Preserving Camp Upton: World War I Uniform's

Nadia Abrego, Environmental Protection Division, Sweet Briar College, Sweet Briar, VA 24595
Allison McGovern, Environmental Protection Division, Brookhaven National Laboratory, Upton, NY 11973

Abstract

Before Brookhaven National Laboratory began constructing their laboratory, the site was a military training center known as Camp Upton. In preparation for World War I, the camp trained and sent 40,000 soldiers to Europe, including the 77th Infantry Division. Several articles of soldiers' standard-issue military uniforms have been donated by descendants and are now curated by Brookhaven Lab's Cultural Resources Management Program. The uniforms provide a historical record in military identity by sharing a soldier's disposition. This project analyzes primary materials, the origin of raw materials, manufacture location, military function, and cultural insignia to understand the experience of a World War I soldier. Historical photographs, archival sources, and museum databases were consulted in identifying the damage of the uniform items. Every piece of the uniform reported by the condition reports is based on its material composition for further analysis. Integrating historical research with materials analysis and conservation recommendations, this project supports the mission of Brookhaven's Cultural Resource Management Program by preserving both the tangible and intangible heritage of Camp Upton. Professionally, this project has strengthened my skills in material analysis and artifact preservation planning. Through the development of a comprehensive catalog and treatment recommendations, I have gained hands-on experience in managing cultural resources in a historically sensitive context.

Introduction

Brookhaven National Laboratory retains a collection of Camp Upton artifacts and memorabilia to remember its military history, which it stewards in accordance with the National Historic Preservation Act (NHPA). This law creates a framework for managing and stewarding cultural resources at the Brookhaven Lab site. Items from the Camp Upton collection are occasionally exhibited on site or loaned to local history museums and historical societies for short-period temporary exhibits. The purpose of this research project is to provide recommendations that ensure the vitality of the Camp Upton collection, particularly the textile uniform pieces, seeking to further the lifespan of the collection.

After the United States joined the World War in 1917, a nickname was designated for millions of young men who trained, then later were deployed to Europe. The nickname stuck, leading to the soldiers being labeled as the "Doughboys." The Doughboys, at first, were equipped with British and French gear, such as the metal bowl-shaped helmet known as the "Brodie helmet," while wearing an M1918 tunic made out of olive drab wool. Soldiers were also equipped with gas masks, storing them in military-issued canvas bags. Brookhaven National Laboratory received as a donation of a complete Doughboy uniform which is now stored in the Chemistry Building, requiring special authorized access due to the fragility of the textile. As the years proceed, artifacts like the Doughboy uniform demand a routine of care and diligence to ensure the preservation of Camp Upton's collection.

The WWI uniforms are textile artifacts, and due to their material composition, they are in their most fragile state. Without preventative measures, an artifact's curatorial facility can lose artifacts due to risk factors of deterioration. However, deterioration can be minimized and an artifact's condition stabilized with the proper preventative steps. Some examples of deterioration include the beginnings of pest damage (such as cloth moths), fraying of clothing, and the use of improper storage materials for WWI textiles. These deterioration risks can lead to the artifact

losing its integrity, including historical value, and limit the information that can be obtained from it. Simple remedies can mitigate these factors by changing and providing suitable material support. Ultimately, textiles are important primary sources of history, identity, and memory. These recommendations ensure that the vital resources of the Camp Upton collection remain accessible in the years to come.

This research utilizes condition survey reports f to assess the existing conditions of the collection. Usually, in the museum studies field, condition survey reports are performed before and after an object has been loaned to an exhibition or to another museum. However, in this project, the reports are done for artifacts currently in the collection. The condition surveys document existing conditions and identify potential problems, such as fading, fraying, pest activity, brittleness, staining, mold, and deformation. The observations are recorded in the reports through descriptions and photographic documentation. The condition survey reports, and preventative conservation research provide a baseline of information from which recommendations for best preservation practices are formed.

The condition survey reports include the artifact's identifying numbers, such as a military-issued number stamped on the textile. They also document the maker and manufacturer label on items The condition survey reports document important factors like material composition, environmental monitoring, and evaluation of current storage conditions. Material analysis is essential for understanding the material origins and required care. Observations and assessments are made on the effectiveness of current storage methods with a focus on what types of supportive materials are being used and recommendations for replacing unsupportive materials currently in use. The environmental monitoring of the artifacts is considered by assessing whether an artifact disintegrates due to temperature or placement. When damage is found, it is assessed on appearance and nature, such as texture, color, shape, odor, or other physical properties. The Condition survey

report assesses the type of damages, risk factors, damage intensity, and particular location of the damage found. After listing the damage, the damage location of the artifact is drawn in 3D form. These drawings serve as a way to distinguish between the object and the viewer's perspective. The purpose of these assessments is to identify the collection's most vulnerable World War I-era items.

In summary, this project aims to evaluate the condition of the Camp Upton World War artifact collection and help tailor an implementable conservation and preservation plan. To that end, the three main objectives of my project are: systematically documenting the current condition of each textile item through a detailed condition report survey, identifying the primary risk factors that contribute to the textile's damage, and proposing conservation and preventative practices tailored to the collection pieces. My research is guided by the principles of minimal intervention, reversibility, and respect for maintaining the historical integrity of every textile artifact. These guidelines are in accordance with the American Institute for Conservation's Code of Ethics, the Maryland Historical Trust, and the American Museum of Natural History. These professional standards will ensure ethical, consistent, and appropriate treatment for historic textiles, specifically encouraging the cultural preservation of the Camp Upton military uniforms.

The Camp Upton Collection: World War I

Brookhaven National Laboratory contains a collection of artifacts from World War I and World War II. During World War I, Camp Upton served as a training camp for soldiers, taking in and sending 40,000 men to Europe. After the war, the camp was deactivated, then later reactivated during World War II. This project focuses on the surveying of textile artifacts from World War I exclusively, due to their significance to Camp Upton and for gaining perspective on World War I history. Camp Upton's collection of World War I artifacts has provided information about "The

Great War" that is rarely fleshed out in history textbooks. In the initial process of examining uniforms, it was perplexing to see how there was no distinct pin or medals for the allied powers. However, after research on the sinking of the *Lusitania*, and how it was the main reason for U.S. involvement, it became clear as to why there was an absence of allied power pins. The ship was hit by a German U-boat, thinking that the ship was holding enormous amounts of British ammunition. The uniforms in the collection held a patriotic persona through medals and pins, such as "Welcome Home, Soldier" or "Our Country." The patriotic pins symbolize the reason for U.S. involvement, which was largely the death of "129 Americans" (Hoehling and Hoehling 1996). Due to the casualties, it invoked a sense of patriotism throughout the nation to fight with the allied powers. The purpose of the U.S. involvement was not to help the allied powers but ultimately became about protecting Americans from another Lusitania event. Due to the enormous number of lives lost on the *Lusitania*, it motivated the United States government to join and prepare for war overnight. However, enlisting and sending 40,000 soldiers required funding and time, due to the demand for equipment, food, and training. Instilling a sense of patriotism over grief for other Americans created a great incentive for the American public's support of the war efforts. By examining the uniforms and other textiles, one recognizes how rapid and strategic the Americans had to be, as well as the fact that the uniforms need to be preserved. Through condition survey reports, a profound perspective was gained regarding the U.S. involvement in World War I.

Methodology of the Condition Survey

The condition survey report aids in maintaining conservation ethical standards by labeling the artifact's strengths and weaknesses before alterations. As stated in the American Institute of Conservation Code of Ethics, "conservation ethics obligates conservators to create a detailed condition documentation any time that an object is treated" (American Institute for Conservation

2019). The AIC delineates that the reason for these reports is to also serve as "a permanent record to guide decision-making and interpretation" (American Institute for Conservation 2019). As a result, the regulations listed in their Code of Ethics must be followed to avoid disturbing the artifact's integrity. To begin the surveys, the materials used included a camera for artifact photography, as well as an adapted condition textile survey from the Petroleum Museum. The Petroleum Museum recounts the story of petroleum, which is used for refining into fuel oil and gasoline. However, the museum's management seeks exhibit items such as oil-industry patches, or even historic banners. These banners and patches are considered textiles, which leads the museum to report with condition surveys. The Petroleum Museum was chosen due to their detailed and descriptive condition survey report guided towards textile artifacts. In addition, other sources sued was the artifact glossary of the Conservation Center for Art and Historic Artifacts. The artifact glossary included information about different textiles, such as differentiating between cotton, wool, khaki, and other clothing fibers. These references served as guideposts in handling and reviewing the textiles with a documented permanent method.

The condition survey reports were completed on Brookhaven National Laboratory's site, specifically inside of the Chemistry Building where the artifact collection is kept. In the first week of the program, my mentor, Allison McGovern, taught and supervised my cultural resources intern partner and I on how to catalog artifacts into the database. In the upcoming weeks, I learned from the experience and developed this condition survey reports on my own. However, for the first session of the reports, my mentor supervised me to make sure the artifacts were not in any danger of being harmed. After being taught the guidelines for handling the artifacts, I was able to finish the survey reports independently. During the survey, I used the adapted Petroleum Museum's condition textile survey to assess each fiber's condition, including photography and hand-crafted drawings. The first subject topic assessed was the structural integrity, such as fraying, tearing,

cracked foundations, or sagging frame. The second was the surface appearance of the artifacts by checking for fading, stains, and soiling. Thirdly, the area of damage checked was evidence of pests, essentially harm traces left by pests. The factors of pest damage survey were signs of webbing, moth holes or bites, or even pest excrement. The only pest damage observed in the reports was holes or bites from moths, which is treatable. In addition, environmental degradation can involve foxing, meaning reddish-brown spots or stains. These spots are products of fungal growth, moisture, or other factors pertaining to the environment. The most strenuous damage lies within the corrosion of metal threads due to chemical change. There will be recommendations surrounding the material support, such as replacing wooden hangers. The risk of "pollutant damage increases in micro-environments (like sealed cases) because pollutants cannot escape, elevating their concentrations" ("Pollutants and Collections, Conservation Center for Art & Historic Artifacts," 2022). The unfortunate fact surrounding pollutants is their ability to navigate inside sealed spaces easily, such as museum collections like Camp Upton's. Therefore, implementing plastic covers or wooden hangers invites pests and increases the likelihood of artifact damage, which can be avoided through material change. By assessing the structural integrity, surface appearance, pest damage, and pollutants, these profile bases cover the textile artifacts' assessment of condition in an unabridged way.

Catalog Number CU-543

For the first case study, the textile artifact is a campaign hat from circa 1917, catalog number CU-543. CU-543 is a campaign hat once worn by a United States Army general officer; often the first commanding presence to greet American soldiers as they stepped off the bus. The campaign hat is high crown pinched hat with torn and blackened service cords, as well as stains on the hat's edges. The fiber of the Campaign hat is leather and cotton with a manufacturer label, "John B.

Stetson Company," established in Philadelphia, Pennsylvania. For the campaign hat's condition, it is noted for stains, fading, fraying on the rims, and tears in the leather inside the hat. The condition is in good shape, not displaying signs of drastically brittle leather. However, the leather has begun to sag in its structure, leading to a risk factor of deterioration.

Currently, the artifact is stored flat and protected with a cover; as a result, the color of the hat has not faded on the tip, but only inside. Inside the hat, there is a leather lining that surrounds it, but it has shown signs of beginning to become brittle. Since the main issue for this object is the sagging and brittleness forming inside, there is a specific rehabilitation solution: cavity packaging. Cavity packaging is closed-loop packaging, as well as a sustainable reusable method, improving the mechanical properties of the object. These mechanical properties are subsequently protected by ensuring the packaging is not harming the artifact itself. In addition, the cavity packaging helps by maintaining the structure and limit the sagging of the hat.

However, it is important to note that the packaging should not be at any risk of holding plastic, which could lead to an internal pollution source. Since the artifact's fiber is wool and leather, both polymers produced from animal skin, the material is more fragile. However, if the material is remedied with no pollution risk, it can withstand brittleness and sagging of the hat's framework. In conclusion, catalog number CU-543 is in good condition with minimal stains, but the crown has shown signs of deterioration. Deterioration includes sagging within the interior and the leather lining of the crown beginning to crack. The campaign hat is in great condition, but to maintain its condition, the recommendation moving forward is to implement cavity packaging. Cavity packaging is beneficial to the artifact's lifespan by ensuring stability. However, the preservation of the artifact depends on choosing materials with no danger of polluting the hat's material.

Catalog Number CU-557

Catalog number CU-557 is a green winter coat, made out of wool and cotton, marked as a size eight. The coat label list's the manufacturer as Rosenwald & Weil, marking the date of making as March 28, 1918. The winter coat is olive wool with side pockets, and the coat enclosure consists of eight brass painted black buttons with an eagle. The length of the coat is forty-five inches, and the width is 24 inches. It has a distinctive neck strap that has a small metal hook on the collar on one side, connecting to another hook on the other, ensuring that the collar remains closed around the neck for warmth. While conducing the condition survey report, severe insect damage was observed, as well as fraying, and loose threads. The winter coats have eight buttons in total down the front, and these show evidence of a green-blue color, signifying oxidation of the metals. The winter coat is kept hung on a rack in a dark climate-controlled room. The fraying was found in the left sleeve inside, while the loose threads were in the winter coat side pockets. However, the winter coat is suspended on a wooden hanger, which is also an internal pollution source. Not only is the wooden hanger a pollution source, but a plastic cover is used for the winter coat as well. The wood

is a disservice to the collection by acting as pollutant, due to its, “staining materials from the wood” (Canadian Conservation Institute 2021). Wood should not be in close contact with textiles, as it leads to discoloration or distortion got textiles, as seen on this winter coat. The combination of plastic and natural polymers creates a condition of rapid deterioration. These textiles are more likely to breakdown if combined with plastic substances, due to their ability to have toxic substances. Plastics cause damage for textiles because they absorb, “chemical pollutants from the surrounding environment” (Cai et al. 2023). To ensure a longer lifespan of the artifacts, the best solution is to replace the plastic covers with washed, unbleached muslin and support the interior of sleeves with crumpled acid-free tissue as recommended by the Canadian Conservation Institute (2018). With these recommendations, the aim for the winter coat is to reduce its rate of deterioration by limiting contact with pollutants.

Catalog Number: CU-564

Catalog number CU-564 is a service coat with a shoulder sleeve insignia. The service coat was established for enlisted men, as stated by the War Department's General Order No. 81 (1902), which mandated "olive drab service uniforms for winter wear"' and '"a service uniform for summer wear and for the tropics" (*U.S. Army Service Coats of World War I, 1911-1918*, 2013). In particular, the infantry insignia is for the 77th Infantry Division, also known as the "Metropolitan Division" or the "Statue of Liberty Division." The jacket is currently hanging on a clothing rack

inside the Chemistry Building. The manufacturer's labels suggests that the textile artifact was manufactured by S & L Cohen, New York Depot Q.M.C in 1918.

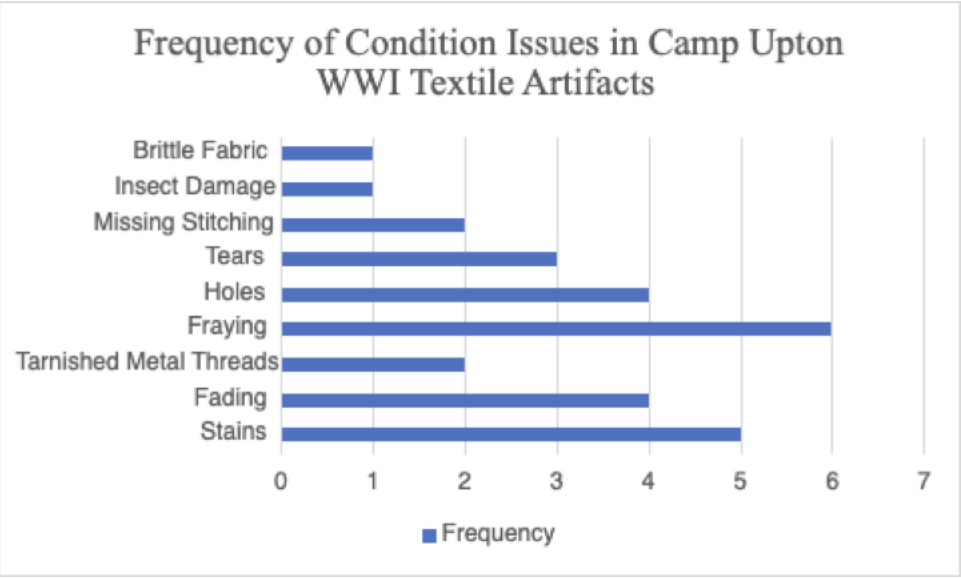
The 77th Infantry Division was the first National Army division assembled during World War I. The infantry stayed directly on the property of Camp Upton until "on March 28, 1918, the division left Camp Upton for France" ("World War I Draftees from New York City Made History in the 77th Division" 2017). The 77th Infantry was able to accomplish its mission by "defeating 11 different enemy divisions; 1,486 soldiers were killed in action, 552 died from other causes, 8,708 were wounded, and 529 went missing by the war's end" ("World War I Draftees from New York City Made History in the 77th Division" 2017).

The jacket, catalog number CU-564, is a green olive jacket with patches of the 77th Division, which is a red circle with a smaller white circle inside. The observed damage during the cataloging of CU-564 included the fading of the 77th patch. Additional damage was observed on the jacket buttons, which were no longer connected to the garment. The left armpit has some tearing, creating two big holes in the artifact. The other damage seen in CU-564 is the fracture of two buttons along down the coat. The two buttons were placed in the left pocket to ensure their location remained known and to prevent loss. Currently, the jacket is hung on a wooden hanger with a plastic cover. As mentioned before, these plastics create poor conditions of artifact sustainability and accelerate deterioration. It is recommended to replace the wooden hanger with a padded hanger, specifically one safer for textiles with no wooden composition. After implementing the hanger alteration, the next step is to change out the plastic cover. The recommended material replacement is acid-free tissue with the muslin covers. These recommended changes for CU-564 will improve the condition of the artifact for a longer period of time.

Results: Key Finding's

The most common types of damage were fraying, stains, fading, and tarnished or oxidized metal threads or fittings. Staining was present in seven out of nine artifacts, representing 77% of the surveyed collection. Fraying was observed in five artifacts (55%), and fading was also present in five artifacts (55%). Tarnished or oxidized metal threads were found in 55% of the surveyed items. Whole on the other hand, holes or tears were found in three artifacts (33%). Furthermore, the leather brittleness was observed in two artifacts (22%), and fungal damage was found in one artifact (11%). Fiber analysis indicated that wool- based textiles were the most fragile, showing the largest range of damage, especially fading, fraying, and pest damage. Canvas-based artifacts

showed more stains and signs of brittleness. Metal fittings and helmet linings showed oxidation and tarnish, suggesting exposure to humidity fluctuations or prior moisture.



Discussion

Since the stains were the single most common issue, they were likely due to prior use or storage in non-archival environments. Logically, close contact with materials like wood or plastic covers might have contributed to the deterioration. The fading, as the most common damage in the wool uniforms and hats, is likely caused by light exposure, which can be inevitable while cataloguing. Fraying was the damage most seen in jackets and hats, due to improper internal

supports, but could be reduced with padded hangers and acid-free tissue. The metal tarnish and oxidation were more difficult to find recommendations for, due to the permanent state of their condition. However, the leather brittleness beginning to form in helmet linings suggested seeking better humidity regulation. The textile fibers were examined to categorize which was most prone to what damage. I found that the wool was most prone to light fading, fraying, and insect damage, while canvas was more resistant to tearing. However, it shared a similar trait with wool in being very easy to stain and becoming stiff over time. As for the metal materials in the artifacts, I found that they were the most vulnerable to tarnish and corrosion but could be protected with humidity regulation. The recommendations for artifact storage would be to regulate the environmental controls, to freeze artifacts to preserve their condition, as well as to remove the materials that do not support these textiles, such as wooden or plastic materials. The implementation of better garment supports, such as padded hangers, tissue-stuffed sleeves, and using flat storage, when possible, is also recommended.

Conclusion

There is an ethical responsibility to make sure that the storage of these artifacts is in the most constructive manner. Therefore, applying these recommendations, we are ensuring the memory, legacy, and sacrifice these soldiers during World War I being honored and respected. In addition, the historical evidence and narrative provided by these collected World War I textiles. The fibers of the material were examined to categorize which was most prone to what damage. The damages result toward wool were mostly due to light fading, fraying, and insect damage, while

canvas material was more resistant to tearing. As for the metal materials in the artifacts, I found that they were the most vulnerable to tarnish and corrosion but could be protected with humidity regulation. The risk factor of stains was the most common issue, especially in hats and wool items, likely due to prior use or by light exposure. Furthermore, the fraying was the damage most often seen in jackets and hats, due to improper internal supports. The recommendations for artifact storage would be to regulate the environmental controls, also considering freezing artifacts to preserve their condition. In addition, as a recommendation, remove the materials that do not support the textiles composition, such as wooden or plastic materials. The implementation of better garment supports, such as padded hangers, tissue-stuffed sleeves, acid-free tissue covers such as Tyvek.

Bibliography

Primary Sources

- Alexander, Robert. *Memories of the World War 1917–1918*. New York: The Macmillan Company, 1931.
- Beamish, Richard J., and Francis A. March. *America's Part in the World War: A History of the Full Greatness of Our Country's Achievements*. Alpha Edition, 2020.
- Guernsey, Alfred H., and Henry Mills Alden. *Harper's Pictorial History of the Civil War*. New York: Gramercy Books, 1996.
- Hart, Albert Bushnell. *Harper's Pictorial Library of the World War*. New York: Harper & Brothers, 1920.

- Horne, Charles Francis. *Source Records of the Great War*. National Alumni, 1923.
- Ours to Hold It High: The History of the 77th Infantry Division in World War II. Nashville, TN: Battery Press, 2002.
- "World War I Draftees from New York City Made History in the 77th Division." *Www.army.mil*, August 29, 2017. https://www.army.mil/article/193021/world_war_i_draftees_from_new_york_city_made_history_in_the_77th_division.

Secondary Sources

- American Institute for Conservation. "Code of Ethics and Guidelines for Practice." *Culturalheritage.org*, 2019. https://www.culturalheritage.org/about-conservation/code-of-ethics.
- "U.S. Army Service Coats of World War I Detailing Enlisted Mens' and Officers' Cotton and Wool Service Coats, 1911-1918." 2013. U.S. Army Service Coats of World War I. December 7, 2013. https://wwiusarmyservicecoats.wordpress.com/276/.
- Cai, Zeming, Minqian Li, Ziying Zhu, Xiaocui Wang, Yuanyin Huang, Tianmu Li, Han Gong, and Muting Yan. "Biological Degradation of Plastics and Microplastics: A Recent Perspective on Associated Mechanisms and Influencing Factors." *Microorganisms* 11, no. 7 (2023): 1661–61. https://doi.org/10.3390/microorganisms11071661.
- Canadian Conservation Institute. "Basic Care – Textiles." *Canada.ca*, 2018. https://www.canada.ca/en/conservation-institute/services/care-objects/textiles-costumes/basic-care-textiles.html.
- "Collections Policy and Procedures." American Museum of Natural History. Accessed August 6, 2025. https://www.amnh.org/content/download/417834/6039663/file/collections-policy-and-procedures.pdf.
- Kigawa, Rika, and Thomas. *Combatting Pests of Cultural Property*. 2009.
- "Pollutants and Collections." *Conservation Center for Art & Historic Artifacts*, July 25, 2022. https://ccaha.org/resources/pollutants-and-collections.
- "Preservation Glossary." *Conservation Center for Art & Historic Artifacts*, 2025. https://ccaha.org/preservationglossary.
- Skeates, Robin, Carol McDavid, and John Carman. *The Oxford Handbook of Public Archaeology*. Oxford: Oxford University Press, 2012.
- "Technical Update No. 1 of the Standards and Guidelines for Archeological Investigations in Maryland Collections and Conservation Standards." Accessed August 6, 2025. https://mht.maryland.gov/Documents/archaeology/2022-Technical-Update-No-1-Archaeological-Collections-and-Conservation-Standards.pdf.