**INTRODUCTION: IT STARTED WITH SANDSTONE**

Sitting atop the Wittekindsberg hill in the town of Porta Westfalica, in North Rhine-Westphalia, Germany, is a massive monument to an equally massive historical figure of nineteenth-century Germany. Built from 1892-1896, a large bronze statue of William I stands within a gazebo made from sandstone taken from the very hill upon which it rests. Dedicated to the memory of *Wilhelm dem Grossen*, this monument stands for some today as a symbol of German unity. Remnants of an even more recent, yet more divisive German past exist entombed under the monument.

Mining during the nineteenth century left large, open mines in the Wittekindsberg and Jakobsberg hills which are situated on opposite banks of the Weser River from one another. Virtually unused throughout the early twentieth century, the mines found use again in the final years of World War II. Beginning in 1942, concerted efforts were made by the German government to protect the increasingly targeted aircraft industry, and later oil and fuel refineries, by relocating factories to physically separate locations, and in some cases into underground facilities. Forced laborers from nearby concentration camps supplied the labor to convert existing mines into factories or carve new workspaces from the cold, unforgiving stone. One such project was located in the unused mines in Porta Westfalica’s hills, with labor supplied mainly by the inmates from the Neuengamme Concentration Camp near Hamburg and POWs from Russia and Poland. Stone once used to commemorate and memorialize the unification of fragmented German kingdoms was now discarded in favor of the underground space; just as the lives and humanity of inmates was discarded for the labor they could provide. Such projects actualized Nazi desires to eradicate anybody they felt undeserving of life.



*Figure i.1. The Kaiser Wilhelm Denkmal, 2013. Photo by the author.*

This dissertation expands knowledge of German history and the field of historical research in three unique ways. First, nearly all scholarly narratives about the numerous underground dispersal projects throughout Germany, France, Austria, Poland and the present day Czech Republic are written in German. To date, there are only two publications written in English that are dedicated to the history of an underground dispersal project and associated forced labor camps.[[1]](#footnote-2) Some projects are mentioned briefly in several books, most notably those detailing the history of a particular business that was scheduled to move to underground facilities.[[2]](#footnote-3) These works provide a slight, but preliminary, foundation for understanding the underground dispersal projects from both the Nazi as well as a business perspective, but mainly focus on the history of the business and only tangentially narrate the history of the forced laborers. This work increases the English scholarship relating to the history of underground dispersal projects by uncovering the history of the tunnels, camps, and inmates at Porta Westfalica.

Secondly, interviews from over thirty former forced laborers describe the inhumane treatment and unhygienic living conditions that male and female prisoners endured, and the work in the mines and the living conditions at the camps. A comparative study shows the gendered way in which camp and work life were remembered, arguing that the male survivors focused more on the work and violent aspects of camp life, and the female survivors found much more positive things to recall.

Finally, the research materials, the primary and secondary documents, as well as the scholarly writing process, are open to the public through the use of an online repository and scholarly website, and by linking the primary sources in the footnotes to a reproduction in the online repository. It is believed that better research will result if the process of research and analysis and the sources upon which that research is based are open, available, and actively collaborated on.

**Historiography**

**Works about German Businesses**

There are a plethora of works detailing the history of German economy and businesses in Nazi Germany,[[3]](#footnote-4) which provide needed context and understanding about the German economy, issues faced, and options available to German businesses throughout the war. This research uses a discussion of the business perspective on topics such as rearmament and recovery, the miraculous production increases of 1942, the relationship between businesses and the Nazi regime, and the destructive Allied bombing to understand the need for and decisions of businesses to disperse factories into caves, tunnels, and mines. Neil Gregor’s work on Daimler-Benz provides an example of discussing German war production from the perspective of both the Nazi regime as well as a German business, and touches upon the above mentioned topics that lead to a more complete understanding as to why a company such as Daimler-Benz would consider dispersing factories in the first place, let alone to underground locations.

Scholarly works about dispersal and relocation plans for German armaments factories during World War II, specifically the efforts to move factories underground, are severely lacking. Similarly, several major government officials who played a large part in the underground dispersal projects lack any form of bibliography about them. Hans Kammler and Oswald Pohl, two SS leaders directly involved in the underground dispersal projects, and holding high positions and thereby influencing many lives, are mentioned only briefly in many of the books addressing German businesses and Nazi organizations, and would benefit from a more complete look into their involvement in the Nazi regime.

A large and ever growing bibliography on the lives and experiences of those who suffered through the Holocaust currently exists. Because study and training in the nuances of Holocaust research has not been done, this work does not seek to be a Holocaust study, but rather more a social and technical history of the underground factories and the labor force used to create the work spaces. Memoirs and interviews of concentration camp members are used to present the view of the forced laborers. Because there are no personal accounts from businessmen, civilian workers or government officers, government and post-war military documents are used to uncover details of the technical and bureaucratic involvement of businesses.

**Works About Dispersal Projects**

Daniel Uziel’s recent work, *Arming the Luftwaffe: The German Aviation Industry in World War II*, finishes where an earlier work of almost the same name left off (Edward Homze’s, *Arming the Luftwaffe: The Reich Air Ministry and the German Aircraft Industry, 1919-39*), and includes the first work in English to describe and present the underground dispersal projects as a whole. The Luftwaffe was intimately involved in the building of underground factories, not only because they participated in the organization, staffing and oversight of many of the projects, but because their airplanes, fuel, and spare parts were to be built there. Uziel describes with clarity the often confusing national organizational structure that existed to move airplane manufacturing to underground locations. Using sources from the *Bundesarchiv* as well as captured documents in the US National Archives, Uziel is able to piece together the many issues between the competing interest groups between Göring, Speer and Himmler, which resulted in the formation of the Jägerstab, a short-term committee which included a combination of efforts by the Reich Air Ministry and the Reich Ministry for Armaments and War Production to increase production and relocate factories to underground locations bypassing bureaucratic red-tape by allowing their orders to go through immediately.

Claus Reuter’s, *Reimahg, from Sandpit to Armament Factory: History of Hitler’s Secret Underground Factory: with a Short History of the Me 262 and Fw 190* (S.l.: s.n., 1998), is the oldest English text on one of the underground dispersal projects, but is very poorly written. The book seems to consist of a jumble of thoughts, rather than a coherent narrative on the underground project, includes many grammatically incorrect sentences, and a touch of historicism, leaving the impression that this work was quickly done and in no way edited or reviewed. Reuter also is unnecessarily negative towards other historians and their methodology and results. Whereas this can be helpful in showing the weaknesses of an argument or lack of research in order to build a stronger understanding of an issue, Reuter seems to throw around insults just to show how much more he knows than other historians.

In perhaps his most egregious error of hypocrisy, Reuter closes with the argument that there should be a monument, complete with kid-friendly museum, constructed near the Reimahg underground site to show off just the many technical advances and achievements accomplished in building this underground project. Preceding this suggestion, Reuter spent several pages decrying the inhumanity and moral degeneracy of those who forget the “real history of what happened,” and of “those who committed crimes.” Such a museum would seemingly ignore all of the slave laborers that lost their freedom and lives in favor of technology.

A more scholarly work in English is *St. Georgen - Gusen - Mauthausen: Concentration Camp Mauthausen Reconsidered*, by multiple authors[[4]](#footnote-5) including a survivor of the concentration camp. This work takes a much more objective historical approach in the research and includes numerous sources previously unpublished. Along with narrating the history of the concentration camp and projects at Gusen, Austria and the relationship to the more well known Mauthausen, the authors argue that the concentration camp at Gusen was in fact larger than the project at Mauthausen, and was for all intents and purposes an independent camp, not a sub-camp of the St. Georgen-Gusen-Mauthausen complex, as had previously been believed. By uncovering the true nature of the Gusen camp, the authors hope to fill in aspects of the still incomplete historical narrative and provide a groundwork for future historians to more easily understand the “function and operation of Concentration Camp ‘Mauthausen’ as the trifurcated system of the two concentration camps at Gusen and Mauthausen with infrastructure and administrational headquarters at St. Georgen/Gusen.”[[5]](#footnote-6) The work also serves as a cipher to the many complex code names used to keep the project secret from the public and the enemy.

One argument that the authors make early on, is that the use of forced laborers served the dual and complimentary purpose of ridding the Nazi party of political enemies and what they believed to be racially impure people while simultaneously rebuilding the physical world to their design. In the early days after the Anschluss in Austria, write the authors, Himmler was already making visits to project sites in Mauthausen and Gusen to assess the availability, quality, and quantity of resources (stone, sand, space for laborers, and so forth) to enact the already long held business and building plans of the Waffen SS. Relying on works by Jochen Thies and Michael Thad Allen, the authors show that plans to remake and redevelop several cities in the Reich were in place as early as 1925, and that business and economics were as much a part of the decision to enslave political dissidents and the “racially impure” as was the desire to simply remove them from the world.[[6]](#footnote-7) They argue that the Holocaust was just as much an affect of anti-Semitism and official persecution of those not of the “master race” as it was the economic and business plan laid out in order to fulfill desires to rebuild the Reich to the plans of a massively demented Hitler (himself a failed architect).

In order to create an economically independent Waffen SS, as Himmler desired even in the early days of the Reich, he would need a large and inexpensive labor force. Racial ideology provided the (warped) logic to satisfy the need by claiming a large portion of the European population as less than human, and therefore appropriate for enslavement, thus providing a large and relatively free labor source.[[7]](#footnote-8) The authors argue that one of the motivating factors for the mass murder of Jews and others was not only because of their belief that these people were of inferior race, but because they were needed as a labor force to build the new Reich in the format designed by a crazed Hitler. Nazi leaders realized that the current capitalist model of business was not going to supply them with the manpower to win the war nor rebuild the cities in the length of time they wanted. They needed to abandon capitalism and devolve to fascism and the use of slave labor. The Nazi policy of forced labor is summed up succinctly by historian Rainer Fröbe who writes that concentration camps were set up to with *Vernichtung durch Arbeit* (destruction through labor) as the goal. This research shows that many inmates did indeed succumb to death through work.

Regardless of the possible reasons for using forced labor, the authors show that “murder would remain the shared ultimate goal of all segments of the SS”[[8]](#footnote-9) as seen in the multiple acts of senseless beatings, malnourishment, brutal working and living conditions, and every opportunity taken by SS guards to shoot concentration camp inmates. As an ultimate goal, the authors hope this book will bring to light the experience of thousands of individuals whose life was extinguished at the Gusen Concentration Camp.

While English scholarship in the area of underground dispersal projects is only now increasing, the German scholarship has many examples which focus on individual projects, mainly narrating the associated concentration camp and its victims’ role in creating the underground space and subsequent working of factory machinery.[[9]](#footnote-10) Most notable are the works by Jens-Christain Wagner, director of the Mittelbau-Dora Concentration Camp Memorial, Bertrand Perz, Rainer Fröbe, and Christine Glauning. Many more works exist in Polish, French and Czech, but due to lack of knowledge of these languages and time constraints, these books can only be mentioned, and their research left uncovered.

An unconventional source for historical works is found on the World Wide Web. Web pages provide an inexpensive and low barrier to entry for personal publishing. Many arguments exist about the quality and reliability of research presented on personal websites, forums, and publicly edited encyclopedias like http://Wikipedia.org. The existence of many websites about underground dispersal projects is proof that there is interest among the general public about such a topic. In particular, this research notes four websites with content specifically revolving around the tunnel projects at Porta Westfalica.[[10]](#footnote-11) Many other websites provide information regarding other dispersal projects, both from an individual or group effort at an amateur level, as well as professional sites run by memorial groups located at project sites. Pages on city and county websites that address their history of concentration camps and tunnel sites are also of interest.

**Works about Porta Westfalica**

Only three scholarly works have been written about the dispersal project and forced labor camps at Porta Westfalica. A dissertation in 1984 written by Reinhold Blanke-Bohne at the University of Bremen, *Die unterirdische Verlagerung von Rüstungsbetrieben und die Außenlager des KZ Neuengamme in Porta Westfalica bei Minden*, provides a scaffold upon which to build the chapters describing the creation of the tunnel project at Porta Westfalica. Other research has been published by Rainer Fröbe,[[11]](#footnote-12) most notably his *“Vernichtung durch Arbeit”?: KZ-Häftlinge in Rüstungsbetrieben an der Porta Westfalica in den letzten Monaten des Zweiten Weltkriegs*. A 2006 masters thesis by Thomas Lange also exists.[[12]](#footnote-13) Excerpts from an as-yet-unfinished dissertation by Jens-Christian Hansen, are published in a Danish book, and detail the camp for men in the Hotel Kaiserhof in Barkhausen.[[13]](#footnote-14) Books by Jochen Bergmann, who writes with the intent to prove the Nazis were involved in creating perpetual energy devices, atomic weapons, and other implausible and fantastical creations, are tangentially important. The only real scholarly benefit of Bergmann’s books are the color photographs of the tunnel systems which he visited in the 1980s.[[14]](#footnote-15)

**Works by Survivors**

Several books written by survivors of the concentration camps at Porta Westfalica are used in this research. *“Das Leben ist schön!”: Uberlebensstrategien eines Häftlings im KZ Porta* by Pierre Bleton, provides the earliest published account of inmate life in Porta’s concentration camp. The first and most immediate benefit of this work is the very brief, introductory explanation of the camps and tunnel projects at Porta Westfalica, which describe the location of the concentration camps and project sites, the type of work carried out by the laborers, the number of inmates, and the companies that were supposed to occupy the underground factories when completed. This memoir of Pierre Bleton is an extraction and translation from Bleton’s complete memoir in French, which covers his entire experiences in the various concentration camps throughout the war.

This work was the product of seven students and their teacher at the Municipal High School Porta Westfalica as an entry in the national school competition for civic education. Work on the text was followed by articles in the local newspaper to bring attention to the experiences of the concentration camp inmates, and the organization of a seminar that included Hermann Langbein, a fellow prisoner and prolific writer of his experiences, as guest. They also confronted the local government to be more proactive in accepting their city’s heritage with the creation of an informative brochure about the camps and inmates, a section of which was to include an excerpt from Pierre Bleton’s memoir, for the city to distribute.

After translations of Bleton’s memoir for the brochure returned an unexpected “irritatingly optimistic” outlook on his experiences, the students felt that the text did not deserve to be shrunk to eight pages of a small brochure. They therefore proceeded to raise funds to turn the translation, with accompanying review of the memoir by historian Rainer Fröbe, into the present book. In a very mature realization of their generations role in coming to terms with their heritage, these young adults wrote how this work had changed their lives.

Why did we engage in the Nazi past, here and elsewhere, for one and a half years? Perhaps out of fear of repeating the past? Or out of uneasiness caused by confronting the question of how we might have behaved at that time? Don’t we act just as cowardly in similar, seemingly innocent situations? None of us has the right to claim he would have acted differently than the majority of the population—namely, do nothing! If we can’t be sure that we would have acted differently, we can’t be sure of a repetition, then for the sake of the future we must deal with this past. (Bleton, Pierre. *“Das Leben ist schön!”: Uberlebensstrategien eines Häftlings im KZ Porta*, 77-78.)

In practical terms, the students determined that they must not, could not, sit idly by when comments were made about the “merits” of the Nazi regime, or, as one student experienced, allow students to go unchallenged when saying that a disabled student should be “gassed.” The students changed through this experience; they became more aware, even hypersensitive to their national past and the issues involved in living with that past. Can a society, they ask, become too cautious of the adaptation of small but unnecessary restrictions of freedom and responsibility, to adapting to “immutable constraints” and to silence? *“Das Leben ist schön”* is a valuable book for the remembrances of a survivor, the critical analysis of the memories by Rainer Fröbe and the insights gained through the group of students who organized the publication of this work.

*Survival in the Organization: Gunnar Hjelholt Looks Back at the Concentration Camp from an Organizational Perspective*, by Benedicte Madsen and Søren Willert is a very light foray into the remembrances of psychologist Gunnar Hjelholt who survived the labor camp at Porta Westfalica and his thoughts on the concentration camp system as an organization from the viewpoint of an applied social psychologist. It is light in the sense that the issues and events are not discussed or probed in any real depth. In interview format, the authors pose questions, and Hjelholt’s responses are given. No further inquiry or explanation is given on most accounts. Not intending to be a scholarly treatise on the Nazi concentration camp organization, the book only briefly touches on Hjelholt’s professional knowledge of the psychology of large groups and systems. In only a few short paragraphs do we see Hjelholt’s analysis of the Nazi concentration camps as a system, and that only to say that, all inhumanity aside, it was a nearly perfect system of organization in that the members regulated themselves. “The concentration camp system is clear, transparent, and effective,” Hjelholt explained. “It controls itself using the oppositions found between the various groups, vertically and horizontally in the system. Every position is connected to privileges.”[[15]](#footnote-16) The inmates themselves were the ones who enforced the rules of the system. The opposition between national groups within the inmates and between the inmates and their captors kept the system stable and productive. This small book (really more like a transcript of an interview through letters) provides more questions than answers, and simply exists as a brief glimpse or gateway into the deeper philosophical and psychological discussions that could be had about the organizational structure of concentration camps under the Nazi regime.

More recent works by survivors have been published including *Anus Mundi* *: Fünf Jahre Auschwitz* by Wieslaw Kielar, *A Final Reckoning: a Hannover Family’s Life and Death in the Shoah*, by Ruth Herskovits-Gutmann[[16]](#footnote-17), *Resistance Fighter: a Personal History of the Danish Resistance Movement*, by Jørgen Kieler, and *Die Stärkeren* *: Ein Bericht Aus Auschwitz Und Anderen Konzentrationslagern*, by Hermann Langbein. This dissertation also utilizes the written transcripts from interviews and government questionnaires which have not been utilized in other research or published.

**Works on Digital History**

Digital history is still in a nascent form, yet several books have been written to address the issues and options available for doing history in a digital age.[[17]](#footnote-18) This research makes use of the knowledge these and other works provide as it seeks to do just that, write and present history using digital tools. Foundational books, like Cohen and Rosenzweig for putting historical content on the World Wide Web, and Gitelman for arguing that questions about how to use new media are answered in the ways old media was adopted, are supplemented by a plethora of articles and blog posts. The number of influential scholars who elaborate, debate, argue for and against, and think about and share digital humanities, and even digital history specifically, are too numerous to mention. They have in many ways influenced this research, most specifically in opening new paths for visualization, representation, quantifying and exploration what is possible outside of a traditional text monograph.

**Methodology**

Dealing with memory is an important aspect of historical research. Much of history is due to what someone remembered, either recalled later or wrote at the time. Arguably, government documents, newspaper articles, books, and any object created by mankind is a form of memory. Printed textual documents are created by humans to record something those humans felt important to be remembered. Art work is memory; it is the physical embodiment of the memory of the artist, his or her ideas, emotions, feelings and desires either stirred from the past or present as the artist creates. But memory is contentious when applied to historical research. Historians attempt to enact their craft, recreating the past, as a science, but without the ability to deal with absolutes. Even scientific absolutes can be debated, but for historians, the conflict is on the surface. Mathematicians deal with numbers, one plus one equals two. Historians deal with interpretations of memories which are incomplete and fallible.

Many historians have and continually grapple with the issues inherent with historical research and memory. When dealing with Germany’s past and the Holocaust, memory becomes even more contentious. Issues arise around conflicting and altered survivor memories. Whose recollections deserve more merit and attention by the historian; the victim, bystander, or perpetrator? What can be done when two survivor accounts conflict? Does modern media attention to the Holocaust story manipulate and change survivor memory? Many historians have written about the role of memory in Holocaust studies and attempt to answer such questions, most notably Saul Friedländer, Rudy Koshar, and Alon Confino.

Three chapters of this work are based on memoirs, interviews, and written reports of survivors. They utilize the memory of the survivors to reconstruct a representation of life as an inmate in the Porta Westfalica camps, and the work done in the factories and mines. Glaringly absent from this reconstruction are memories of German civilians, civilian workers, and German guards, because so few records exist from those who lived in this time and place, even from survivors of forced labor.

This work uses several methodologies typical of historical work, but also seeks to incorporate ideas from different fields such as geography and the computer sciences. This research takes the approach of a micro-history to illuminate Germany’s use of underground relocation projects. It would be much too big a project to catalog and narrate in any meaningful detail all of the more than thirty underground dispersal projects undertaken by the Waffen SS and the Jägerstab and Geilenbergstab, let alone the many other similar projects not controlled by this branch of the Nazis. Of necessity, then, this research focuses on one single project in Porta Westfalica.

**Visualizations**

Usage of graphs and maps enhance the understanding of gender differences between how male and female survivors recalled their experiences in Porta Westfalica. It is hoped that through this use of technology, the project shows how our understanding of the past is augmented and enhanced by forms of new media in that new ways of looking at data require historians to ask different questions and perhaps come to different conclusions. Information about the digital aspects of the project, including analytical and scholarly writing, as well as digitized source materials, are available at http://nazitunnels.org/.

What does new media and digitization provide to historical research? Does it enhance or provide a different experience, or way to research that wasn’t there before? Some historians, such as David Staley, argue that history can and should be told through other mediums besides linear sequential text. Just as the vibrations of sound are altered depending on what medium they travel through (air, water, wood, etc), the result of putting history through a different media would produce a different way of understanding that history.[[18]](#footnote-19) Most historians, insist Staley, use computers “to laterally transfer textual culture from paper to screen.” This, he says, is like using a car only to park.

Other sciences, like architects, use computers not to show pictures of their buildings as a two dimensional blue print, but to design and create multiple levels of abstraction for understanding and developing a building.[[19]](#footnote-20) They use the technology of the computer to enhance and understand their plans in new and different ways. Images or diagrams can represent data, history, and information in different and sometimes better ways than just words. Images and diagrams enhance the analysis and provide information in much quicker and in more succinct ways.[[20]](#footnote-21) The old adage that a picture is worth a thousand words is applicable to historical research. “Where writing emphasizes sequence, unidimensionality, and linear chains,” argues Staley, “visualization enables simultaneity, structure, and association.”[[21]](#footnote-22) When viewing a diagram or image, the observer is able to comprehend multiple scenarios, time frames, and associations. With text, each explanation must be taken in one section at a time. Visuals, as it were, allow the observer to process multiple paragraphs in one glance.

In a recent blog post, historian Fred Gibbs noted the need for historians (and humanities scholars in general) to be conversant and critical of visualizations. Visualizations are increasingly computed, not just designed, and as such have inherent arguments. These nuances of visualizations need to be recognized and addressed by the creators (historians and other humanities scholars) and understood and critiqued by the consumers (other scholars). “Visual criticism is not a digital [humanities] problem, it is a [humanities] problem.”[[22]](#footnote-23)

Maps provide another alternative medium to text for the understanding of history. Geography professor John Pickles, in his work *A History of Spaces*, describes the many different levels with which to use maps. While speaking to geographers, his remarks show how historians can view and interpret maps in unique ways. “At one level, the map and the mapping exercise can be seen as the careful scaling and coding of worldly objects and spaces for particular purposes,” states Pickles, “the topographic map enables accurate assay of and navigation through the landscape; the geological map identifies regions of similar surface and subsurface rock, along with boundary features such as faults and fracture zones; the architectural plan identifies the inner and outer spaces of built objects to guide the builder, lawyer and owner; and the street map identifies property boundaries, public infrastructure and official names for buildings, streets, and public and some private spaces.”[[23]](#footnote-24) Maps of this sort tell us information. When this information is viewed in relation with time, it becomes valuable for those who study the past. Indeed, Pickles shows that maps form a way to see what is important and unimportant to the cartographer during that time. Just as historians must decide what information is most important to include in their writings, a cartographer must decide what icons and information, what lines and spaces, are most important to his or her story.

What is historical writing but attempting to recreate past realities with words? Cartography is very similar. Cartographers try to recreate reality through symbols; lines, shapes and images. It is telling on the history profession that we are not included in Pickle’s list of fields that are increasingly seeing the importance of maps in their study. Maps provide a “new analytics and a new view of modeling reality.” He continues, “It is comparatively easy to visualize maps as representation models of the real world, but it is important to realize that they are also conceptual models containing the essence of some generalization about reality. In that role, maps are useful analytical tools which help investigators to see the real world in a new light, or even to allow them an entirely new view of reality.”[[24]](#footnote-25) Writing history is precisely what Pickles defines as maps, albeit historians seek to simulate a past reality. Maps can provide, just as they do for cartographers, an analytical tool for seeing past realities in a new light. One way maps help shed this new light is by allowing historians to discover new relationships.[[25]](#footnote-26)

This research makes use of visuals in the form of charts, diagrams and maps. Maps in chapter four compare two possible marches made by female prisoners on their way to Porta Westfalica. They provide a visual and more impactful display of distance traveled than mere numbers or words in text. Charts in chapter five allow for a much easier way to compare the accounts of events and locations within the camps. Specifically, the charts and scatter plot showed a difference in how men and women looked at their experiences by their focus on events.

**Open Source History**

Our modern society benefits from the results of the Open Source software community (much of the Internet and smart phone software runs on Open Source software), where the underlying code is available for all to see, use, redistribute, and improve upon. Historical scholarship can benefit from a similar open model. Two supporting aspects, two sides of the same coin, seem to make an Open Source project successful; availability and collaboration. The code must be available for others to work with it, and improvement happens when many people work on the same code. This project will focus on only one side of the coin, making the resources and research available. All of the research and resources used in this research are made available at an accompanying website and online repository. To facilitate the link between the work and the sources, all footnotes that reference a primary source contain an HTTP link to the corresponding primary source in the online repository. Research and analysis are improved when other researchers can see the source of arguments and information and provide corroboration or contradiction. Making the sources available online and providing a link to the sources eliminates the need for collaborators to do much of the time and labor intensive work of locating the primary source for themselves, a process that often discourages fellow researchers to cross check the original argument. This dissertation stands as an example of a new model of scholarship, with open and available sources, and argues the value of an open source model of scholarship.

An excellent example of open historical research is found in online discussion forums; usually created by enthusiastic individuals who have an interest in World War II history. The process of doing history, piecing together a narrative of the past from facts found in documents, is seen on such forums. On one such forum, hosted at [axishistory.com](http://axishistory.com/), has very thoughtful and academic discussions. A discussion board dedicated to uncovering the effects of area bombing in Germany prior to 1944 provides such an example. Eight pages containing 115 posts (<http://forum.axishistory.com/viewtopic.php?f=54&t=164883>) discuss whether the allied bombings had any effect on German war production prior to 1944. As is usually the case in such open online forums, the discussions are littered with concrete evidence and fact based arguments, but also include nitpicking about semantics and petty passionate personal attacks against perceived opponents. These discussions show that the history being researched is relevant to modern times and to a wider audience than the academic scholar. While not extensively used in this work, there are at least six websites which focus on the underground factories at Porta Westfalica.[[26]](#footnote-27)

**Sources**

This research builds a narrative based on primary documents found in the Provincial Archives of North Rhine-Westfalia Department of East Westphalia-Lippe in Detmold, and transcripts from interviews of twenty-one survivors found in the Neuengamme Concentration Camp Memorial Archive and the USC Shoah Foundation interview repository, as well as military and civil records from the National Archives in Berlin-Lichterfelde, the municipal archives in Minden, the National Archives in Great Britain, and the National Archives in the United States.

As surely every historian has experienced, they could always use another month, or year, in the archives, and always more time in writing a work of history. With a generous Hunt Fellowship from the American Council on Germany, a very successful and helpful research trip to Germany was made in the summer of 2013. Unfortunately, this trip was limited to only 28 days. A final research trip was funded by the University of Virginia Library in May 2015 to present preliminary research on the inmates in Porta Westfalica at an event commemorating the 70-year anniversary of the end of the war. Vital connections were made with fellow researchers, descendants of survivors, and even eye witnesses to the atrocities of 1944-45. This visit was pivotal in order to gain a greater understanding of the scope and organization of the Nazi project to move factories underground. The incompleteness of this research is acknowledged, compared to what could have been accomplished about this topic. As all research in effect is, this is an incomplete history, but it is the history that can be written with the sources and time available. This work functions more like the sketch of a single branch from a tree, rather than a detail of every branch and leaf, and will serve as a structure or framework upon which to construct a more accurate account, hopefully in collaboration with other interested scholars and individuals. The limitations and exclusions of this work are acknowledged.

**Chapter Outlines**

Chapter one discusses the wartime events and government decisions that led to the use of underground relocation programs. This chapter relies heavily on secondary sources for describing the wartime bombing practices leading to Big Week in February 1944, which became a pivotal turning point in German strategy, and the Nazi response to Big Week as they moved from an offensive military position to a decided defensive reactionary position. The different options considered and used for protecting German factories from Allied bombing are also briefly discussed in this chapter. This chapter ends with a look at the use of forced labor in Germany, again relying on secondary material to layout some of the events and decisions made by Nazi leadership that lead to the creation of the underground factories at Porta Westfalica, the concentration camps constructed nearby, and use of concentration camp prisoners for labor. While not original in research, this chapter provides essential background for understanding the reasoning behind support for the underground relocation programs.

Chapter two moves the research from the secondary to the primary sources surrounding the businesses and physical aspects of the underground spaces at Porta Westfalica. This chapter relies mainly on two documents created shortly after the war by the United States Strategic Bombing Survey and the Combined Intelligence Objectives Sub-Committee. Official records from the businesses and the German government were either destroyed as the Allied forces approached the area, or remain undiscovered in unknown repositories or locations. This chapter begins by describing the landscape of underground relocation projects concurrently being developed with the projects at Porta Westfalica and then moves to a detailed description of the technical aspects of Porta Westfalica’s three underground factory systems.

Chapter three focuses on the experiences of the men who worked predominantly in the Dachs I system and were imprisoned at the Kaiserhof Hotel in Barkhausen (a district of present day Porta Westfalica), and near the entrances to the tunnels. This chapter utilizes experiences from survivors to piece together the prisoner hierarchy, the life as a forced laborer, and the work, camp life, acts of violence, deaths, and mental and physical health of the prisoners.

Chapter four relates the experiences of the women prisoners who were encamped either in Hausberge or inside the Hammerwerke underground systems, and worked exclusively in the Hammerwerke factories. This chapter also relies on survivor testimonies taken during interviews in the 1990s, and a few legal depositions written shortly after the war in 1945.

Chapter five looks at the geo-spatial elements embedded within the interviews and testimonials of the men and women survivors. Focusing on the places mentioned by survivors exposes not only the places and events most mentioned, but also a distinct gender difference in the types of places and events that were recalled.

The dissertation ends with a concluding chapter that serves as a very short epilogue to the inmates and to the town of Porta Westfalica as the Allied forces advanced on the town in April 1945, and the fate of the tunnels since the end of the war. In several of the interviews survivors contemplate the lessons that they have learned and hope that others learn from their experiences. These reflections, combined with thoughts while discussing the role of monuments and commemorative museums and archives with Dr. Jens-Christian Wagner from the Mittelbau-Dora Concentration Camp Memorial Archive provide a context to place the role of this study in a larger German and global history.

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