 of *Preventive Medicine in World War II*. Washington, DC: Government Printing Office, 1969.
- Annual Reports, 1930-1939. Record Group 112. Southwest Regional Archives, National Archives and Records Administration. Fort Worth, Texas.
- Appleby, Paul. "Paul Appleby." Green Acres Baptist Church Veterans Memorial Project.  
<http://www.gabc.org/assets/1485/applebypaul.pdf> (Accessed July 17, 2011).
- Army of the United States. Separation Qualification Record for William A. Bryant Jr. Original in possession of the author.
- Army Service Record of William A Bryant Jr. Original in possession of the author.
- Backman, Margaret E. *The Post-Polio Experience: Psychological Insights and Coping Strategies for Polio Survivors and their Families*. New York: IUniverse, 2006.
- Barry, John M. *The Great Influenza: The Epic Story of the Deadliest Plague in History*. New York: Penguin, 2004.

- Barton, Betsey. *And Now to Live Again*. New York: D. Appleton-Century Company, 1944.
- Bazzett, Timothy James. *Love, War & Polio: The Life and Times of Young Bill Porteous*. Reed City, MI: Rathole Books, 2007.
- Black, Kathryn. *In the Shadow of Polio: A Personal and Social History*. Reading, MA: Addison-Wesley, 1996.
- Blakeslee, Alton L. *Polio and the Salk Vaccine: What you Should Know About it*. New York: Grosset & Dunlap, 1956.
- Berg, Roland. *The Challenge of Polio: The Crusade against Infantile Paralysis*. New York: Dial Press, 1946.
- Berkowitz, Edward D. *Disabled Policy: Americas Programs for the Handicapped*. Cambridge: Cambridge University Press, 1987.
- Brokaw, Tom. *The Greatest Generation*. New York: Delta, 1998.
- Brookover, Wilbur B. "The Adjustment of Veterans to Civilian Life." *American Sociological Review* 10, no. 5 (October 1945): 579-86. JSTOR.
- Bruenn, Howard G. "Clinical Notes on the Illness and Death of President Franklin D. Roosevelt." *Annals of Internal Medicine* 72, no. 4 (April 1970): 579-91.
- Bryan, Lyman L. "A Polio Victim Tells His Own Story- From the First Symptoms to the Present." *Arkansas Democrat Magazine*, June 24, 1945, 4-5.
- Bryant, William Allen Jr. Postcard to Mrs. William A. Bryant, 1 October 1944. Original in possession of author.
- Carmichael, Ann G. *Plague and the Poor in Renaissance Florence*. Cambridge: Cambridge University Press, 1986.
- Carter, Richard. *Breakthrough: The Saga of Jonas Salk*. New York: Trident Press, 1966.
- Chasens, Eileen R. and Mary E. Umlaut. "Post-Polio Syndrome." *The American Journal of Nursing* 100, no. 2 (December 2000): 60-61, 63, 65, 67. JSTOR.
- Caughey, J. E. and W. M. Porteous. "An Epidemic of Poliomyelitis Occurring Among Troops in the Middle East." *The Medical Journal of Australia* 1 (1946): 5-10.
- Cherne, Leo. *The Rest of Your Life*. Garden City: Doubleday, 1944.
- The Chicago Daily Tribune*. 7 December 1941 through 31 December 1945. s.v. polio\*. Proquest.

- Childers, Thomas. *Soldier from the War Returning: The Greatest Generation's Troubled Homecoming from World War II*. Boston: Mariner Books, 2009.
- Churchill, Edward D. *Surgeon to Soldiers: Diary and Records of the Surgical Consultant Allied Force Headquarters, World War II*. Philadelphia: J. B. Lippencott, 1972.
- “Civilian Nurses in Army Hospitals.” *The American Journal of Nursing* 45, no. 4 (April 1945): 263-6. JSTOR.
- Coates, John Boyd ed. *Communicable Diseases: Transmitted through Contact or by Unknown Means*. Volume 5 in *Preventive Medicine in World War II*. Washington, DC: Government Printing Office, 1960.
- Cohen, Adam. *Nothing to Fear: FDR's Inner Circle and the Hundred Days that Created Modern America*. New York: Penguin, 2009.
- Cohn, Victor. *Four Billion Dimes*. Minneapolis: Minneapolis Star and Tribune, 1955.
- . *Sister Kenny: The Woman Who Challenged the Doctors*. Minneapolis: University of Minnesota Press, 1975.
- Condon-Rall, Mary Ellen and Albert E. Cowdrey. *The Medical Department: Medical Service in the War Against Japan*. Washington, DC: Government Printing Office, 1998.
- Cosmas, Graham A. and Albert E. Cowdrey. *The Medical Department: Medical Service in the European Theater of Operations*. Washington, DC: Government Printing Office, 1992.
- Cowdrey, Albert E. *Fighting for Life: American Military Medicine in World War II*. New York: MacMillan, 1994.
- Cutter, Charles. *Cutter's Guide to the Hot Springs of Arkansas*. St. Louis: Slawson & Company, 1882.
- Daniel, Thomas M. and Frederick C. Robbins. *Polio*. Rochester: University of Rochester Press, 1997.
- Davis, Fred. “Definitions of Time and Recovery in Paralytic Polio Convalescence.” *American Journal of Sociology* 61, no. 6 (May 1956): 582-7. JSTOR.
- . *Passage Through Crisis: Polio Victims and Their Families*. Indianapolis: Bobbs-Merrill, 1963.
- Davis, Kenneth S. *FDR: The War President, 1940-1943*. Random House, 2000.
- Davis, Michael W. R. “Kentucky's 1944 Polio Epidemic.” *Filson Club History Quarterly* 74, (2000): 353-66.

- De Kruif, Paul. *The Sweeping Wind*. New York: Harcourt, Brace & World, 1962.
- Dole, Bob. *One Soldier's Story: A Memoir*. New York: Harper, 2005.
- Faber, Harold K. *The Pathogenesis of Poliomyelitis*. Springfield: Charles C. Thomas, 1955.
- Fairchild, Amy L. "The Polio Narratives: Dialogues with FDR." *Bulletin of the History of Medicine* 75, no. 3 (Fall 2001): 488-534. Project Muse.
- Frisbee, John L. "Valor: All for One." *Online Journal of the Air Force Association* (December 1996). <http://www.airforce-magazine.com/MagazineArchive/Pages/1996/December%201996/1296valor.aspx> (Accessed 14 July 2011).
- Gallagher, Hugh Gregory. *FDR's Splendid Deception*. New York: Dodd, Mead & Company, 1985.
- Gerber, David A. "Anger and Affability: the Rise and Representation of a Repertory of Self-Representation Skills in a World War II Disabled Veteran." *Journal of Social History* 27, no. 1 (1993): 5-27. JSTOR.
- . "Disabled Veterans, the State, and the Experience of Disability in Western Societies, 1914-1950." *Journal of Social History* 36, no. 4 (Summer 2003): 899-916. JSTOR.
- . "Heroes and Misfits: the Troubled Social Reintegration of Disabled Veterans in 'The Best Years of Our Lives'." *American Quarterly* 46, no. 4 (December 1994): 545-74. JSTOR.
- Gilbert, Robert E. "Disability, Illness, and the Presidency: The Case of Franklin D. Roosevelt." *Politics and the Life Sciences* 7, no.1 (August 1988): 33-49. JSTOR.
- Goldman, Armond S., Elizabeth J. Schmalstieg, et al. "What was the Cause of Franklin Delano Roosevelt's Paralytic Illness?" *Journal of Medical Biography* 11, no. 4 (2003): 232-40.
- Goldstein, David M., W. MCD. Hammon, and Henry R. Viets. "An Outbreak of Polioencephalitis Among Navy Cadets, Possibly Food Borne." *Journal of the American Medical Association* 131, no. 7 (June 15 1946): 569-73.
- Gould, Tony. *A Summer Plague: Polio and Its Survivors*. New Haven: Yale University Press, 1995.
- Hallfrisch, Fran. Army and Navy Polio Veteran's Association Christmas Newsletter. 1958.
- . Army and Navy Polio Veteran's Association Christmas Newsletter, 1959.

- Harrison, Mark. "Medicine and the Culture of Command: the case of Malaria Control in the British Army during the Two World Wars." *Medical History* 40 (1996): 437-52.
- Havens, W. Paul Jr. ed. *Infectious Diseases*. Volume 2 of *Internal Medicine in World War II*. Washington, DC: Government Printing Office, 1963.
- Herman, Jan K. *Battle Station Sick Bay: Navy Medicine in World War II*. Annapolis: Naval Institute Press, 1997.
- Hines, Frank T. "Demobilization and the Federal Program of Veteran Aid." *Public Administration Review* 5, no. 1 (Winter 1945): 73-80. JSTOR.
- Hoff, Ebbe Curtis. *Civil Affairs/Military Government Public Health Activities*. Volume 8 of *Preventive Medicine in World War II*. Washington, DC: Government Printing Office, 1976.
- . *Communicable Diseases*. Volume 4 of *Preventive Medicine in World War II*. Washington, DC: Government Printing Office, 1958.
- . *Environmental Hygiene*. Volume 2 of *Preventive Medicine in World War II*. Washington, DC: Government Printing Office, 1955.
- Hoobler, Sibley. *Adventures in Medicine: One Doctor's Life Amid the Great Discoveries of 1940-1990*. Cleveland: Sibley Hoobler, 1991.
- Houck, Davis W. and Amos Kiewe. *FDR's Body Politics: The Rhetoric of Disability*. College Station: Texas A&M University Press, 2003.
- Howard, Brody. *Stories of Sickness*. New Haven: Yale University Press, 1987.
- Humphreys, Margaret. *Malaria: Poverty, Race, and Public Health in the United States*. Baltimore: Johns Hopkins University Press, 2001.
- . "No Safe Place: Disease and Panic in American History." *American Literary History* 14, no. 4 (Winter 2002): 845-57. Project Muse.
- . *Yellow Fever and the South*. Baltimore: Johns Hopkins University Press, 1992.
- "Hurdle the Hump." *CBI Roundup* 2, no. 45, July 20, 1944. <http://cbi-theater-1.home.comcast.net/~cbi-theater-1/roundup/roundup072044.html> (Accessed December 2, 2011).
- Lavinder, C. H. "Poliomyelitis (Infantile Paralysis): The Recent Epidemic in Newark, N.J." *Public Health Reports (1896-1970)* 31, no. 49 (Dec. 8 1916): 3351-3355. JSTOR.

- Lee, Harriet S. and Myra L. McDaniel eds. *Army Medical Specialist Corps*. Washington, DC: Government Printing Office, 1968.
- Libman, Gary. "Churches and Synagogues Offer a Sign for the Disabled." *The Los Angeles Times*, July 26, 1985. [http://articles.latimes.com/1985-07-26/news/vw-5210\\_1\\_deaf-church](http://articles.latimes.com/1985-07-26/news/vw-5210_1_deaf-church) (Accessed 12 July 2011).
- "Life is a Cinch by the Inch." *Family Weekly*, May 1, 1960, 20.
- The Los Angeles Times*. 7 December 1941 through 31 December 1945. s.v. polio\*. Proquest.
- Keating, James. "Where Workers Ride Wheelchairs." *The Rotarian* 107, no. 5 (November 1965): 42-4.
- Kenny, Elizabeth. *The Treatment of Infantile Paralysis in the Acute Stage*. Minneapolis: Bruce Publishing, 1941.
- Kenny, Elizabeth and Martha Ostenso. *And They Shall Walk*. New York: Dodd, Mead & Company, 1943.
- Kerner, John. *Combat Medic World War II*. New York: Ibooks, 2002.
- Kerr, Jessie-Lynne. "A Look Back: Longtime Congressman Fondly Remembered on 100<sup>th</sup> Birthday." *The Florida Times Union*, December 13, 2010. <http://jacksonville.com/news/metro/2010-12-13/story/look-back-longtime-congressman-fondly-remembered-100th-birthday> (accessed 3 July 2011).
- Kimbrough, Robert T. and George H. Chapman. *World War II Veteran's Rights and Benefits*. New York: The Lawyers Co-operative, 1945.
- Klein, Robert. *Wounded Men, Broken Promises*. New York: MacMillan, 1981.
- Kluger, Jeffrey. *Splendid Solution: Jonas Salk and the Conquest of Polio*. New York: G.P. Putnam's Sons, 2004.
- Korson, George. *At His Side: The Story of the American Red Cross Overseas in World War II*. New York: Coward-McCann, 1945.
- Maisel, Albert Q. *Miracles of Military Medicine*. Garden City, NJ: Garden City Publishing, 1944.
- . *The Wounded Get Back*. New York: Harcourt, Brace and Company, 1943.
- Marble, Sanders. *Rehabilitating the Wounded: Historical Perspectives on Army Policy*. Falls Church: Office of Medical History, 2008.

- Marks, Geoffrey and William K. Beatty. *Epidemics*. New York: Charles Scribner's Sons, 1976.
- Marx, Gary. "Dwight Guilfoil, 66, Manufacturing Exec." *The Chicago Tribune*, March 6, 1989. [http://articles.chicagotribune.com/1989-03-06/news/8903240406\\_1\\_Handicapped\\_Paraplegic\\_Veterans](http://articles.chicagotribune.com/1989-03-06/news/8903240406_1_Handicapped_Paraplegic_Veterans) (Accessed 12 July 2011).
- Matthews, Frank P. "Poliomyelitis Epidemic, Possibly Milk-Borne, In a Naval Station, Portland, Oregon." *The American Journal of Hygiene* 49, no. 1 (January 1949): 1-7.
- McDonagh, Edward C. "The Discharged Serviceman and his Family." *Journal of Sociology* 51, no. 5 (March 1946): 451-454. JSTOR.
- McElvaine, Robert S. *The Great Depression: America, 1929-1941*. New York: Three Rivers Press, 1984.
- McNamara, Robert S. and Brian Van De Mark. *In Retrospect: The Tragedy and Lessons of Vietnam*. New York: Times Books, 1995.
- The Medical Department Personnel Manuscript. Arc ID 2485275. National Archives II, National Archives and Records Administration. College Park, Maryland.
- Medical History Files, 1943-1958. ARC ID 581232. National Archives II, National Archives and Records Administration. College Park, Maryland.
- "Milestones." *Time Magazine*. December 9, 1946. <http://www.time.com/time/magazine/article/0,9171,793275,00.html> (Accessed September 21, 2011).
- Nanney, James. *Army Air Forces Medical Services in World War II*. Honolulu: University Press of the Pacific, 1998.
- "Nasal Spraying Seems Best Hope of Preventing Polio." *The Science News-Letter* 33, no. 3 (January 15, 1938): 36. JSTOR.
- National Convention of the Army and Navy Polio Veterans Association. *Resolution of 27 June 1959*. Hot Springs, Arkansas.
- Naval Shore Installations: 8<sup>th</sup> Naval District, Records of the Commandant. Record Group 181. Southwest Regional Archive, National Archives and Records Administration. Fort Worth, Texas.
- Neumann, Donald. "Polio: Its Impact on the People of the United States and the Emerging Profession of Physical Therapy." *Journal of Orthopedic and Sports Physical Therapy* 34, no. 8 (2004): 479-92.
- New York Times*. 7 December 1941 through 31 December 1945. s.v. "polio\*". Proquest.

- “Obituary: William R. Timmons.” *Deseret News*, January 2, 2006.  
<http://www.deseretnews.com/article/1032950/Obituary-William-R-Timons.html>  
 (Accessed 13 July 2011).
- Oman, Charles M. *Doctors Aweigh: The Story of the United States Navy Medical Corps in Action*. Garden City: Doubleday, Doran and Company, 1943.
- O’Neill, William L. *American High: The Years of Confidence, 1945-1960*. New York: Free Press, 1986.
- Oshinsky, David M. *Polio: An American Story*. Oxford: Oxford University Press, 2005.
- “Paul E. Appleby.” Veterans Project, Green Acres Baptist Church.  
<http://www.gabc.org/assets/1485/applebypaul.pdf> (Accessed 10 July, 2011).
- Paul, John R. *A History of Poliomyelitis*. New Haven: Yale University Press, 1971.
- . “Poliomyelitis Attack Rates in American Troops, 1940-1948.” *Journal of Hygiene* 50 (1949): 57-62.
- Paul, John R., W. P. Havens, and C.E. Van Rooyen. “Poliomyelitis in British and American Troops in the Middle East: The Isolation of Virus from Human Faeces.” *British Medical Journal* 1, no. 4355 (June 24, 1944): 841-3.
- “People.” *Time Magazine*. May 24, 1943. <http://www.time.com/time/magazine/article/0,9171,933027,00.html> (Accessed 21 September 2011).
- Plagemann, Bentz. *My Place to Stand*. New York: Farcar, Straus, & Company, 1949.
- “‘Polio’ Germ May Enter Body Though Stomach.” *The Science News-Letter* 25 no. 680 (April 21, 1934): 245. JSTOR.
- Pyle, Ernie. *Brave Men*. New York: Henry Holt and Company, 1944.
- Records of Army Hospitals: Army and Navy General Hospital, Hot Springs, Arkansas. Record Group 338. Southwest Regional Archive, National Archives and Records Administration. Fort Worth, Texas.
- Records of the Bureau of Naval Personnel. Record Group 24. National Archives II, National Archives and Records Administration. College Park, Maryland.
- Records of the United States Army Commanding: Army and Navy General Hospital. Record Group 112. Southwest Regional Archive, National Archives and Records Administration. Fort Worth, Texas.

- Reister, Frank A. *Medical Statistics in World War II*. Washington, DC: Government Printing Office, 1975.
- “Risk of Infantile Paralysis no Greater in Army than in Civilian Life.” *Journal of Nervous and Mental Disease* 101, no. 5 (May 1945): 514.
- Rogers, Naomi. *Dirt and Disease: Polio Before FDR*. New Brunswick: Rutgers University Press, 1996.
- . “Polio Chronicles: Warm Springs and Disability Politics in the 1930s.” *Asclepio* 61 (June 2009): 143-74.
- . “Race and the Politics of Polio: Warm Springs, Tuskegee, and the March of Dimes.” *American Journal of Public Health* 97, no. 5 (May 2007): 784-95.
- . “‘Silence has its own Stories’: Elizabeth Kenny, Polio and the Culture of Medicine.” *Social History of Medicine* 21, no. 1 (April 2008): 145-61.
- Roosevelt, Elliot ed. *F.D.R.: His Personal Letters, 1905-1945*. New York: Duell, Sloan and Pearce, 1948.
- . *F.D.R.: His Personal Letters, 1928-1945*. Volume 1. New York: Duell, Sloan, and Pearce, 1950.
- . *F.D.R.: His Personal Letters, 1928-1945*. Volume 2. New York: Duell, Sloan, and Pearce, 1950.
- Roosevelt, Franklin D. “Address of Behalf of the National Foundation for Infantile Paralysis, 29 January 1944.” National Archives and Records Administration. <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>. s.v. “Infantile Paralysis”. (Accessed 24 June 2011).
- . “Address of the President on the Occasion of his 52<sup>nd</sup> Birthday Anniversary.” National Archives and Records Administration. <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>. s.v. “Poliomyelitis”. (Accessed 24 June 2011).
- . “Address of the President on his 53<sup>rd</sup> Birthday Anniversary, 30 January 1935.” National Archives and Records Administration. <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>. s.v. “Poliomyelitis”. (Accessed 24 June 2011).
- . “Extemporaneous Remarks of the President at Warm Springs Foundation, April 15, 1943.” National Archives and Records Administration. <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>. s.v. “polio”. (Accessed 24 June 2011).

- . “Radio Address of the President Delivered on the Occasion of his 60<sup>th</sup> Birthday Anniversary, 30 January 1942.” National Archives and Records Administration. <http://arcweb.archives.gov/arc/action/BasicMultimediaSearchForm>. s.v. “Poliomyelitis”. (Accessed 24 June 2011).
- Sass, Edmund J., George Gottfried, and Anthony Sorem eds. *Polio’s Legacy: An Oral History*. Lanham: University Press of America, 1996.
- Scrapbook, William Allen Bryant Jr. Original in possession of author.
- Seagrave, Gordon S. *Burma Surgeon*. New York: W. W. Norton & Company, 1943.
- . *Burma Surgeon Returns*. New York: W. W. Norton & Company, 1946.
- Shaffer, Mary M. and Bernard Seytre. *The Death of a Disease: A History of the Eradication of Poliomyelitis*. New Brunswick: Rutgers University Press, 2005.
- Shell, Marc. *Polio and Its Aftermath: The Paralysis of Culture*. Cambridge: Harvard University Press, 2005.
- Shi, David Emory. *The Bell Tower and Beyond: Reflections on Learning and Living*. Columbia: University of South Carolina Press, 2002.
- Sills, David L. *The Volunteers, Means and Ends in a National Organization*. Glencoe: The Free Press, 1957.
- Sink, Alice E. *The Grit Behind the Miracle: A True Story of the Determination and Hard Work Behind an Emergency Infantile Paralysis Hospital, 1944-45, Hickory, North Carolina*. Lanham: University Press of America, 1998.
- Smith, Clarence McKittrick. *The Medical Department: Hospitalization and Evacuation, Zone of the Interior*. Washington, DC: Government Printing Office, 1956.
- Smith, Jane S. *Patenting the Sun: Polio and the Salk Vaccine*. New York: William Morrow & Company, 1990.
- Smith, Jean Edward. *FDR*. New York: Random House, 2007.
- Statistical Health Reports Compiled on SF 86ab. ARC ID 3281856. National Archives II, National Archives and Records Administration. College Park, Maryland.
- Steele, Volney. “Fear in the Time of Infantile Paralysis: The Montana Experience.” *Montana: The Magazine of Western History* 55, no. 2 (Summer 2005): 64-74. JSTOR.

- Steffen, Pauline ed. *World War II and the People of Northwest Weld County*. Dallas: Curtis Media, 1993.
- Stone, James H. ed. *Crisis Fleeting: Original Reports on Military Medicine in India and Burma in the Second World War*. Washington, DC: Government Printing Office, 1969.
- Strom, Ralph J. *The Disabled College Veteran of World War II*. Washington, DC: American Council on Education, 1950.
- Stuart-Harris, C. H. "Viruses of Human Diseases." *British Medical Journal* 1, no. 5295 (June 30 1962): 1779-1788. JSTOR.
- Taliaferro, William H. *Medicine and the War*. Freeport: Books for Libraries Press, 1944.
- Time Magazine*. December 1941 through December 1945. s.v. "polio". <http://www.time.com> (Accessed 10 July 2011).
- Torp, M. J. "Poliomyelitis: Functional Progress Report of Fifty Cases Approximately Five Years Post-Onset." *Physical Therapy Review* 33, no. 7 (July 1953): 351-58.
- Truman, Harry S. National Archives and Records Administration. 30 November 2010. <http://trumanlibrary.org/publicpapers> (accessed 3 December 2010). s.v. polio.
- U.S. Congress. House. Committee on Military Affairs. *A Survey of Army Hospitals with Special Attention Directed to the Care and Treatment Accorded Sick and Wounded United States Soldiers*. 78<sup>th</sup> Cong., 2<sup>nd</sup> Sess., December 27, 1944.
- Van Rooyen, C. E. and A. P. Morgan. "Poliomyelitis: Experimental Work in Egypt." *Edinburgh Medical Journal* 50 (1943): 705-20.
- Verville, Richard. *War, Politics, and Philanthropy: The History of Rehabilitation Medicine*. Lanham: University Press of America, 2009.
- Walker, Turnley. *Rise Up and Walk*. New York: E. P. Dutton & Company, 1950.
- . *Roosevelt and the Fight Against Polio*. London: Rider and Company, 1954.
- Wallace, George T. and William J. West. "Fascial Repair for Poliomyelitic Paralysis of the Abdominal Wall in Adults." *Journal of Bone and Joint Surgery* 29, no. 4 (October 01, 1947): 1031-1043.
- The Wall Street Journal*. 7 December 1941 through 31 December 1945. s.v. polio\*. Proquest.
- War Department. "Basic Field Manuel: Military Sanitation and First Aid". 31 July 1940. US Army Heritage Collections Online. <http://www.ahco.army.mil/site/index.jsp>. s.v. "poliomyelitis". (Accessed 24 June 2011).

- The Washington Post*. 7 December 1941 through 31 December 1945. s.v. polio\*. Proquest.
- Williams, Greer. *Virus Hunters*. London: Hutchinson, 1960.
- Wilson, Daniel J. "A Crippling Fear: Experiencing Polio in the Era of FDR." *Bulletin of the History of Medicine* 72 (1998): 464-95. Project Muse.
- . *Living with Polio: The Epidemic and Its Survivors*. Chicago: University of Chicago Press, 2005.
- . *Polio*. Santa Barbara: Greenwood Press, 2009.
- . "Psychological Trauma and its Treatment in the Polio Epidemics." *Bulletin of the History of Medicine* 82, no. 4 (Winter 2008): 848-77.
- Wiltse, Charles M. ed. *Medical Supply in World War II*. Washington, DC: Government Printing Office, 1968.
- Wiltse, Charles M. *The Medical Department: Medical Service in the Mediterranean and Minor Theaters*. Washington, DC: Government Printing Office, 1965.
- Wooten, Heather Green. *The Polio Years in Texas: Battling a Terrifying Unknown*. College Station: Texas A&M University Press, 2009.
- Yost, Edna and Lillian M. Gilbreth. *Normal Lives for the Disabled*. New York: MacMillan, 1945.
- Zinsser, Hans. *Rats, Lice, and History*. New York: Bantam, 1935.

VITA

JACOB OWEN BRYANT

Personal Date:                   Date of Birth: February 9, 1987  
  Place of Birth: Kingsport, TN  
  Marital Status: Single

Education:                        M.A. History, East Tennessee State University, Johnson  
  City, TN 2012  
  B. A. History and Political Science, University of Tennessee,  
  Knoxville, TN 2010  
  Dobyns-Bennett High School, Kingsport, TN

Professional Experience:       Graduate Assistant, East Tennessee State University,  
  Department of History, 2011-2012

Honors and Awards:             Departmental Research and Conference Travel Grants,  
  East Tennessee State University, 2011-2012.  
  James H. Quillen Scholarship, ETSU, Fall 2011- Spring 2012.  
  Graduate Assistantship, ETSU History Department,  
  Fall 2011-Spring 2012.  
  Tuition Scholarship, ETSU History Department,  
  Fall 2010-Spring 2011.  
  Phi Kappa Phi, Goldenkey, and Phi Alpha Theta  
  Undergraduate Scholarship: William Bryant Scholarship