THE SLED, THE LITTER, AND THE PLOT:

FINDING CONNECTIONS BETWEEN MUNDANE MATERIAL CULTURE FROM WORLD WAR II'S USS *NORTH CAROLINA*

By

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USS *North Carolina,* a World War II battleship, which received 12 battle stars during its career, was turned into a memorial and museum in 1961 after it was decommissioned. Since then, the museum has told the story of World War II and life on the "Showboat" through exhibits and displays of World War II artifacts and paraphernalia. Often, museums house a much larger collection than they can display; the *North Carolina* Memorial is no exception. In its collection, the museum houses everything from the fanciest silver to the most innocuous papers. Many of the more ordinary objects can help tell stories of war and life to which the visitors can easily connect.

This thesis focuses on part of *North Carolina*'s story through the voices of the sailors using three "mundane" artifacts. The object biographies of seemingly unrelated objects — in this case the Kingfisher sea sled, a vertical plotting board, and a stretcher

— showcase elements of construction, technological improvement, and inferred value. Additionally, events and people connect these seemingly unrelated artifacts. Ultimately, mundane artifacts can be related to each other and to stories shared to provide a holistic and relatable history.

Key Words: Mundane, use-life, object biographies, oral histories, material culture, USS *North Carolina*, World War II, Pacific Campaign, OS2U Kingfisher, floatplane, sea sled, plotting board, Combat Information Center (CIC), radar, stretcher, litter, John A. Burns, 1942-1945, USS *North Carolina* Battleship Memorial

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CHAPTER 1: INTRODUCTION — A MATERIAL CULTURE STUDY

In the following chapters, the history of USS *North Carolina* (BB-55), a World War II (WWII) battleship that served in the Pacific theater, will be evaluated through the analysis and preservation of pieces of the ship's material culture. Many mundane, or everyday, artifacts are acquired and stored in museum collections but go unnoticed as they are considered unexceptional because they were mass-produced, had utilitarian functions, or were simply overlooked for an artifact with a better story. But even the most average artifact could have been significant in the day-to-day life of its users, producers, or benefactors. Given the opportunity, all artifacts likely have an important history to tell. Examples of mundane World War II artifacts can help fill in the details and create a more well-rounded and authentic World War II story for the public.

Use of material culture concepts, including "use-life" and "object biographies," can help recreate life cycles and connections between seemingly unrelated artifacts. Use-life studies often look at artifacts as passive objects: something to which things happen (Gosden and Marshall 2010). In contrast, object biography studies give artifacts agency. "As people and objects gather time, movement, and change, they are constantly transformed, and these transformations…are tied up with each other" (Gosden and Marshall 2010:5). Artifacts can thus be examined to show the connections and tell the metaphoric biography. This biography has different points of interest, just as books have chapters. These points constitute different segments of an artifact's life. Object biography is used to better understand the artifacts and their influence. By first examining use-life to understand the foundation of the story, objects can move from passive to active through an explanation of their context and biography. This thesis will utilize the concepts of use-life and object biography to examine how artifacts are created, used, and altered by people and to show the objects' agencies and how they influence their surroundings, respectively. It will do so by using three artifacts from *North Carolina*: the Kingfisher sea sled (Figure 1), the vertical plotting board (Figure 2), and a stretcher (Figure 3).

It will answer the research question: how can the study and preservation of mundane objects contribute to our understanding of World War II experiences on board *North Carolina*? The following subsidiary questions will help to answer the larger research question:

- What are the biographies of the sled, stretcher, and plotting board?
- How are these mundane objects and their biographies connected?
- To what stories and experiences about World War II and *North Carolina* do the artifacts communicate with a visitor?
- How can the stories of mundane objects be related to the public in a meaningful way?

FIGURE 1. USS *North Carolina*'s sea sled (Author 2013)

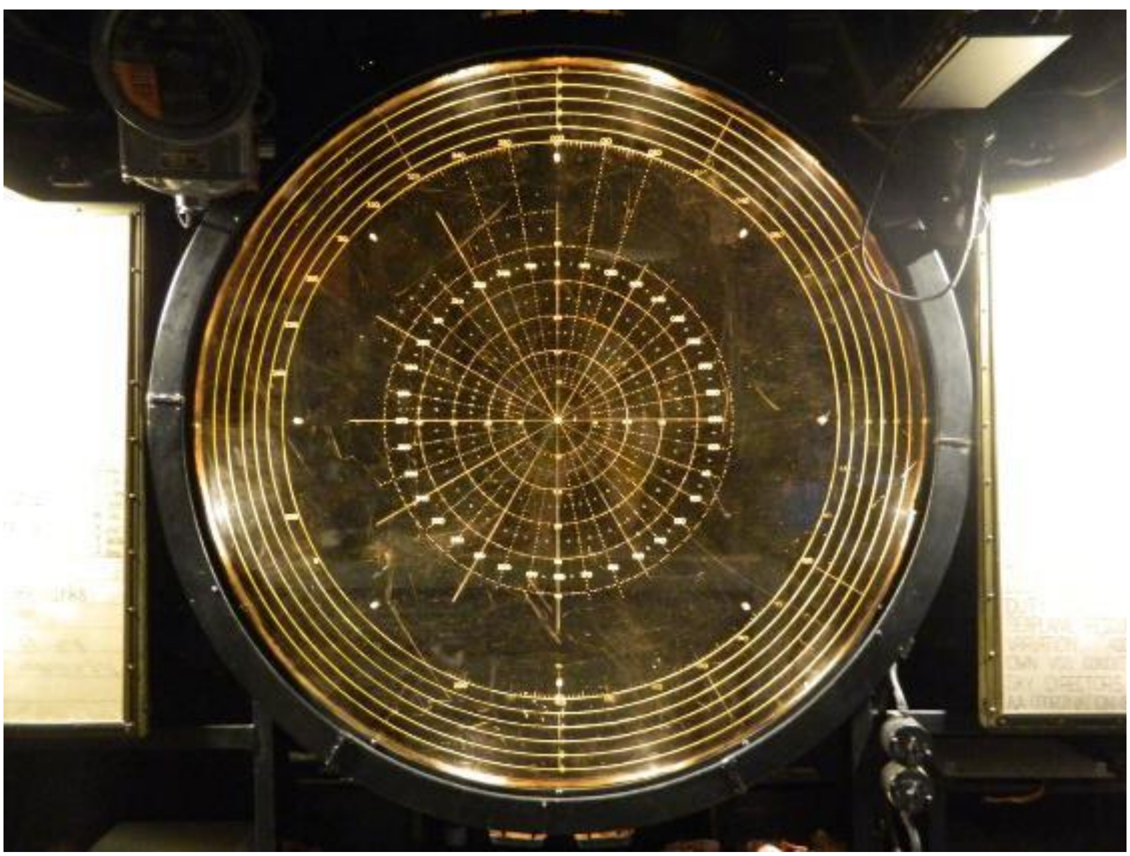

FIGURE 2. USS *North Carolina*'s vertical plotting board in the Combat Information Center (CIC) (Author 2014)


FIGURE 3. One of USS *North Carolina*'s stretchers in storage (Author 2013)

Because historical research, material culture and archaeological theory, and museum studies need to be integrated for this thesis, no one set of literature can cover its entirety. Journal databases and library catalogs were used to search for anthropological, historical, archaeological, and education books and peer-reviewed articles connected with the thesis through pre-defined key words, like material culture, use-life, cultural biographies, USS *North Carolina*, and World War II. Source material was carefully organized into a bibliography and developed into a literature review (Chapter 3). This thesis relies and preferences oral accounts, specifically personal narrations of the sailors and crew of *North Carolina*, in an effort to tell the crews' stories as opposed to a more traditional history of the ship. As such, fewer official government documents are referenced.

Primary sources come from Joyner Library at East Carolina University (ECU), specifically the Rare Manuscripts and Special Collection, and the National Archives in Washington, D.C. Sources include oral histories, vessel correspondence, and field manuals. The Special Collections Department of Joyner Library at ECU houses 64 oral histories transcripts from *North Carolina* crewmembers, which were read for mentions of the artifacts or activities related to the artifacts. Because the collections are not digitized, the author read every document.

Finally, analysis of the use-life and preservation of the artifacts was considered. The author visually inspected the artifacts' conditions and staining to carefully identify the artifacts' original purposes, potential modifications, and to assess the artifacts' conditions today. All this was completed in an effort to connect these artifacts' historical stories, preservation, and display or storage in a meaningful way that can benefit the overall story of the battleship.

Archaeologists, historians, and curators alike must consider how best to convey a relatable history to the public. Artifacts, even the most mundane examples, help elaborate and showcase significance in relation to people, technology, or historical events. The Kingfisher sled, the stretcher, and the plotting board offer an opportunity for research and interpretation of mundane pieces of World War II history seldom seen by the public. These showcase important technological advances, and without them the battleship would not have been such an effective tool during World War II. To preserve these objects' stories, the history and life of a Kingfisher sled, a stretcher, and a vertical plotting board need to be studied using object biography and use-life approaches. Visitors and researchers alike will, thus, gain a better understanding of the battleship's story, the technologies of World War II, and, most importantly, the implications of mundane artifacts on this history.

CHAPTER 2: A HISTORY OF USS *NORTH CAROLINA* (BB-55)

BB-55, USS *North Carolina*, was the first American battleship built after World War I. Its construction started in 1937 following the guidelines of the Second London Naval Treaty. After completion, BB-55 served in the Pacific Campaign during World War II (Doyle 2011:3). It was decommissioned in 1947, but because the ship had such an impressive history and because it was so well-loved during the war, veteran groups, the state of North Carolina, and even school children actively fought to save the ship. It was taken to North Carolina in 1961. Today, it is located in Wilmington as a memorial and museum (Blee 1982:92).

While the largest artifact in the collection is the battleship, BB-55, stories of many ships named *North Carolina* can be found in the memorial. In all, seven naval vessels have carried the title. The first was launched in 1820 and used through the Civil War (Figure 4). Another two ships, named SS *North Carolina,* were captured, converted, and used during the Civil War – one by the Union and one by the Confederacy. The final *North Carolina* in use during the Civil War was the ironclad CSS *North Carolina*, but this ship was destroyed due to teredo worm, or teredo navalis, damage on the green wood used for its hull. The next ship, only technically the second U.S. naval ship bearing the name USS *North Carolina,* was an armored cruiser (ACR-12), authorized on 27 April 1904 (Figure 5). After World War I, plans were drawn for the new battleship USS *North Carolina* (BB- 52), but construction was halted because of the Five Power Treaty, and the ship was never finished (Corbett 1961) (Figure 6). Currently, the U.S. Navy has USS *North Carolina* (SSN-777), a *Virginia*-class attack submarine launched in 2007

(Battleship North Carolina Museum 2016) (Figure 7). The most famous of these vessels, however, is arguably the third USS *North Carolina* (BB-55). A *North Carolina*-class battleship begun prior to, and finished during World War II, this ship carries a total of 12 battle stars from its engagements in the Pacific (Doyle 2011:3).

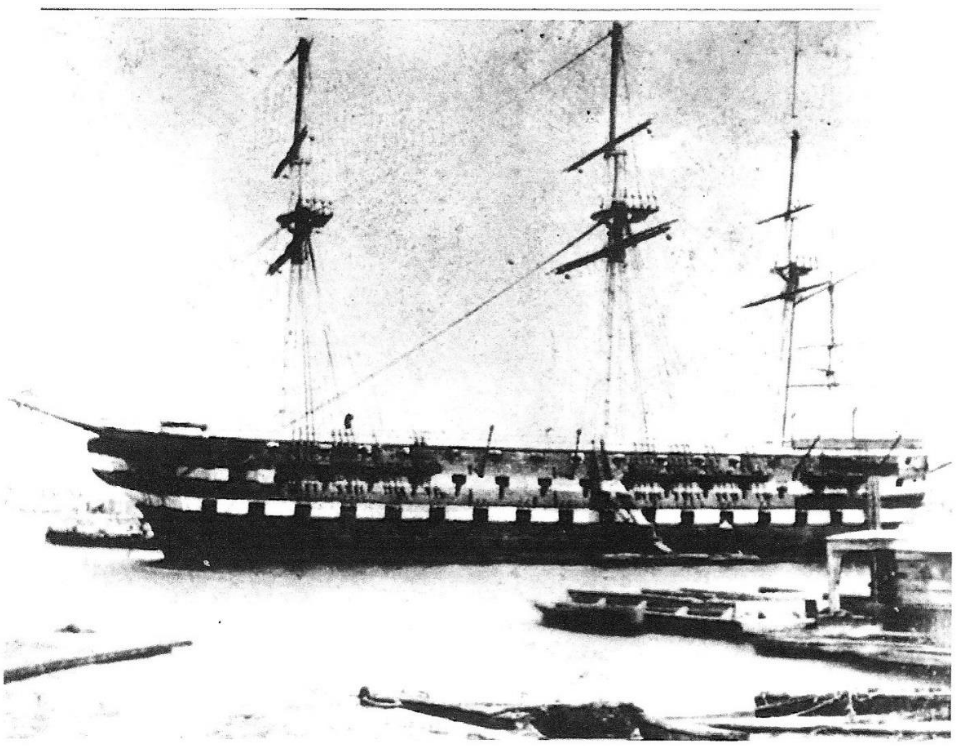

FIGURE 4. USS *North Carolina* commissioned in 1820 (Tommy Trampp, n.d.)

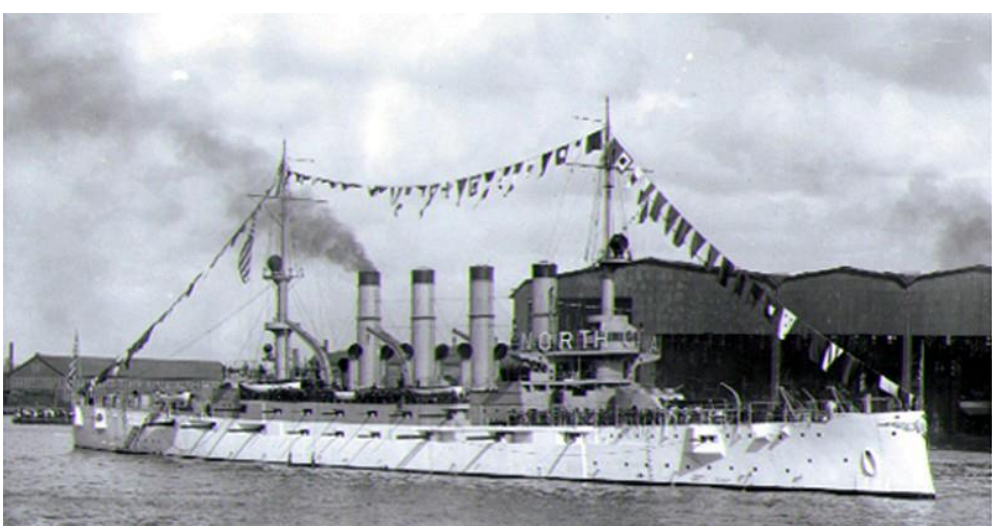

FIGURE 5. USS *North Carolina* (CA-12), commissioned in 1908 (U.S. Navy 1908)

FIGURE 6. USS *North Carolina* (BB-52), under construction (National Archives 1921)

FIGURE 7. USS *North Carolina* (SSN-777) (U.S. Navy 2009)

NORTH CAROLINA (BB-55): A HISTORY FROM THE CREW'S PERSPECTIVE

USS *North Carolina* (BB-55) was the first battleship constructed since World War I (Figure 8). At its completion date, it was the biggest, fastest ship in the U.S. Navy, replacing *North Dakota*-class vessels. The keel was laid on 27 October 1937 in the Brooklyn Navy Yard. The ship was launched on 13 June 1940, and commissioned 9 April 1941 (Shoker 2006:5). BB-55 was more than 728 feet long, had a maximum armor thickness of 18 inches, displaced 35,000 tons, and made 27 knots. When it was in service, there were 108 officers and 1,772 enlisted crew onboard at any given time. Its armament boasted nine 16-inch .45 caliber, twenty 5-inch .38 caliber, sixty 40 millimeter, and thirty-six 20 millimeter guns. The ship also had two plane catapults aft to launch the three OS2U Vought-Sikorsky "Kingfisher" floatplanes (Mobley 1985:4) (Figure 9).

FIGURE 8. USS *North Carolina* (BB-55), commissioned in 1941 (U.S. Navy 1943)

FIGURE 9. Aft deck of BB-55 with port and starboard catapults and Kingfishers (Doyle 2011:43)

From its commission date, this battleship captured the hearts not only of the men who served aboard it, but also of its country. Leo Neumann, who reported to *North Carolina* before its commissioning, recalled the ship's entry into Pearl Harbor (Figure 10).

> They began to cheer. All the people were lined up along the docks, the yardmen stopped working, everybody saw this magnificent ship coming into Pearl Harbor. All the carnage was still there. The ships being still in their sunken positions. Believe it or not, even as late as July, bodies were

still popping out of the water, which was fearful for the people even to work in the water... It was horrible! This is what we saw. This is what we felt and we couldn't believe how everybody began to cheer when we came into that port. It was magnificent. It was tremendous, unexpected, and a thrill. Never forgotten by any of us who were there (Newmann 1975:3).

FIGURE 10. The destruction left after the attack on Pearl Harbor (U.S. Navy 1941)

During its sea trials, *North Carolina* had so much publicity it became known as the "Showboat." At one point, the ship fired all of its guns at once, shaking the whole vessel, supposedly making a flash that temporarily blinded anyone on deck and that sent a shock wave that knocked the glass out of binoculars (Lott and Sumrall 1982:8).

> These were called structural firing test of course. We had fired several rounds one and two gun singles and so forth to operate the turrets and so forth and all I can tell you it was a tremendous blast. It popped several hundred light bulbs; it broke some lenses in the thirty-six inch search lights; we had a couple of boats aboard and it opened the strakes of these boats, pealing [*sic*] them back. Certain rivets and bolts that were over tightened and so forth, from shock, let go. This was what we wanted to learn in structural firing test, what can she take, what in future design do we have to improve on. We had what we called the angled roller bearing in the turrets instead of the old flat like on the old battleships so that the shock was transmitted in a tangent into your barbette instead of a direct broadside, and I can't say that there was any tremendous shift about the ship when she fired these dead to port. When the sixteens, nine sixteens and ten five inch thirty-eights, were all fired at one time. There was a slight roll, there was quite a shock. Structural-wise she certainly did pass the tests (Tucker 1975:4).

Immediately after passing its sea trials, the ship began loading crew. After picking up sailors along the Atlantic Coast, including Norfolk and the Florida Keys, *North Carolina* made its way through the Panama Canal (Neumann 1975:2) (Figure 11). This was a challenge for the battleship. With about six inches to the canal wall on either side, it was not surprising that the ship scraped the canal. Charlie Rosell remembers hearing the scraping from the second gun turret where he was stationed, six decks down (Rosell 1975:3).


FIGURE 11. USS *North Carolina* in the Panama Canal (U.S. Navy 1945)

The ship headed toward Hawaii after its trip through the canal and made a riotous entry into Pearl Harbor:

> A grizzled chief mounted a turret, and led his shipmates in a cheer. The cheering spread from ship to ship, until thousands of voices all around the harbor took it up in a roar that was heard halfway to Honolulu. There in that

great new battleship was evidence that America, the sleeping giant, had at last awakened and was stirring. More of the fleet soared (Blee 1982:44).

North Carolina entered the Pacific theater in July 1942. It was much needed reinforcement for the Pacific fleet, which had not yet recovered from the devastation of the attack on Pearl Harbor in December 1941 that left only one outdated American battleship and three aircraft carriers in the Pacific (Blee 1982:43). 7–9 August 1942, *North Carolina* assisted in landing approximately 19,000 Marines on the shores of Guadalcanal and Tulagi. The relative ease of the initial landings was challenged on 9 August when Japanese cruisers quickly sunk four American ships without significant opposition off Guadalcanal (Blee 1982:44).

Later that month, *North Carolina* participated in the Battle of the Eastern Solomon Islands. BB-55 escorted the aircraft carriers USS *Saratoga* and USS *Enterprise* into battle against the Japanese fleet reinforcements. Japanese aircraft attempted to damage the American fleet, but the aircraft carriers and battleship successfully thwarted the attacks. *North Carolina* is credited with destroying seven enemy aircraft during this battle; additionally, the battleship also assisted in sinking at least seven other aircraft, and the group's pilots sunk one Japanese ship (Blee 1982:46).

Cooperative crew efforts were organized when the ship was attacked throughout the war, no matter the location. The ship was, more than once, attacked by Japanese fighter pilots during its time at sea (Figure 12). While the Japanese planes were occasionally performing reconnaissance, they were also sent to bombard the Americans. One infamous example of this included, by the crew's estimation, 180 enemy planes (Jones 1975:9). Normally some American pilots circled their ships and shot down approaching enemy planes, but “I understand that the morale of the crew members of all the navy ships was getting so low that they let some planes come in and attack us” (Jones 1975:9).

FIGURE 12. Air fight seen from the deck of a World War II battleship (U.S. Navy 1942)

Jerry Gonzales remembers another plane attack, in which a plane barely missed the 20 millimeter mount he was working on. Luckily for him, he was below deck, passing ammunition up to the guns. He only found out about the incident afterward. The Japanese fighter came so close “they could all see his face real good and he looked like he was scared and he looked down and they looked up and they didn’t shoot him” (Gonzales 1975:4). If the craft had been any closer, the crew likely would have shot the plane’s fantail causing the aircraft to crash onto the gun mount, killing the gun crew instantly (Gonzales 1975:4).

It was also not always easy to distinguish American planes from Japanese planes. Japanese planes liked to attack at sunrise or sunset, probably because the lighting covered the markings on their planes. One sunset, Gonzales was working his gun when another crewmember saw an unrecognizable plane. Gonzales brushed it off as an F4, an American fighter, claiming his friend’s worries as ridiculous. Then several other men started shooting at the aircraft and Gonzales realized he had been mistaken; Japanese planes dropped two bombs in that attack that barely missed a nearby aircraft carrier (Gonzales 1975:4).

The men below deck, loading ammunition or working in damage control, for instance, had a far different experience than those who could see the commotion. The former could only hear the guns firing. The five-inch guns were used for longer ranges and “all you heard [were the guns]… go boom, boom, boom, boom, boom” (Gonzales 1975:5). The middle range guns, forty-millimeters, would “cut in boom-boom, boom-boom, beside the boom, boom, boom” (Gonzales 1975:5). Finally the twenty-millimeters would start:

> …trill, trill, trill and then they were right overhead and all of a sudden it [was] quiet. Then about ten of fifteen minutes later all of it [would] start

> again, boom, boom; then you got that boom-boom, boom-boom; trill, trill, trill, all of a sudden it is quiet again. That is the way the battle went (Gonzalez 1975:5).

There was a system to rank the severity of battles: X-ray, Yoke, or Zed. X-ray was the least severe and most men could stay as they were, but in the case of a Zed situation everyone was to report to their battle station (Frost 1975:3). One such Zed situation arose suddenly on 15 September 1942 (Neumann 1975:9). USS *Hornet* and USS *Wasp*, protected by a fleet of cruisers, destroyers, and battleship *North Carolina*, were carrying marines to reinforce Guadalcanal. The force was approximately 250 miles south of the island when *Wasp* was torpedoed three times on the starboard side and sunk by a Japanese submarine. Initially unaware of the cause, or severity, of *Wasp*'s situation, *Hornet* and escort *North Carolina* continued to slowly steam toward Guadalcanal. The warnings came too late for *North Carolina* to avoid the torpedo headed into its port bow. The ship watched the destroyer USS *O'Brien* take a devastating blow and was then hit at 2:52 p.m. (Blee 1982:46–50). After the ship gave a large shake, men started running to their stations. Charles "Jack" Frost stopped someone and asked what had happened. "And he said, 'I think we got hit with a torpedo'" (Frost 1975:2–3).

Some men, like Willie Jones, were in their bunks as the torpedo hit. "[T]his ship itself could not protect itself from submarines" (Jones 1975:2). So, even though *Wasp* was sunk and BB-55's crew watched several other American ships take damaging blows, there was nothing *North Carolina* could do when the radar stopped showing targets (Resen 1975:7). Thus, all hands were relieved of their duty stations. Unfortunately, it was not long until a torpedo found its way to *North Carolina*.

> Well, the first word I heard on it was the destroyer 411 said the torpedo had just passed under it aheading [*sic*] for us. And just a second later a lookout spotted it and said he had seen a torpedo wake coming…So, they had just throwed [*sic*] the rudders hard down, and we were turning to port and when that hit, why, there was a cloud of water that went higher than the main mast of the ship and went on up, a big cloud of water (Greenway 1975:1).

This was a tragedy, but proved the ship's technological successes too. It was a tragedy because five sailors were lost and 23 were wounded, but even with a hole in the side, the ship was able to stay at sea another five days (Sisco 1975:4; Blee 1982:56). It showed the power of *North Carolina* and its crew because of the way it was handled. The damage control team did their jobs quickly and effectively. Enough so that, within three turns from the incident, *North Carolina* was no longer listing. And even with a 32- by 18-foot torpedo-hole in the side of the ship, *North Carolina* was reported to be making 28 knots (Doyle 2011:82, Calder 1975:5) (Figure 13).

Wasp's damage was too severe to save that vessel. It was abandoned at 3:20 p.m. and sunk at 9:00 p.m., killing 193 men and wounding 367 more. *O'Brien* was also lucky to make it out of the fight. The destroyer made it to New Caledonia for temporary repairs. It was headed back to the States for further maintenance when the damage overwhelmed the ship. It sunk 19 October off Samoa (Blee 1982:50–51).

FIGURE 13. Torpedo damage to USS *North Carolina* (U.S. Navy 1942)

After this event, *North Carolina* traveled to Pearl Harbor, arriving 30 September 1942, for repair. It took only 30 days to fix the ship. After additionally installing new anti-aircraft guns, the vessel was sent back into the Pacific theater. The speed of repair allowed *North Carolina* to return to Guadalcanal on 9 December. Battleships continued to protect and escort the force’s aircraft carriers, but after the loss of *Hornet* in October, there was hesitation in risking these ships. This meant that *North Carolina* saw little action in 1943 (Blee 1982:57–59).

The crew continued to drill, but during one such training exercise there was an accident. Target practice was necessary, but no enemy vessels were in the area. Instead the crew was ordered to shoot starshells, or giant flares, at destroyer USS *Kidd*

(Figure 14). All the safety precautions were taken and the shells were set to explode above and aft of the ship (Horton 1975:2–3).

FIGURE 14. Starshells over Iwo Jima (U.S. Navy 1945)

Michael Horton was assigned as first loader on one of the five-inch guns. It was still dark outside and the crewmembers were at their mounts. Horton decided to nap before the exercise; after all, automatic weaponry and starshells could not be too difficult, but he was abruptly woken because he and his gun mate were the only ones at this station (Horton 1975:2). Taking Horton by the collar, his gun mate yelled, “LOAD! LOAD! LOAD!” Word had finally come from the officers to fire. The two of them loaded the powder and the round, and aimed the gun at a forty-five degree angle as instructed. But something went wrong, and the gun jerked back to a horizontal position. The automatic weapon shot the starshell straight at *Kidd*, lighting part of the ship on fire (Horton 1975:2–3). Luckily, no one was hurt in the commotion.

> These two little hands are the ones that loaded it, but I was only a seaman, so it wasn't my responsibility. This was the officers' and the directors' fault, I suppose.… A little parachute was supposed to drop out, and it never got a chance until she hit. Like I say, it was good to be a seaman. You didn't have the responsibility. Even though I loaded it, I was under orders, you see (Horton 1975:3).

Commander Joe Stryker took on the task of pacifying the injured egos of *Kidd*'s crew. The cooks on *North Carolina* spent an entire night baking a cake for *Kidd*. Three days later, when all the smaller ships had to come alongside BB-55 to refuel, *North Carolina's* crew presented the destroyer with 50 gallons of ice cream and a beautiful cake (Blee 1982:61). This eased most of the hostilities. The beer party the battleship crew threw for the destroyer upon their return to Pearl Harbor likely ended all hard feelings (Cope 1975:3).

Though *North Carolina* had a less-than-exciting year in 1943, other U.S. ships were busily securing the Solomon Islands. By November, renewed battleship and cruiser action was necessary across the Central Pacific. This action was led by Admiral Nimitz and was initiated by an offensive against the Gilbert Islands (Blee 1982:62). BB-55 and five other fast battleships escorted aircraft carriers to help cover the attacks. The U.S. group was frequently bombarded by incoming enemy aircraft, and on 8 December, the battleships attacked the Japanese airfield at Nauru (Blee 1982:65). The Gilbert Islands were successfully recovered.

On 20 January 1944, *North Carolina* joined with seven other fast battleships, twelve fast aircraft carriers, six cruisers, and thrity-four destroyers to form Task Force 58. This formidable force was often divided into several groups that traveled separately and carried out a variety of missions (Blee 1982:65). *North Carolina*'s first mission, following this formative endeavor, was bombarding Roi and Namur Islands as part of the invasion of the Marshall Islands. BB-55 fired 360 16-inch rounds and more than 2,000 5-inch rounds over 29 and 30 January, destroying the Japanese airfield and sinking a troop transport. *North Carolina* was able to recover charts from that shipwreck, which were found to be invaluable to future operations (Blee 1982:66).

Majuro Atoll was subsequently taken, without much opposition. This proved to be an essential acquisition for the following month's operations. From February to July 1944, Task Force 58 attacked Japanese posts including those at Guam, Saipan, Tinian, Palau, Yap, Woleai, Truk, northern New Guinea, and the Marianas. *North Carolina* was involved in all major advances except those undertaken in May, when the ship returned to Pearl Harbor for rudder repairs.

Only days after the initial troop landing on Saipan, Task Force 58 anticipated Japanese defensive actions. Therefore, a subdivision, known as Task Group 58.7, was tasked with defending the force. *North Carolina* was part of this "Battle Line…one of the rare occasions on which this [formation] occurred during World War II in the Pacific" (Blee 1982:70). While no defensive measures against the Task Force took place, The Battle of the Philippine Sea on 18 and 19 June 1944 saw the Japanese suffer the loss of three aircraft carriers, 476 aircraft, and 445 aviators; while the Americans only suffered the loss of 140 aircraft, 76 aviators, and slight damage to USS *Indiana* and USS *South Dakota*. This proved a decisive victory for the United States, even though the Task Force was unable to finish the Japanese naval fleet before it retreated (Blee 1982:70–71).

North Carolina returned to the United States from July to September 1944 for overhaul in Puget Sound Navy Yard, Washington, during which the crew was granted 30 days leave. Then BB-55 returned to the Pacific in early November. A new Task Force, numbered 38, was formed. It consisted mainly of the fast carriers and their escorts.

By this time, the Japanese had begun implementing kamikaze attacks regularly, which caused great distress. The crew had to worry about environmental disasters too. On 18 December 1944, a typhoon hit the task force. With winds over 100 knots, 70-foot seas, and visibility as low as a few feet, BB-55 rolled up to 30 degrees in the port and starboard directions. It was more or less unharmed by the storm, with the exception of its three aircraft which were virtually destroyed. The task force lost 800 men and three destroyers that capsized in the storm (Blee, 1882:73–75).

In January 1945, during the landing at Lingayen Gulf in the Philippines, Task Force 38 was fighting in the South China Sea. “Following each of the many forays, or series of strikes, by the fast carriers, all or part of the task force was withdrawn to a less advanced area...the task force was given a period of several days or more for rest, recreation and ship maintenance” (Blee 1982:72). These breaks in action were called “breathers” and the ships’ crews would take the time to relax (Blee 1982:72–73).

But the fighting was not complete, and on 19 February 1945, D-Day, *North Carolina* fired 806 16-inch rounds in support of a 70,000-man Marine landing invasion on Iwo Jima. The bombardment continued for another three days, and BB-55 fired a total of 3,608 rounds at targets on the island. In the days immediately preceding and following the Iwo Jima attack, *North Carolina* assisted in strikes on Tokyo, too. These strikes were performed by an American group, totaling 96 miles of ships in formation, more than 1,000 aircraft, and over 100,000 total crew members (Blee 1982:79–81).

On 19 March 1945, *North Carolina* witnessed the near destruction of the aircraft carrier USS *Franklin* only 50 miles off the Japanese mainland. Two bombs were dropped on the ship which resulted in rapid damage. More than 1,500 men were thrown or jumped overboard. In total, 724 were killed and 256 were wounded (Blee 1982: 82).

North Carolina participated in the bombardment of Okinawa on 24 March, before the invasion began on 1 April. Five days later, the ship was accidently hit by friendly fire attempting to shoot down an incoming kamikaze. This killed three men and wounded 44 others. Still, BB-55 bombarded the areas around Okinawa for 40 days. By the end of this fight, kamikaze's sunk or cause 20 American ships to be scuttled. Twenty-two other vessels were badly enough damaged that they could not be repaired by the end of the war. When *North Carolina* was ordered back to Pearl Harbor for repairs, it took with it an additional 250 men who were either "fatigued" or who had been previously assigned to damaged or sunk vessels (Blee 1982: 82–86).

In July, the repaired BB-55 joined Task Force 38 in an attack at an industrial complex near Tokyo. While the allied forces expected suicidal resistance, none was experienced. Admiral Nimitz and General MacArthur then began planning an invasion of the Japanese mainland. Suicidal resistance was again expected, as was major loss of life on both sides. In early August, Task Force 38 was ordered to cease air operations and to withdraw 300 miles to sea. On 6 and 9 August, atomic bombs were dropped on Hiroshima and Nagasaki, respectively. On 15 August, Task Force 38, including *North Carolina* and the other ships of the Third Fleet, were given word that the Japanese had agreed to surrender. On 2 September 1945, BB-55's crew was informed that the Japanese surrendered in Tokyo Bay onboard USS *Missouri* (Blee 1982:86–88). In total, the ship traveled more than 300,000 miles (Sisco 1974:5).

The crew was relieved. One crewmember who had been with the battleship the whole war said:

> It was like a reprieve — a deliverance. It was a time to be deeply thankful, and we were. Beyond that, I was so drained in every way after those years of war that entering Tokyo Bay didn't really matter much. All I really cared about was thank God, it's over and we can go home" (Blee 1982:88).

In total, only two *North Carolina*-class battleships were built. They were discontinued for the newer, better *South Dakota*-class, commissioned on 20 March 1942, and for aircraft carriers that were proving themselves to be the superior vessels (Wiper 2009:1). The crew on BB-55 was the reason it did not fade into obscurity. They loved their ship. They had a strange, but wonderful, morale that kept them united. By the end of World War II, the Japanese claimed to have sunk *North Carolina* six times; it received 12 battle stars for the crew's efforts; participated in nine shore bombardments; and destroyed at least, and likely more than, 24 enemy airplanes (Blee 1982:90–91).

For all the horrors the men had to face, their morale kept them in high spirits most of the time. The crew bent or broke some rules and had fun with, or at the expense of, their fellow crew members too. The men spent their free time writing letters home, gambling, and watching movies in the galley. They even had some pets — dogs and chickens — the latter of which were sold in Seattle (Farrar 1975:10).

Jerry Gonzales built model ships inside bottles, dropping one that almost caused a fire on deck (Gonzales 1975:3). Michael Horton made and sold sardine sandwiches (Horton 1975:6). Joseph Iacono fished off the ship's side, once catching a sand shark, which he convinced one of his friends to cook for him (Iacono 1975:3). Edward Cope wrote in a diary about his experiences, the people he missed, and his girlfriend back home (she would eventually become his wife) (Cope 1975:4). He also made alcohol when he could find the ingredients. Because his job was servicing fans, including air conditioner fans, he often got everything he needed. "Servicing one of these fans usually took only a very short time. But, when you needed some yeast or cake or cookie or your clothes starched…we could take an awful lot of time if things were not forthcoming" (Cope 1975:3).

First, he made wine out of the juice taken from canned cherries. But when one sailor got a little too sick off the cherry wine, this operation had to stop. The sailor got so sick, in fact, that he had to sleep in the Marines' bay, where they had congregated. They put him in an empty top rack to let him to sleep off his buzz. Instead, he vomited onto everyone below him. The Marines dragged him to sickbay and Cope took the incident as a sign to lay low. Once the incident was forgotten, however, he tried to make "pure grain alchie" which, once perfected, became the new favorite (Cope 1975:2–3).

There were other pranks played too. Cope recalls a strange incident in the bathrooms:

> there always seemed to be a waiting line at most enlisted men's heads. To shorten the wait on more than one occasion, we would set fire to some balled up tissue and let it flow under the men reading books or just taking too long to relieve themselves on the trough type latrines. This caused many a warm if not singed buttocks, but it did afford a seat to the next man if he was fast enough to gain the hastily vacated seat… (Cope 1975:1).

These anecdotal stories are important to understanding life aboard *North Carolina*. The crew considered the living conditions to be exceptional:

> As far as living conditions on board this ship, I believe you couldn't have asked for anything cleaner and better. The crew were in fine shape to do the work. They got along good. I never saw any personal fights between anybody….We had a regular good menu (Wenck 1975:6).

Without pastimes, humor, and even some childish drama, the ship may have been a dull place to live and, consequently, a dull place to work. *North Carolina* became these men's home. They played, worked, loved, lost, and fought hard for their floating city. They had some tough fights and often thought they might die, but a happy crew is a successful crew. And *North Carolina* was undoubtedly successful. From its tour in the South China Sea to bombing Okinawa, this ship helped the war effort tremendously. It also became a symbol for the rest of the Pacific fleet. The "Showboat" was a symbol of the power of the United States military. And because of *North Carolina*'s singularly high morale, it became an extremely beloved ship. After it was decommissioned in 1947, it was moved to Wilmington, North Carolina, in 1962 for public display as a memorial and museum (Lott and Sumrall 1982:30). It was saved in large part because the crew loved it so much that they could not see it sold for scrap. "I am real pleased to have served on the *North Carolina*… I'm a proud man. I don't think it [was a good ship], I know it" (Babcock 1975:4).

Today, *North Carolina* has been lovingly transformed into a floating memorial and museum in the Cape Fear River. While the Navy still holds permanent rights to the ship and can take it back if necessary; the state, with the help of thousands of citizens, raised 330,000 dollars to move the vessel to its new home and to use it as a memorial to show the history of World War II and to keep the legacy of *North Carolina*, and its crew, alive (Blee 1982:92).

CHAPTER 3: OBJECTS AND THEIR HISTORIES

Mundane artifacts have often been overlooked in museum collections for more glamorous, large, or inherently explicatory objects, but material culture studies have expanded the possibilities for interpretation. For example, *North Carolina*'s sailors' bunks, officer's silver service, and 16-inch guns are very attractive exhibits for visiting tourists. These objects show everyday life, the remnant "Old Navy" expectations of officers, and the power of the ship: each a detail of life on the ship. Inevitably, these pieces have a deeper history than shown at face value to the public. They make a point, sometimes without the guest even realizing it. These pieces did affect the sailors who used them. They also affect a visitor's experience on the battleship today. But stories can be shared using mundane artifacts like the sea sled, stretcher, and plotting board, too. This will be accomplished by looking at the object's use-life and biography.

MATERIAL CULTURE STUDIES

Material culture encompasses all artifacts, from the rare and valuable to the mundane and vernacular (Harvey 2009). Traditionally, only the rare or valuable artifacts were kept, and these were placed behind glass to be ogled by museum visitors. Recently, however, there has been a push to focus on what mundane objects can tell us (Deetz 1996). Orchestrated not just by museum personnel, but also by archaeologists, historians, and other social scientists, this has allowed the field to grow past fetishism and become an accepted interdisciplinary study, benefitting researchers in seemingly unrelated fields (Berger 2009).

Reviewing selected readings from material culture studies, a wide number of previously underexplored segments of social science fields can be seen (Knappett 2009; Knappett and Malafouris 1998). Material culture studies have begun to implement archaeological theories to expand the field and make it more culturally and academically relevant. This explains why books on the subject have an emphasis on methods and case studies.

Professionals using material culture have tried to base the field in archaeology's pre-defined parameters and theories (Berger 2009; Deetz 1998; Harvey 2009). This creates a lack of writing on theories specifically behind material culture studies. Though academics have cited other fields that could provide background for material culture — sociology, history, and anthropology, for example — archaeological theory has been the only one readily applied (Knappett 2009). Maybe this is because the fields are both object-oriented and therefore more closely linked, but it appears that material culture studies is a subdiscipline of archaeology that can use ethnographic and historic data to supplement the findings.

Understanding people, life ways, cultural trends, and thought processes are the main objectives of many social sciences. Everything humans do relates back to their culture and their thought processes. Material culture is a manifestation of the human experience, but without realizing the impact it can have on defining the human experience, it is often overlooked. Today, many material culture books focus on trying to find how commonplace, or mundane, objects actively define or affect the world around them (Berger 2009; Knappett 2005; Harvey 2009; Deetz 1996; Lemonnier 2012).

Several books have been written on material culture theory, including: Arthur Asa Berger's (2009) *What Objects Mean: An Introduction to Material Culture*, Carl Knappatt's (2005) *Thinking through Material Culture*, and Karen Harvey's (2009) *History and Material Culture: A Student's Guide to Approaching Alternative Sources*. Additionally, books, like Deetz's (1996) *In Small Things Forgotten*, Pierre Lemonnier's (2012) *Mundane Objects: Materiality and Non Verbal Communication*, and Karen Harvey's (2009) *History and Material Culture*, use case studies to show that history is enhanced when material culture is involved. It is easier and more entertaining to read and understand a history that involves all of the little things people make attachments with rather than to try to comprehend a theoretical framework with no application.

Deetz (1996) shares several of his case studies with the reader, in *In Small Things Forgotten,* to show the importance of material culture. His observations have changed how historians now view black and white servant relations during the 1660s, how Chesapeake homes were built (cheaply), and how the smoking pipe evolved from both white and black traditions. He also emphasizes that material culture studies have an advantage when used with historical archaeology because artifacts can collaborate or contradict the written record and because historic material culture is more likely to have survived (Deetz 1996). The burial environment can preserve artifacts, but the environment is also a major deterioration factor. What Deetz means is that objects with shorter histories, which have likely been shelved or only recently inadvertently buried, are less likely to have deteriorated because they have not been effected by factors like corrosion or erosion for as long as prehistoric artifacts. That means there is a higher likelihood that historic mundane objects have survived. The *North Carolina* examples studied in this paper are historic and intend to expand the history of the battleship through a case study similar to Deetz's examples.

Knappett (2005) touches on the interdisciplinary nature of material culture in his book *Thinking through Material Culture: An Interdisciplinary Perspective.* Knappett admonishes the academic community for allowing archaeology to be the sole department focusing on material culture data in their research. He pushes for different academic disciplines to use these types of data, stating: "It is hoped that this book has contributed to this development by suggesting new paths and intersections…of the relationship of mind and matter" (Knappet 2005:168–169). He provides history and basic definitions in the field's theories and methods and argues that material culture can be used to work from object to behavior, which can be especially useful when there is no written record to follow, when filling in personal details and even when collaborating or discrediting a dramatic primary source (Knappett 2005). While the history of *North Carolina* is known, hopefully the artifacts studied in the following chapters can inform visitors and researchers about the innovation and personal stories associated with the ship's daily functions.

Berger's (2009) book uses physiological and cultural theories to explain material culture, including Freudian psychological, semiotic, sociological, Marxist, anthropological, and archaeological theories. He emphasizes that material culture is a multidisciplinary way of understanding artifacts. The book is split into three sections, covering the theoretical framework, applications of the models, and analysis of these ideas within society. Looking at artifacts as simple as Coca-Cola bottles or milk cartons, the author explains that these artifacts may seem easy to define, but with closer scrutiny, they become complex material evidence of daily life (Berger 2009:145–152, 189–194). For example, if you were able to time travel, how would you explain a Coca-Cola bottle and how it is produced, or what it is used for, to someone from the 16th century? Many mundane artifacts, like the three *North Carolina* examples, could be rather difficult to explain initially, but may showcase technological advance, manufacturing techniques, or day-to-day activities.

History and Material Culture: A Student's Guide to Approaching Alternative Sources (Harvey 2009) seeks to explain what material culture is by studying its different aspects, including landscapes and typologies, in a series of essays. Harvey asks the questions, "How can artifacts be used in history?" and "What can objects offer the historian?" (Harvey 2009:1). These questions address the author's differentiation between two methods of thinking about material culture: one is object-centered and focuses on technological advances, the other is object-driven and focused on the information objects can provide about more complex social relationships (Harvey 2009:2). The *North Carolina* examples can offer connections to technological advance and can, with the help of sailors' stories, inform about the importance of mundane objects to the experience on the battleship.

Material culture studies can also affect the way researchers view memory, production, and how we assign value to artifacts. These are illustrated in works such as Andrew Jones' (2007) *Memory and Material Culture*, which uses different theoretical approaches to explain why memory is associated with specific artifacts. Carl Knappett and Lambros Malafouris' (1998) book *Material Agency: Towards a Non-Anthropocentric Approach* treats objects as active players in their surroundings. Daniel Miller's (1987)

Material Culture and Mass Production discusses the relationship between society, material culture, and industrial production. Each of these studies adapts a different theoretical basis to explain the complex interactions between artifacts and society and help reveal the "biography" of the artifacts and their significance to the world, similar to this thesis's purpose of connecting three *North Carolina* artifacts to the larger ship's and crews' stories.

DEFINING THE "MUNDANE" AND "VERNACULAR"

A *mundane* object is one that has the "capacity to be unnoticed, to quietly mediate, that is *reproduce*, what have become the commonalities of everyday life" (Michael 2003:128). Mike Michael (2003) argues, in "Between the Mundane and the Exotic: Time for a Different Sociotechnical Stuff," that everyday objects, like "the paper clip, the zip/zipper, Catseyes, the ring-pull/pull-top, the Post-It note, Velcro, the ballpoint pen, [and] the child-resistant cap," are technologies that have become mundane (Michael 2003:127). Once, they were new and exciting innovations, but they have become the things people take for granted. His article tries to connect new technologies with the old and explain how their relationship makes a more complete story. It takes complex technologies to reproduce the mundane: "walking boots, may be 'mundane' technological artifacts, but we can expect that in their design, production, distribution and marketing are entailed the most exotic of technologies" (Michael 2003:132). He tries to explain that, while people see walking boots, for example, as everyday objects, someone took the time to understand the anatomy and needs of the foot to make an effective design; different groups created technologies to find, source, and form each piece involved in the production; yet another individual or group managed distribution; someone was hired to market these mundane walking boots with technologies like television, internet, radio, newspaper, window displays; and finally, someone buys, wears, loves, and throws away a single example of this technology for archaeologists to find years later. What has been thought of as simple, instead, can tell us a complex story when it is examined from conception, through production and distribution, and to an individual. The mundane artifacts from *North Carolina* studied in this thesis will also, likely, have innovative aspects, but their uses certainly prove them mundane.

Another important term is *vernacular*. Widely used to describe architecture, this term can also be applied to artifacts. Vernacular has a variety of definitions and connotations, as explored in Kingston Heath's (2003) "Defining the Nature of Vernacular." Heath explains that the word is often used by architects to describe "folk endeavors" (Heath 2003:48), but has come to be "a somewhat condescending way to refer to poorly conceived, personalized, or watered-down versions of high style" (Heath 2003:48). Heath argues that this word takes on a definition and connotation of its own for every person who uses it. He, instead, tries to revise the definition so it can be better understood and used in the academic study of architecture. Heath wants architecture to be seen and studied for its value and inspirations and says that "the growing awareness of vernacular architecture has served to democratize our understanding…and they make us aware that all levels of culture can and should inform us" (Heath 2003:54).

These terms, mundane and vernacular, can be used as synonyms, but are often associated with different fields. According to the *Merriam-Webster Dictionary* (2015), vernacular is associated with biology, linguistics, and architecture, while mundane is associated with the commonplace. While "mundane" has not been used in academic discourse, but rather colloquial conversation, it has come to be a popular term in material culture studies. *Merriam-Webster Dictionary* (2015) defines vernacular as “of or relating to the common style of a particular time, place, or group.” Mundane is defined as “of, relating to, or characteristic of the world” or “characterized by the practical, transitory, and ordinary: commonplace” (*Merriam-Webster* 2015).

Both *mundane* and *vernacular* should represent and define objects that have become common. These are not meant to be derogatory terms, but rather should be used as Heath describes to “make us aware that all levels of culture can and should inform us” (Heath 2003:54). However, cultural institutions often seem to focus on expensive, large, or impressive artifacts, even though archaeological and material culture studies have shown that mundane and vernacular artifacts can still inform human history. In fact, these artifacts create the everyday experience more than their more impressive counterparts.

The commonplace can then be used to understand how people spent their daily lives. Heli Holttinen (2014) suggests, in “How practices inform the materialization of cultural ideals in mundane consumption,” that “in routine situations such as weekday dinners, cultural ideals are negotiated and enacted (or not enacted) many times a day; week in and week out; year in and year out” (Holttinen 2014:574). By looking at consumer behaviors, Holttinen tries to extract culture through their everyday consumption. The idea is that routines and habits can be reconstructed through what people buy regularly (Holttinen 2014). This theory can be extended to objects that are continuously reproduced, or even improved. By looking at commonplace artifacts, like those found on *North Carolina*, an archaeologist should be able to infer why an object was produced, reproduced, altered, and improved. This constitutes an object's "use-life" or "cultural biography."

"CULTURAL BIOGRAPHIES" VS. "USE-LIFE" — OPPOSING VIEWS

Archaeology has long looked at artifacts to say something about human culture, but the focus has only recently focused on telling the artifact's story. Two approaches to doing this include object biography and use-life. These concepts sound interchangeable, but the theories behind them are very different.

Use-life is a processual idea that focuses "on changes to the morphological or functional characteristics of an object" (Gosden and Marshall 1999:169). This means that an object is changed by people over time. This is, no doubt, a true statement, but use-life only tells the passive side of an artifact's story. Never is an artifact actively changing the world or the people around it. Chris Gosden and Yvonne Marshall's (1999) article "The Cultural Biography of Objects" argues that use-life analysis is too shallow because it does "not address the way social interactions involving people and object create meaning" (Gosden and Marshall 1999:169). For example, a flaked lithic is constantly used, reduced, reformed, and re-used. Use-life histories would look at this cycle and never connect its effects on the humans who used it or how and why they changed or reshaped it (Gosden and Marshall 1999).

Cultural biographical approaches, however, attempt to consider and document the way in which objects and people affect each other. "Meaning emerges from social action and the purpose of an artefact biography is to illuminate that process" (Gosden and Marshall 1999:170). By looking at the entire history — from conception, to creation, to use, to modification, to re-use, to reproduction, to loss, to museum collection — an object collects history, meaning, and value from a variety of sources and effects and is affected by and affects a variety of people and other non-human things. All object biographies aim to connect people to the artifacts. Several articles have been written using both use-life and object biography theories in case studies.

Shott (1996) explains the need to measure use-life to better understand site formation processes in “Mortal Pots: On Use Life and Vessel Size in the Formation of Ceramic Assemblages.” He believes that, to understand a prehistoric artifact, archaeologists must understand all the processes it took to arrive at that place. A big part of this process is the time the artifact was in use. He makes positive correlations between ceramic vessel size and a pot’s use-life, no matter the culture of origin. In this way, he is trying to find measurable data that will ultimately explain site formation. His data is limited, he says, because size and use-life are not directly related, but heavily influence one another because of manufacture, material, nature of use, number of pots in a household, and socioeconomic status of the owner (Shott 1996:480). This conclusion shows that it is not easy to estimate use-life from one factor, but factors as simple as vessel size can be the starting point for further study.

Shott and Sillitoe (2001) try to find a formula to estimate use-life in “The Mortality of Things: Correlates of Use Life in Wola Material Culture Using Age-at-Census Data.” By using age-at-census data, the authors were able to find positive statistical correlations between use-life, size, and value in Wola ceramic vessels and arrowheads (Shott and Sillitoe 2001). In “Modeling Use-Life Distributions in Archaeology Using New Guinea Wola Ethnographic Data” (2004), Shott and Sillitoe expand their use-life research to say that these estimates “are vital to archaeological inference” using ethnographic data as an example to understand archaeological use-life of the same ceramic vessels and arrowheads (Shott and Sillitoe 2004:340). Their models are not definitive, and they admit that estimating use-life in archaeological collections will not be easy, but they still urge archaeologists to try. Ultimately, “we do simply need more data” to better understand formation processes and explain why objects show up more or less readily in discard assemblages (Shott and Sillitoe 2004:353).

Barbara L. Voss (2012) discusses the research potential of the curatorial process in at-risk collections, in “Curation as Research: A Case Study in Orphaned and Underreported Archaeological Collections.” She says that, for collections that lack provenance data, “accessioning, cataloging, rehousing, contextualizing, and conserving” can serve as a research tool to understand the pieces, and she urges professionals to see the potential in curation as research to help save at-risk collections (Voss 2012:146). While this article does not explicitly call this “use-life data,” Voss is advocating artifact centric study without, necessarily, mentioning the connection to a human story.

Similarly, Alastair Owens, Nigel Jefferies, Karen Wehner, and Rupert Featherby’s (2010) “Fragments of the Modern City: Material Culture and the Rhythms of Everyday Life in Victorian London” does not explicitly state a use-life theoretical background, but their study focuses on the disposal patterns of everyday Victorian Londoners in hopes of starting a revisionary history that focuses less on the wealthy and more on the average people (Owens et al. 2010:213). The authors admit, though, that it is challenging to weave a convincing narrative with a lack of ethnographic data for the socioeconomic class studied or a large enough scale to accept the findings as statistically significant (Owens et al. 2010:224). As such, their material culture study is more of a preliminary use-life study.

None of these studies in and of themselves directly relate to the conclusions drawn in this thesis, but they all show that use-life is a viable and important part of an object's story. All of these studies hold the potential to tell a complex cultural biography, too, if the material culture can be better connected with the people using it. By first creating a use-life story, this thesis will build cultural biographies of the artifacts studied.

There are a number of case studies in cultural biographies too. “Stories from Exile: Fragments from the Cultural Biography of the Parthenon (or ‘Elgin’) Marbles,” by Yannis Hamilakis (1999), attempts to show “that a cultural biography approach may prove a more interesting and rewarding avenue for the discussion of issues of cultural politics” (Hamilakis 1999:304). Hamilakis (1999) talks about the history surrounding several phases of the Parthenon friezes from their original purpose through their life in the British Museum to show that the purpose and story of the pieces changes and grows with every new perspective. He admits that it is a fragmented cultural biography, as it does not cover the friezes’ entire history, but it is a starting point and accurately portrays the “paradoxes, ambiguities, and ironies surrounding the cultural life of this group of material culture” (Hamilakis 1999:314).

Evi Gorgianni (2011) studies the biographies of 32 terracotta figurines found in Ayia Irini, in “Goddess, Lost Ancestors, and Dolls: A Cultural Biography of the Ayia Irini Terracotta Statues.” Gorgianni says that, much like a traditional biography, studying the biography of these artifacts can exhibit “the qualities with which things are endowed in each context, thereby revealing their trajectories of transformation [and] also expose latent features of the societies that adopted them" (Gorgianni 2011:636). Gorgianni shows that in all three contexts studied, the terracotta statues carry a religious mystery for the viewers. She states: "It matters not whether the new audience fully understands the former meaning(s) of an object, in most cases the new meaning, value, and function bear only a tangential relationship (or none at all) to its perceived values and functions in former societies or contexts…" (Gorgianni 2011:651).

"The Cultural Biography of a Western Australian War Memorial," by John R. Stephens (2013), examines the use of cultural biography to understand the community and ideology surrounding Katanning War Memorial in Western Australia (Stephens 2013). He concludes that the local community has a complicated love/hate relationship with the memorial and that the memorial helps shape interaction, instead of passively standing by while the community takes action against it (Stephens 2013:673). This shows that political objects can affect the emotions and thoughts of community members in ways that were unexpected at conception.

Judith T. Zeitlin's (2009) article, "The Cultural Biography of a Musical Instrument: Little Hulei as Sounding Object, Antique, Prop, and Relic," specifically discusses a musical instrument's biography relating to two of its many historical owners. Zeitlin offers this biography as only part of the instrument's history, but gives great detail to the instrument's relationship with these two owners. She explores this history through historical documentation from each owner, including "literacy, theatrical, visual, and printed display" (Zeitlin 2009:396). This article argues that the instrument's biography halts at its entry into the museum, partially because it is so highly valued that it is not shown to the public, but also because it will, likely, never be played again (Zietlin 2009:436–437).

Hamilakis (1999), Gorgianni (2011), and Stephens (2013) conclude that the modern context is just as important and adds a new layer to the artifact's biography. All three examples show that the perceived purpose of the objects, political or religious, may change, but audiences can still appreciate the general idea of meaning. Zietlin (2009) disagrees, saying that the biography is halted when the artifact enters a museum. For her instrument, this may be a shallow version of reality. The artifact is no longer played and few people get the privilege of seeing it, but it lives on and gains respect and adoration in its current home. While this may not be an exciting portion of the story, the instrument's biography, like all object biographies, will continue until the artifact disappears. These publications show that active explanation even of partial artifact biographies can showcase greater meaning to the public than passively viewing an artifact at face value.

Some articles combine or reinterpret use-life and cultural biographical theories, like Annemarie Money's (2007) article, "Material Culture and the Living Room: The Appropriation and Use of Goods in Everyday Life." This article explores the connection between people and objects in their living rooms and how these connections affect consumption. She looks at these connections by asking questions of 50 subjects about the meaning of things in their living rooms and concludes that people create meaning with their objects and are not "merely passive consumers" (Money 2007:373). This anthropological study shows that people do, in fact, create emotive connections with their material possessions: justifying archaeological studies of material culture as a way of understanding the connection between object and person.

DISPLAYING CONNECTIONS: EDUCATIONAL APPROACHES

While it is essential to the larger history to use these theoretical approaches to understand and weave an artifact's story for museum display, one must ask: how can this be related to and understood by the general public? Current thinking in developmental psychology and education suggest that the way children and non-expert audiences learn science and technology is through hands on manipulation of objects, narrative storytelling, and conversation. By taking the immersive and hands-on experience that the battleship already provides, and sprinkling a few rare artifacts throughout, like the three discussed in this thesis, the museum can tell narrative stories that start conversations among guests and ensure that they leave the museum with a better understanding of the ship, the artifacts, and World War II.

Adding open-ended, conversation-starting questions can encourage discussion and can supplement the use of hands-on exhibits and narrative stories to future comprehension and retention. Questions about "what," "how," and "why," referred to as "*wh*-questions" promote conversation and encourage discussion (Jant, Haden, Uttal, and Babcock 2014:2030). Questions like these can easily be added to informational signage to encourage visitors to really think about an artifacts function.

Additionally, hands-on discovery is thought to be one of the leading way schildren learn about subjects (Jant et al 2014:2029). They are more intrigued when they can touch and manipulate artifacts and therefore show more interest in what they are doing. But "Conversation and Object Manipulation Influence Children's Learning in a

Museum," by Jant, Haden, Uttal, and Babcock (2014), also states that interaction with objects alone does not lead to overall comprehension and retention of knowledge.

In this study, the authors asked 78 parent and child pairs to visit the Southwestern Pueblo and Plaza and the Pawnee Earth Lodge to investigate how children learned. The participants were split into 4 groups: a control group that was given nothing to assist their museum experience; a group that was given cards with *wh*-questions to enhance conversation about six target objects in the museum; a group that was given objects to assist interaction with and interest in the museum; and a group that was given *wh*-question cards and objects to foster understanding of the museum (Jant et al 2014).

The study found that more "elaborative-talk" conversations occurred between the parents and children with *wh*-question cards, whether or not the children had objects. Additionally, the most "joint conversation" happened among pairs that received objects, with or without cards. Next, the pairs went to another museum to test whether or not the connections made, and conversations had, in the first setting would be transferred to a new environment. The group found that having a combination of cards and objects led more parents and children to discuss the connections between the two museums (Jant et al 2014).

About 50% of the participants also conducted a pre-exhibit activity. They showed that this activity before going to the exhibits, in combination with *wh*-questions, led to higher retention of the material over a two week period following the museum visit. This is likely because children had an idea of what to expect going into the museum visits and then were stimulated by questions leading to discussion. In all, the study found that interaction with objects was not the most important aspect for fostering conversation and learning in a museum. Instead, asking questions that lead to discussion of the exhibit most enhances the experience (Jant et al 2014).

> *Wh*-questions focus a child's attention on aspects of an event that help the parent determine what the child does and does not know. Requests for names, descriptions, actions, explanations, and so forth, can help a child construct a coherent representation of an experience in memory... Together asking *wh*-questions and making associations can increase what is learned and how accessible that information is in the future (Jant et al 2014).

The study also suspects that receiving similar objects before going to the exhibits may have influenced the children to believe the exhibit objects were no longer novel, allowing them to talk more freely about the pieces and the experience. "Joint talk in the exhibit serves as a chance to augment understanding gained from manipulating objects" (Jant et al 2014: 2040) This proved that both interaction with objects and conversation lead to a better comprehension (Jant et al 2014).

Finally, by adding narratives throughout the museum that connect artifacts with relatable stories of people, places, or things that non-expert audiences can identify with, it is more likely that the audience will understand, be interested in, and retain knowledge of their experience — especially when talking about science or technology (Dahlstrom 2014:13614-13620). This has been proven in "Using narratives and storytelling to communicate science with non-expert audiences," by Michael F. Dahlstrom (2014), because "narratives are easier to comprehend and audiences find them more engaging than traditional logical-scientific communication" (Dahlstrom 2014:13614). Because narratives offer a familiar format and are more intriguing to the reader, narratives are a better way to share technical information with the public (Dahlstrom 2014:13614–13620). This means more people will read the information given, consider the "*wh-* questions" asked, and interact with the museum's collection to give a well-rounded and memorable experience.

CONCLUSION

The connections made between people and things create a compelling story for modern visitors. By understanding and displaying the complex history of an artifact through *wh-* questions and narrative, viewers are more likely to make a lasting connection with the piece. When similarly woven into the stories of other artifacts in an archaeological or museum collection, visitors gain an understanding of the collection as a whole. Studying the use-life and cultural biography of mundane or vernacular artifacts to build a compelling narrative and exhibition that combines interaction, questions, and stories can be an effective public outreach tool, as this project will show.

CHAPTER 4: THE SEA SLED

In 1938, the Vought Company introduced the OS2U “Kingfisher,” called the “workhorse of the fleet”: a monofloat seaplane for use on battleships and cruisers as an observation plane (USS *North Carolina* Battleship Commission [NCBC] n.d.:1) (Figure 15). A Kingfisher prototype was launched first from land on 1 March 1938 and then as a floatplane on 19 March in Hartford, Connecticut, near the Vought-Sikorsky factory (Darling 2009:3). The XOS2U-1, the first of its kind, was officially turned over to the Navy on 2 April 1938. It had a Pratt & Whitney R-985-4 Wasp engine that could reach 450 horsepower and a two-blade Hamilton Standard propeller, which enabled the craft to reach a top speed of 171 miles per hour and to land on water at a speed of 55 miles per hour. When the plane was fitted for use on water, the main float was mounted along the centerline of the aircraft, with two smaller wing floats, but it could go slightly faster if it had traditional landing gear (Doll and Jackson 1972:3–4) (Figure 16). It had one .30-caliber machine gun fixed to fire straight ahead, another in the rear that could fire in an arc, and the craft could be fitted with two bombs, either 100 or 325 pounds (NCBC n.d.:3).

This aircraft was almost completely constructed of aluminum, with spot-welded joints, making it unique for the time period. Spot-welding allowed the aircraft to be launched from a catapult and land on the water in any kind of weather without damage making it ideal for use on naval vessels (Darling 2009:25). The craft weighed a maximum of 6,000 pounds, was 33 ft. 10 in. long, just over 15 ft. tall, and had a wing span of 35 ft. 11 in. (NCBC n.d.:3).


FIGURE 15. Vought Sikorsky's OS2U Kingfisher (Darling, 2001:10)


FIGURE 16. OS2U Kingfisher schematics showing landing gear configurations (Bell 2010:50)

The Navy granted Vought a contract for 54 aircraft on 20 May 1939 (Darling 2009:4). Of these 54 craft, 49 were fitted with floats to be launched from ships (Darling 2009:5). That meant that each of the Navy's 15 battleships could be supplied with 3 aircraft and a few could be kept in reserve.

The Navy ordered 158 OS2U-2s near the end of 1939. These had slight improvements to their design, including a better engine and a bulletproof 50-gallon fuel tank. They were later retrofitted with some armor for the crew. Most of these OS2U-2s were used for inshore patrol and were launched from land. The rest either replaced the original OS2U-1s on battleships or were added to cruisers (Bell 2010:2). In 1940, the Navy made their final order of 1306 Kingfishers: 300 of these were OS2UN-1s, the rest were OS2U-3 models. These, again, had slightly improved engines and most were not used for ships (Bell 2010:3). Overall, Kingfishers were used with great success in the Pacific theater. The aircraft were mostly used for observation, as well as for reconnaissance, target practice, anti-submarine patrols, and for water rescues of downed pilots (NCBC n.d.:1).

Three Kingfishers were designated for USS *North Carolina,* but had not been placed onboard prior to sea trials (NCBC n.d.:13). "…[T]hey were over at Floyd Bennett, and the original aviation unit had gone ahead and formed over there, until we ran our test and so forth on our catapults" (Tucker 1975:2). The planes were added to the ship about a month after it was commissioned, between 10 and 15 May 1942 (NCBC n.d.:13). And they were flown often:

> On one of USS *North Carolina*'s first assignments, the aircraft flew approximately a hundred and seventy-seven hours a month per plane or five point eight eight hours per day for thirty days… Now there is no way that we could prove this. But neither has it ever been challenged. Because every log of every ship that had an aviation unit would have to be scrutinized to get the exact figures. But to the best of my knowledge, we have never been able to find another ship that was called upon to conduct so many flying hours in any one month. I think this is some sort of record and I think it would stand…(Tucker 1975:5).

"The USS *North Carolina*'s aviation unit consisted of three OS2U Kingfishers, five aviators, and twenty-one enlisted men to maintain these, which sounds like you are overloaded with personnel. This wasn't true" (Tucker 1975:5). Launching a Kingfisher took a crew of mechanics, riggers, a deck crew, a catapult crew, and a communications crew all under the launching officer, as well as the pilot and gunner. Before the craft could be launched, it had to be mounted to the catapult, thoroughly inspected, and then the pilot, the catapult crew, and the communications crew would go through a series of hand-signals to ensure that the craft and the bridge were ready for the launch (Doll and Jackson 1972:3–4).

North Carolina had two 68-foot catapults installed on the stern of the ship (Figure 17). These could fire a Kingfisher from its cradle at approximately 65–70 miles per hour (Figure 18). This was accomplished by setting off "a powder charge similar to that for a 5-inch gun" while the plane's engine was running at its top speed (NCBC n.d.:2).


FIGURE 17. Storage of three OS2U Kingfishers on BB-55 aft deck (U.S. Navy 1942)

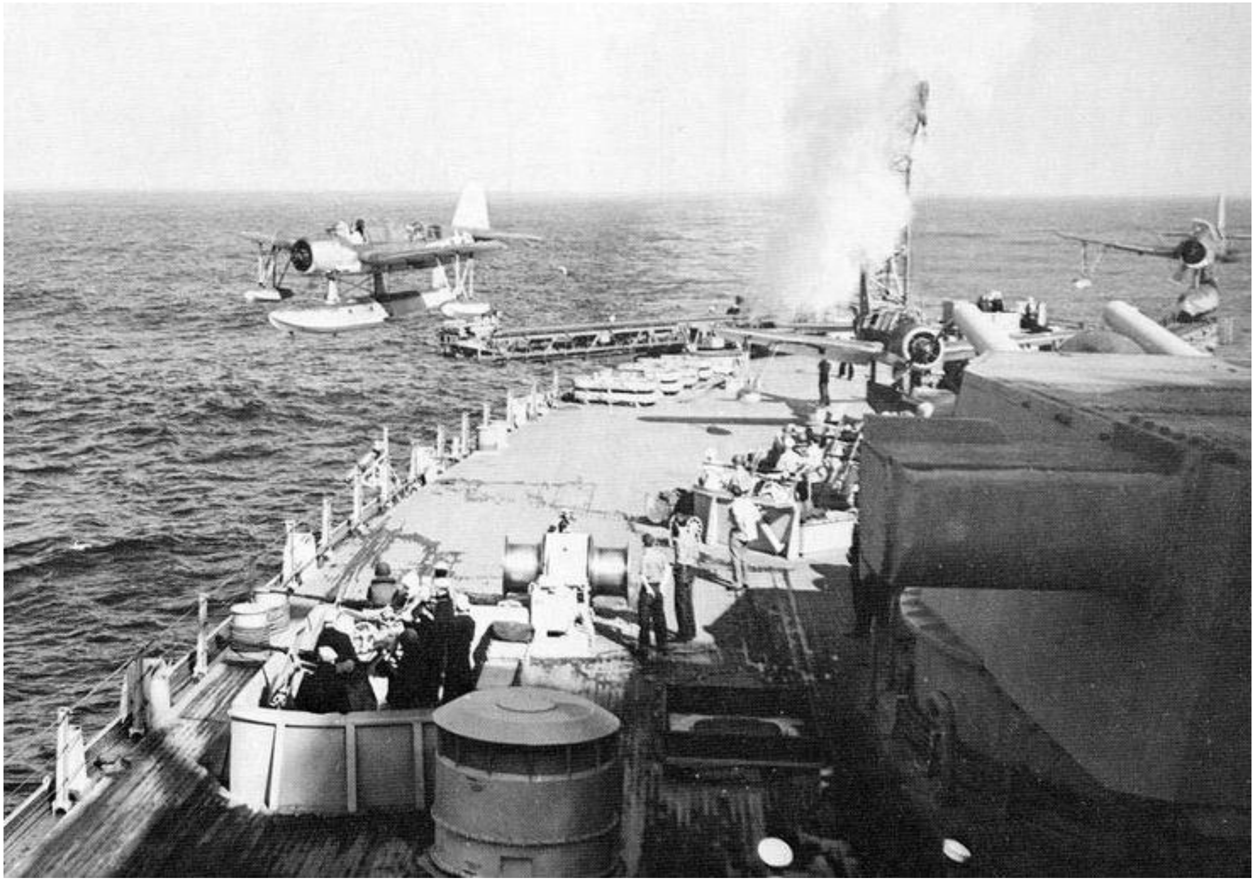
FIGURE 18. Kingfisher being catapulted from the deck of a battleship (Darling 2001:52)

These planes were intended for reconnaissance only, but proved useful in several other capacities, including target practice, “at times the planes would be used for target practice and we’d take them up and fly around and then the ships would simulate firing at us for their gunnery practice” (Sisco 1975:2-3); rescue of downed pilots; and even antisubmarine patrols, as they could be equipped with two bombs (Tucker 1975:5). This made them valuable past their intended use, which was important as the advent and improvement of radar made them less useful for reconnaissance.

> From a practical point of view, I think they [Kingfishers] were damned near worthless. We had one exception, say like going into Utithi; we could get up in the planes. I went up with the aviator and looked out for penacles

> [*sic*] that had nailed the *South Dakota* going into Noumea and helped guide the ship in. But we got in an awful mess that particular time, because Mr. Lowdle, the pilot had signed this paper that all the radios were wired and taped, only to land at the *Iowa* where Admiral Hustvedt was and went aboard and got some fuel and the like, tried our bombs, and they didn't work. We identified the damage to the other ships like the *Indiana* and *Minnesota*, and we also told about the number of battleships, cruisers and destroyers in the harbor. When we got back to the ship, we found that the whole thing was on the air. After trying to keep all of this secret, to have something like this happen would just make you sick. I was sick that we were involved in such a thing as that. I think that the planes were about twenty times as much of a nuisance as they were a value. They were always in the way. They had to be off loaded every time you fired the main batteries, and then picking them up was always a chore. We would spend a lot of time, and also we would expose our ship to the possibility of being torpedoed in the operation of recovering those planes. I believe there again we had a carry-over from the old Navy to this particular Navy, whereas especially when we had our radar spotting ability, we could damned near see where each shell landed. I can't remember an aircraft being at all capable in spotting (Kirkpatrick 1975:19–20).

"Charlie" recovery of the plane, also called "cast pickup," was likely the most difficult part of the operation, especially if there was any sea chop (Doll and Jackson

2010:6). Unfortunately, planes were liable to capsize if faced with any incoming waves (Darling 2009:58) (Figure 19). Fay Wasson, a seaman who joined *North Carolina*'s crew in 1944, was manning one of the forty-millimeter guns on the fantail during one such event (Wasson 1975:1):

> Well, the Kingfisher had just come back from his mission. I don't know what mission it was on, very important though, and the net was out and he flew in and on the net. As the cable was coming down for him to hook it to his aircraft to be lifted up, just before it reached his hand, the ocean just swallowed him… Disappeared, no pilot, aircraft never found (Wasson 1975:3).

FIGURE 19. Kingfisher in trouble during landing (Darling 2001:67)

To recover a plane, a sea sled was connected to the port or starboard crane on the stern. This sled, mainly consisting of a cargo net, was intended to hook the plane's main float and hung over the side of the ship (Figure 20). To even make the recovery possible, several maneuvers were necessary. The ship had to turn at a 45-degree angle to the wind, creating a smooth water surface, or "slick", that the plane could attempt to land on. Then, the plane would land as close to the ship as possible so that the pilot could taxi onto the sea sled. A pawl, attached to the main float, then hooked to the cargo netting on the sled, allowing the pilot the opportunity to turn off the aircraft's engine. This meant that the aircraft was being towed by the ship. The radioman/gunner would then climb out of the aircraft, as a hoisting sling from the crane was lowered, and would attach the sling to the aircraft (Figures 21, 22).

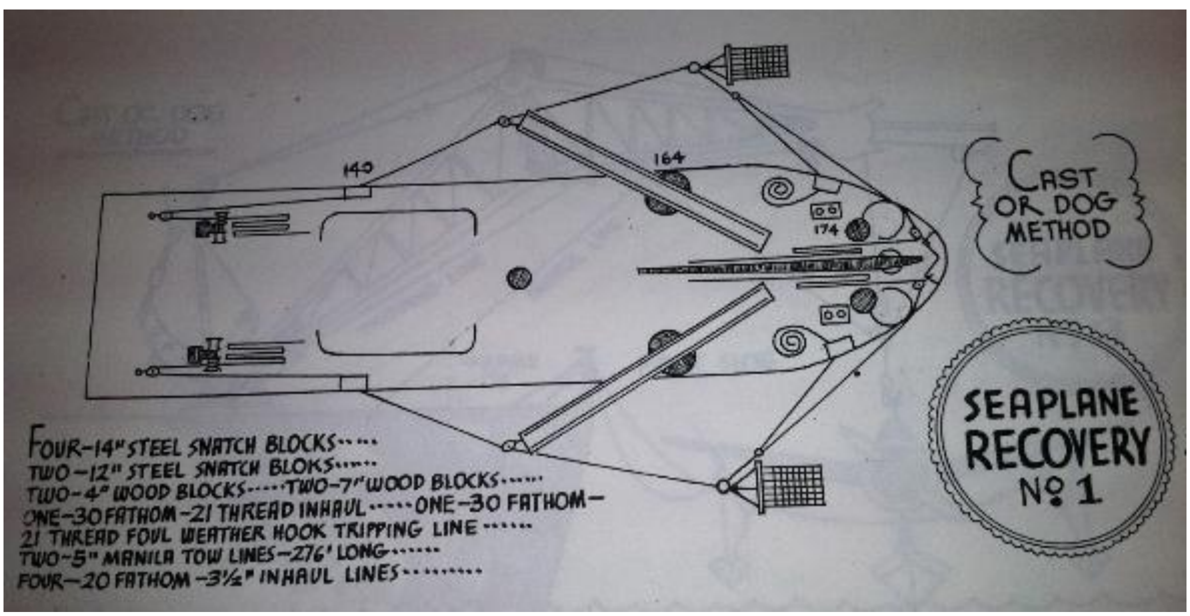

FIGURE 20. Recovery diagram for Kingfisher float plane from the *Illustrated Seaman* (1945)

FIGURE 21. Kingfisher attached to sea sled and being lifted by crane (Darling 2001: 57)

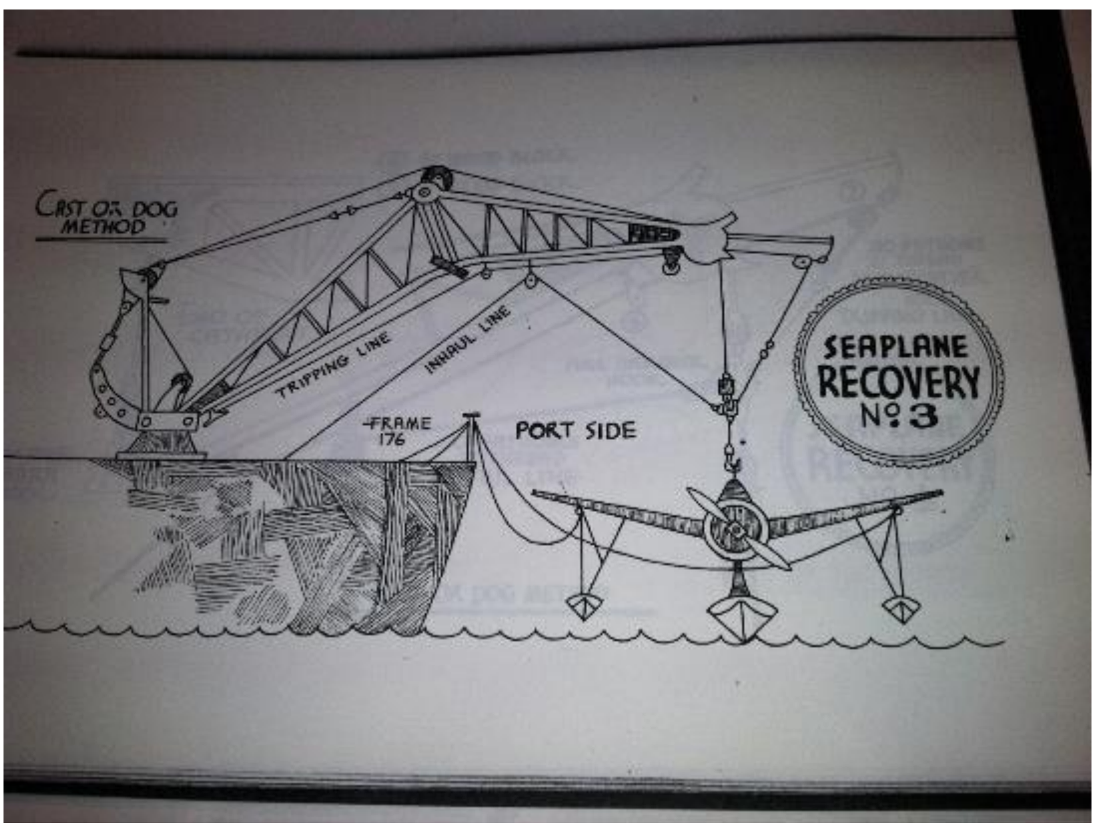

FIGURE 22. The *Illustrated Seaman*'s (1945) diagram to recover a sea plane

Signal flags were used to coordinate the recovery of the plane, which was then lifted from the water. All three Kingfishers could be stored on one crane, but two of them had to be removed from the catapult before the third could be launched (Doll and Jackson 2010:3–5). More likely, the plane would be stored in one of the cradles, one on either catapult and one on the aft deck (NCBC n.d.:4).

While the Kingfisher is a well-documented artifact from *North Carolina* and other World War II ships, the sea sled is much less studied because it was a utilitarian object used as support for the aircraft (Figure 23). Because the Kingfisher and its recovery system were so new to the Navy, several of the crew members saw occasion to mention these pieces in their oral accounts:

FIGURE 23. Kingfisher lifted from sea sled (U.S. Navy 1943)

> I remember on the fantail they had two OSU-2 [*sic*] planes, airplanes. They would land when they would come in from flight operations, they would land in the water and taxi up behind the stern of the ship. We would swing the cranes out, I believe the 6th Division took care of this, and pick them up out of the water and put them on their catapults. We'd fire off theses catapults with some kind of powder charge. They would use the planes for spotting the sixteen-inch guns. They would give back radio reports of where the shells were hitting at, exploding at, how close they were to the target (Goad 1975:8–9).

The *North Carolina* Memorial has a sea sled in their collection and, although it has deteriorated, the artifact can still help tell the larger story of the Kingfisher and *North Carolina*'s operations. When examined, it was housed in a deteriorating canvas sack, coated in a yellow polymer/plastic/paint that was tied around the artifact. The rope netting, which would have acted as the catch for the floatplane's hook, was mostly intact. The buffer, or head piece, which would have hung over the side to connect the plan to the ship's catapults by cable, was rusted and the padding inside it was falling from the seams. The associated cables were wrapped around the yellow canvas sack (Figures 24, 25).

FIGURE 24. Sled's main body (Author 2013)

FIGURE 25. USS *North Carolina*'s sea sled and associated artifacts (Author 2013)

The yellow-painted canvas sack had clear damage from salt crystal formation. The crystals made the sack brittle and had caused several pieces of the sack to detach from the main sack mass (Figure 26). Stress to the sack had also caused rips to develop. Metal grommets were historically used to lace the sack around the sea sled and stress to these areas caused the laces to unravel and the canvas sack to rip from the grommets in several areas (Figure 27). The cables wrapped around the canvas sack and artifact also caused stress and resulted in several areas of deterioration (Figure 28). There is no explained use for this sack in the *Illustrated Seaman* (1945), a manual that tells exactly how to recover the Kingfisher planes, or in crew oral accounts. This could simply be a historic or current method to store the sled in a compact way. The yellow paint on the canvas sack could be a fireproofing agent, which is mentioned in one interview.


FIGURE 26. Stress has caused the canvas sack to tear (Author 2013)


FIGURE 27. The lacing has caused the sack to come apart (Author 2013)


FIGURE 28. The cables pictured were wrapped around the center of the sled causing heavy deterioration to the area (Author 2013)

The sea sled’s rope netting was rolled around the buffer support beam (Figure 29). This likely caused stress to both the netting and the beam, but the netting was still mostly intact even though it was starting to fray and salt crystal formation could clearly be seen in between the fibers. This part of the artifact constitutes an 8x10-foot area with 10x10-inch squares in the netting (Figure 24).

FIGURE 29. The ropes unwrapped from the head support (Author 2013)

The support beam consists of canvas sewn around an iron bar and packed with fibrous masses as a sort of cushion. The ends are capped in leather (Figure 30), but the threads connecting the leather to the canvas, and enclosing the canvas to itself, were deteriorating to the point that packing was falling out of the object and the corroded iron bar was partially exposed (Figure 31). The iron bar was clearly corroded near each end, but it was impossible to see its condition on the interior of the canvas bag and packing. Metal eyes extrude from the canvas sack in three locations so that cables could be attached to the support beam to connect to the ship’s cranes during the piece's use-life

(Figure 32). The iron support beam and eyes were in a semi-stable condition, even though they were corroded.

FIGURE 30. Leather end cap of the head support (Author 2013)


FIGURE 31. Corroded metal rod inside the support beam (Author 2013)


FIGURE 32. Metal eye on the sea sled’s support beam for attachment of a cable to the ship’s crane (Author 2013)

This sea sled is not the same as all of those seen in historic images. Perhaps, the differences, mainly in the support bar design, happened over the course of the war as the recovery device was repaired or improved. Because the Kingfisher was such a new technology, so too was its launch and recovery system. These design variations add knowledge, however small, to the sailor’s stories and the known history of the sea sled and the Kingfisher plane. The sea sled must have had several designs, as seen in photographs of other sea sleds and as shown in the *Illustrated Seaman* (1945) (Figures 20, 24, and 33).


FIGURE 33. Sea sled with a variation to head support (Pacific Aviation Museum: Pearl Harbor 2016)

This could have been an effort to improve the sea sled's stability, in hopes that the planes would not capsize during landing and recovery. It may have been an effort to save materials and time in manufacture as the war continued, using smaller cargo netting and less canvas and paint for the support beam. It could also have been an effort to make recovery less complicated with fewer materials. Or perhaps it was a combination of any or all of these or other possibilities.

We are lucky enough to have oral and traditional histories of the Kingfisher sea sleds, because of its technological novelty at the time. While this artifact became mundane — through its mass production, use, and utilitarian purpose — the idea was novel when it was introduced to *North Carolina.*

The piece's use-life is documented, but a description of the storage conditions for this piece are missing. Whether or not the yellow painted canvas bag was originally designed for the sea sled's storage, or not, it has become part of the artifact — and its history — now. Questions arise, such as: was the bag historically attached to the support beam on the sea sled? Perhaps it was intended to act as a bright yellow marker for the Kingfisher pilots to taxi toward; but no attachment points could be found. There obviously would have been a need to store the sea sled, and rolling the netting around the support beam to place the piece in a container seems a logical move. Additionally, sailors recounted that even their bedding and belonging had to be wrapped in something fireproofed. Chemical analysis of the yellow paint may reveal the fire-retardant properties of the bag. It is also possible that the yellow painted canvas bag became the storage solution for the sea sled after its wartime use-life as part of its museum use-life.

Because storage of the sea sled is not mentioned in the fragmented histories of the artifact, the answer may never be known. The yellow canvas bag's similar deterioration to the sea sled suggests that the two were used congruently. The bag's canvas is splitting apart because of salt crystallization, similar to the rope and canvas of the sea sled.

It is highly unlikely that the USS *North Carolina* Memorial ever put either of these pieces in water, so salt crystal formations are probably from the artifact's World War II life. The similarity of bag and object deterioration then suggests that the bag was storage for, or was at least somehow connected to, the sea sled during its wartime use and that the salt crystals are from the bag being dragged through the water, from the sled being put away wet, or from crystal transfer and expansion over many years.

While the sea sled is a mundane artifact, it was, and has continued to be, well taken care of by the museum. Organics, like textiles and rope, are highly susceptible to water damage, especially from an ocean environment. Given its 74-year life, this mostly organic artifact is in fairly good condition. We know that it was submerged and dried in the heat and humidity of the Pacific many times during World War II, as it was put in the water anytime a Kingfisher needed to be recovered. We also know that the artifact was displayed on *North Carolina*’s deck for at least a brief period during the Memorial’s approximately 50-year life.

Sunlight, and the already present salt crystals, has undoubtedly caused damage to this artifact. While display and storage could theoretically be the sole causes of damage to the painted canvas sack and sea sled, it is highly unlikely that such a utilitarian artifact was thoroughly cleaned of salt crystals during its wartime life, making it likely that the damage seen today is, in fact, at least partially because of its use.

Conversely, having such a utilitarian object survive until the present shows that it has been decently cared for throughout its life. It is clear the museum sees enough cultural, or technological, value in the piece to briefly display it and to continue to store it. It can also be said that the sailors were not actively destroying the piece and that they likely took care of the sled and valued it for its use in the recovery of the monetarily, technologically, and perhaps culturally valuable Kingfishers.

> I want to give our Air Force credit for the work that they did because most of the time the planes had been spotted and they had been shot down by our interception. Our planes themselves were secure from general battle quarters. We had already run up and come down hundreds of times and after a while you get to where you want to see some action, you want to start being a part of the war (Jones 1975:9).

Mundane as it was, the Kingfisher sea sled made the recovery of the aircraft and their crews possible. Without the sled, Kingfisher flights at sea would have been impractical, showing that a seemingly simple technology can be valued for its utilitarian purpose.

CHAPTER 5: THE PLOTTING BOARD

Like the Kingfisher, radar was a newly invented system when USS *North Carolina* was put into commission:

> When we left the shipyard in New York, we had no radar. We had just everything that made a big battleship go that was not often all the way there. At any rate when we actually sailed from New York and went up to Casco Bay and we got radar on the ship, everything just fell into place. From then on, we had no major problems until we got out into the Pacific (Banquet Comments 1975:26).

Radar was first installed on the destroyer USS *Leary* in 1937. Only seven other ships received the technology by 1940. "I guess that the first of the radars that were put on big ships were on the *Washington* and the *North* Carolina" (Ward 1975:3). While some ships were being retrofitted with radar, many only received systems when they were overhauled or during their construction. Development of radar was so rapid that, within a year and a half of its installation, a system could become obsolete (Blee 1982:30).

The technology gave officers on *North Carolina* an improved range of vision, but at first the system was not an effective tool:

> We had a radar — a big bed spring up there. It would show you that there was land somewhere ahead of you perhaps; but you couldn't tell how far;

and you couldn't tell where the limits of it were. We couldn't use that at all (Stryker 1975:6).

"Bedspring," or CXAM radar units, nicknamed because of the shape of its antenna, were not reliable (Blee 1982:28) (Figure 34). In fact, USS *Raven,* a minesweeper, was so worried about *North Carolina's* radar system that the escort lured a German submarine away from the battleship on the way to Casco Bay (Banquet Comments 1975:25).

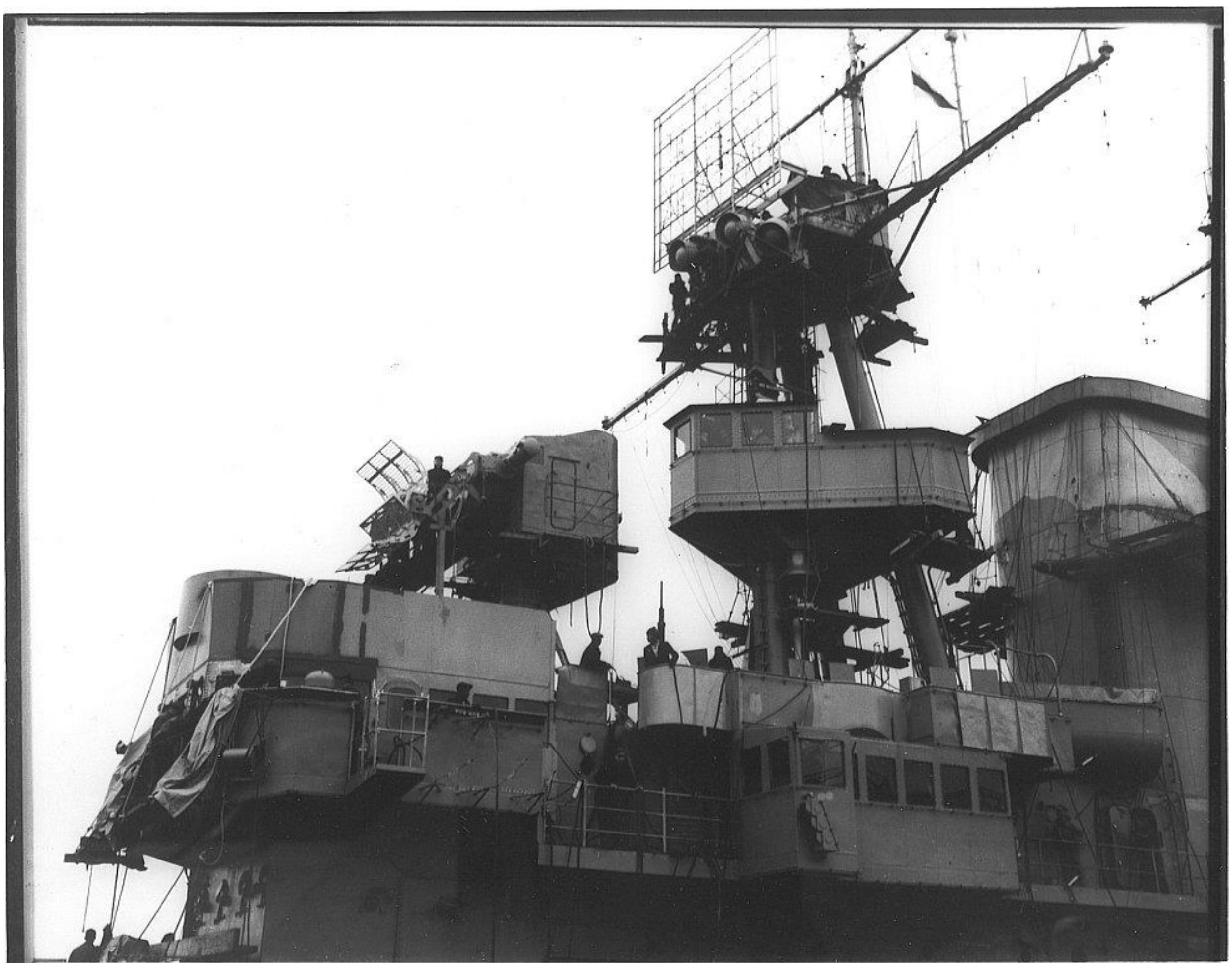

FIGURE 34. CXAM radar antenna on USS *Yorktown* (U.S. Navy 1942)

> I knew that the *North Carolina* had a big radar that wasn't worth a damn, a CXAM. They couldn't pick up a ship to save their life. I thought that ship was going to be charging around there and wouldn't know where I was, so I turned on my lights so he wouldn't hit me. I just wanted to let you know that if you were on board then, people thought that I was ordered to that ship later on because I was such a hero – that I took the submarine away from them (Banquet Comments 1975:26).

Shortly after commissioning, A. G. Ward, a future Admiral who had trained at MIT in the Navy's new radar, fire control, and computing systems, realized that the system on *North Carolina* and its sister ship, *Washington,* was faulty:

> The people in the Bureau of Ships that made these [radar] systems made a mistake; and we didn't know this when we went out, because our radar was not supposed to be turned on except when we were pretty far out because of the fear of someone else getting notice of it. When we got out, ours didn't work very well. Something else that didn't work very well was the gun control system. Something was wrong with it. I went around one day, and Joe Stryker was with me. Joe didn't have quite the technical background that I had, but we went down there and worked together with the fire control technicians and found out that one of the wires in the controlling antenna was crossed. The system wouldn't work. It wasn't any good until somebody did something about it. They had to take one wire off one little screw and put it over here on this little screw. Nobody in the ship knew anything about it, so I stuck my face into it; and I worked a week,

> because it was an enormous maze of wires. Finally I got it so that I figured that it was right. It made it possible the detection of things that were out there. Without this little thing, it wouldn’t work. I sent a message off to Ed Hooper on the *Washington* via that commanding officer on the *North Carolina* and the Bureau of Ordinance that it worked fine. We were going through the Panama Canal when we finally got the thing so it would work all right (Ward 1975:4).

More radar was added to the ship while it was repaired in Pearl Harbor after it was torpedoed in September 1942 (Ward 1975:9). Two new systems were installed to allow *North Carolina* to better detect incoming air attacks. Search radar was controlled through the Combat Information Center (CIC) and was used to detect incoming planes and ships up to 130 miles away. To accomplish this, a SK-2 antenna and two SG systems emitted a broad, high beam 360 degrees around the ship to get a clear, continuous picture of the ship’s surroundings. Additionally, the ship had six fire control radar systems. These had a narrower beam and were only moved to track incoming craft, to aim, and to fire (Blee 1982:29–31). But none of the systems were perfect:

> You just stood at your battle station and hoped everything would work out. We were getting all these reports on radar about all these bogeys coming, and the radar was fairly elementary in those days. What would happen, the strike group from the Japs were coming in, and all of a sudden they would be lost. They would say, “No more bogeys on the screen.” What was happening was that they were in one of these null areas… (Resen 1975:7).

The kinks in this technology did not go unnoticed by the enemy:

> Right, at this particular time it seemed that the Japanese found out that our weak spot in the radar system was coming in low on the surface of the water with their biddy [*sic*] torpedo planes…so in order to be ready for them in this respect we went to general quarters which is when everybody manned their battle stations. We did this before dark each night and before daylight each morning because this was the time they picked to approach us in this direction. We handled them pretty well by doing that… (Jones 1975:3).

To identify incoming friendly planes from enemy craft, the U.S. Navy developed a test known as "IFF," or Identification: Friendly or Foe. This was an electronic transmission to which the enemy planes did not know how to respond (Blee 1982:29). To make detection and identification more difficult, enemy pilots who were able to get close to the Task Force could confuse the radar systems:

> A lot of time we had general quarters, and we stayed in general quarters a lot. What would happen, the Japs were pretty smart. What they would do, they would have a plane fly by the task force, especially when we were in task force 58. They would have a single plane come down through the task force way off, and this is the word I got, of course. I'm pretty sure it is accurate, too. They would drop these streamers of tin foil, and it would run radar crazy. Every streamer would be a potential plane. They would keep us up two or three days like this. You'd be at general quarters because

> there was always bogies on the screen…Once you let your guard down, that's when they really hit you, you see. (Horton 1975:7).

Even when enemy vessels were being closely monitored and tracked, radar did not always prevent attack:

> One of the reasons the *Gwin* was sunk was because in that particular action that night, the Japanese destroyers had shot most of their torpedoes against our task group and had retired over the horizon. We had sent two or three of our destroyers after them. About half or three quarters of an hour later, some ships were returning over the horizon on the same bearing that our destroyers had gone out. Because our radar in the early part of the war was not so sensitive or good we were unable to determine if these were enemy — it was dark, about two or three o'clock in the morning — or whether they were our own ships returning to join the task force…(Wenck 1975:8).

The main way incoming ships, submarines, and airplanes were tracked was through the use of plotting boards throughout the ship. The plot information was provided by improving radar systems as well as by observation planes, fighter pilots, and other ships in the task force (Blee 1982:32). Often pilots were directed to other, potentially enemy, craft to identify the "bogie" as friend or foe. "Successful interception was announced by the code world, 'Tallyho!'. If identified as enemy…the bogies became 'bandits'…A shootdown was announced by the word 'splash'" (Blee 1982:32).

Likely the most crucial plotting location was the Combat Information Center (CIC). Here, crew would look at radar readings, would listen to communications from other stations around the task force and in the air, and would talk with friendly ships to plot enemy craft. Plots would project the enemy's movement and CIC would share these activities with those crew on the bridge, who would decide what the ship was to do next:

> Now you have got to remember that the fighter director's job was not a job necessarily with the guns. His job was working with the aircraft of the carriers and any airborne combat air patrol. And also I was inboard, the Combat Information Center was inboard, so that I was very rarely at a point where I could see anything happening… My role in almost every case was in handling the raids coming in, assigning raids to our men so that we could follow the raids and know exactly where they were, and piping that information up to the Captain over one set of phones that I would have. In the other set of phones I would be in touch with the other fighter directors of the force that we were with — they may be carrier fighter directors or battleship fighter director or cruiser fighter directors — for a complete exchange of information as to where or why (Wenck 1975:10).

CIC worked very closely with the ship's Kingfishers and with fighter pilots in the task force via a short-range tactical radio, called "TBS" (short for "talk between ships") to track observed threats on the water and in the air. They also worked closely with other ships to determine threats and to share information throughout the task force (Blee 1982:32).

> In particular I remember one incident that took place with the bombing of the *Franklin*, which was our biggest and newest carrier, during an air raid. If you recall, she had a tremendous loss of personnel and officers. We were the only ship that had this bogey coming in. All the other ships had nothing but friendlies returning to the carriers. We were in a carrier group at that time. I called the *Franklin* and told them that I had a bogey and I heard no other reports of a bogey and could they confirm that. The fighter director there questioned a lot of the other ships and nobody had a bogey. It was a freak of the radar, because it was a well-known trick of the Japanese. They would slip a plane in somewhere with a returning group, that doesn't mean right in the middle of them where they could be visually seen but close enough so that the returning group appearing on the radar scope showed nothing but IFF, friendly… It was a direct hit, and she caught on fire from one end to the other. She lost hundreds of men. It was absolutely terrible (Sneck 1975:10–11).

Like the Kingfisher and the Kingfisher recovery sled, radar and plotting boards are mentioned fairly often in crew oral histories. This is likely because of the novelty of the technology. Therefore, radar is mentioned specifically, whereas plotting boards are not. This proves how mundane plotting boards were; their supportive role was so simple and utilitarian that they were not even mentioned alongside the more sophisticated radar systems.

The main plotting board used in *North Carolina*'s CIC was a vertically mounted, round acrylic, or Plexiglas, piece, 55-inches in diameter. To this day, it is set in a metal frame, creating a transparent wall that separates the main part of the room from the drawing face of the board. On the back side of the board, one or two men would plot enemy craft. These men would listen to sound-powered head phones and draw backwards symbols, numbers, and letters to denote incoming enemy craft on the board. This allowed other men, namely officers, in the main portion of the room to observe the plots without having the plotters blocking their line of sight (Figure 34).

FIGURE 35. CIC's vertical plotting board (Author 2014)

As radar improved, there was a need to plot enemy craft further and further away. The vertical plot in CIC was only designed to show points up to 80 miles away. This is evident by the stamped rings and numbers designating so many miles. The crew, however, modified the board by adding hand drawn bands to the outer limits of the space allowing craft to be tracked up to 180 miles away (Figure 35). This is a clear representation of the rapid improvement of radar technology at the time. It was impractical and/or inconvenient to replace the vertical plotting board as quickly as radar improved, so the men modified the board by designating further distances.

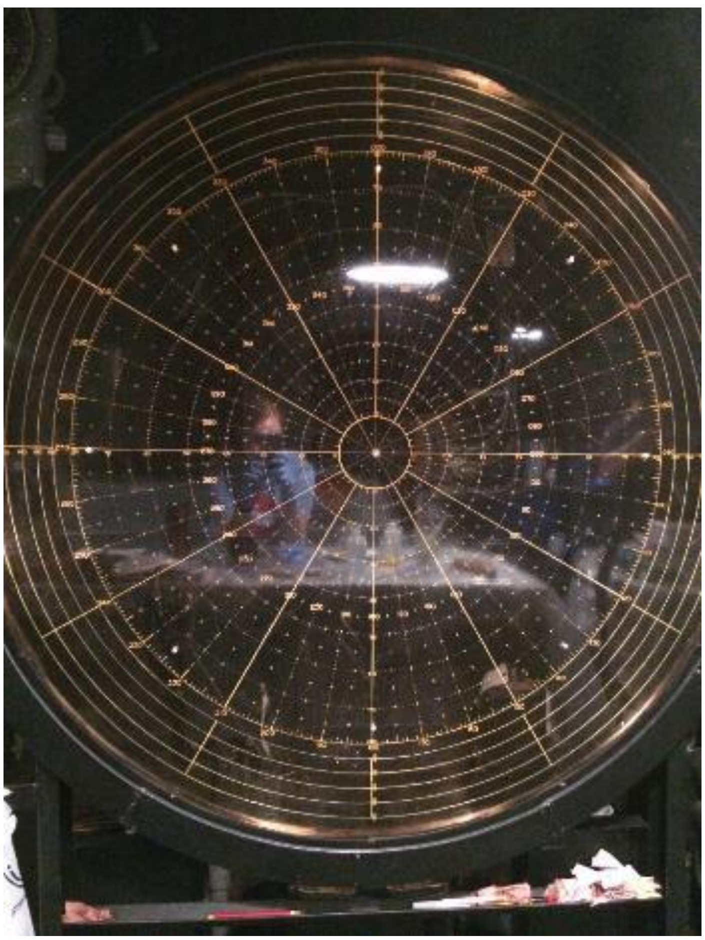

FIGURE 36. Differentiation of interior section, which plots up to 80 miles, and exterior section, which plots up to 180 miles (Author 2014)

When examined, the board had been continuously used over the years as was evident by the fading paint on the surface. Even today, the board is used for demonstrative purposes. This continual use eroded much of the stamped and painted distance and location markings. As part of this thesis, the board was restored as close to its original condition as possible and a Plexiglas cover was added to the board’s façade so that the restored surface will not be worn away again (Figure 37). This way, the board can continue its life as a historical, interpretive artifact. Now, interpreters draw on the Plexiglas cover, instead of on the original surface, protecting the surface, but still allowing visitors to experience the artifact’s use.

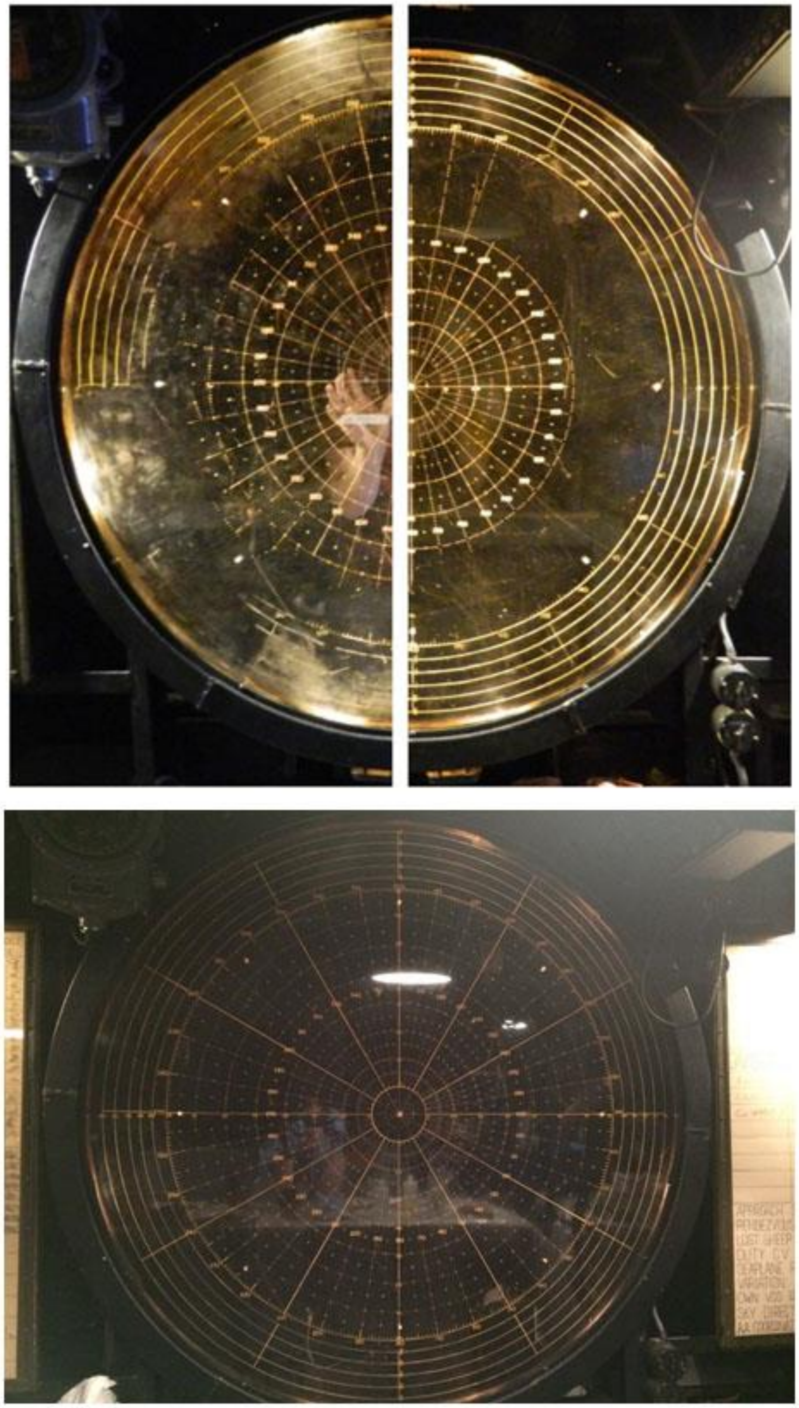

FIGURE 37. The plotting board before and after cleaning *(above)* and after restoration *(below)* (Author 2014)

CHAPTER 6: THE LITTER

Unlike the sea sled and the plotting board, stretchers are rarely talked about in *North Carolina*’s oral histories, even though related artifacts and spaces are discussed. Stretchers, also called litters, are related to the sickbay, which is only talked about anecdotally in the sailor accounts. Edward Cope, for example, talks of waking the duty doctor in the middle of the night because a drunk marine sleeping on the top bunk vomited on the bunkers below him (Cope 1975:3). Jerry Gonzales remembers being sent to sickbay because:

> I fell with a big old bag of laundry... I had a big swelled up bruise on my left leg. I went up there and they drug me to sickbay. Someone said "this man just fell off a ladder." I don’t want to use no profane language but they said, "you get that SOB out of here. This is a field day and we got captain’s inspection tomorrow. Bring him back Monday…" Now we laugh about little things like that. After all, I lived, so I don’t think it was too bad (Gonzales 1975:6–7).

The anecdotes may be more prevalent because talking about injury and death is difficult, and bringing levity to those memories helps people cope. When death is mentioned in the *North Carolina* accounts, it is almost always done briefly and without much detail, like the explanation below.

> He was in that washroom and he was killed. The other four men were in a compartment and when they took their bodies out all their hair was burned off. One man on topside was blown overboard. Never found. That was

> only a small horror of war. There are plenty of horrible stories that go on (Newmann 1975:10).

Getting to sickbay was not an easy journey either, especially when carrying an injured sailor:

> Fox and George L. Saffron carefully laid the trailing parts of the boy's anatomy on his stomach and picked him up. One grabbed him under is shoulders, while the other slipped between his legs and lifted then into his arms. They carried him gingerly and started down the many levels toward sick bay. Scaling the first few levels of the superstructure was difficult, maneuvering the critically injured boy through the crowd of panicked and stricken sailors and down several flights of stairs, his feet bumping against the metal handrail on each side regardless of how careful his rescuers were. But as they entered the main deck hatch to go below, the stairways narrowed and steepened… (Ramsey 2003:284).

To assist in carriage of an injured man, stretchers were built to specification for their intended location. The War Department (1945) described military stretchers in use at the time in field manual *FM 8-35: Transportation of the Sick and Wounded*. The 1945 publication classifies a litter as "a device capable of being carried by two or more bearers for the purpose of transporting sick, injured, or dead persons" (War Department 1945:34).

There were eight types of military litters in use at this time: straight aluminum litter (Figure 38); folding aluminum litter (Figure 39); straight wood litter (Figure 40);

folding wood litter (Figure 41); straight steel litter (Figure 42); metal airplane litter, also called a Stokes litter (Figure 43); ambulance cot litter, or Bomgardner type (Figure 44); and semirigid canvas litter (Figure 45) (War Department 1945:36–51). “These types have been adopted because of availability of certain materials to the manufacturers, and the necessity of designing special litters to meet special situations” (War Department 1945:35). This statement ambiguously encompasses and legitimizes any variations of the eight stretcher. The semirigid canvas litter and the Stokes litter were the two most commonly used in the Navy (War Department 1945:47–51).

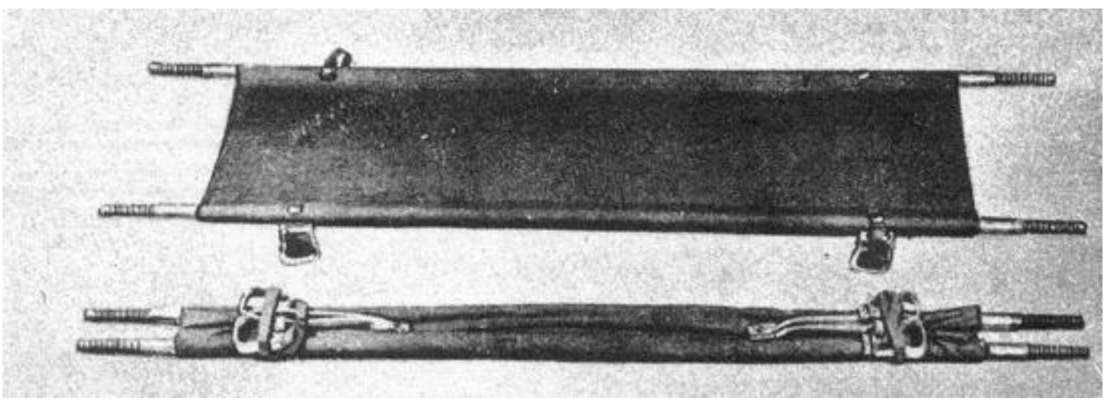
FIGURE 38. Aluminium litter (WW2 US Medical Research Centre 2017)

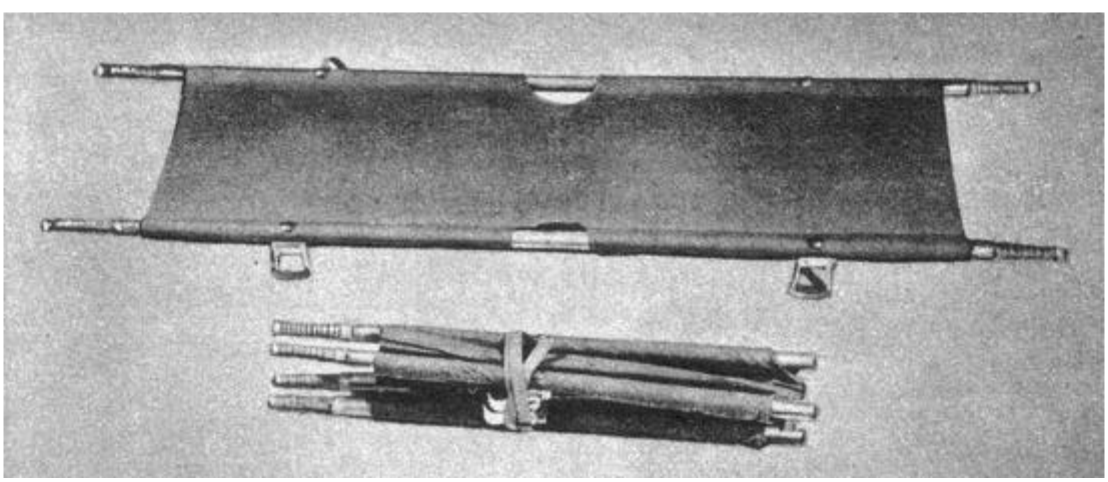
FIGURE 39. Folding aluminium litter (WW2 US Medical Research Centre 2017)

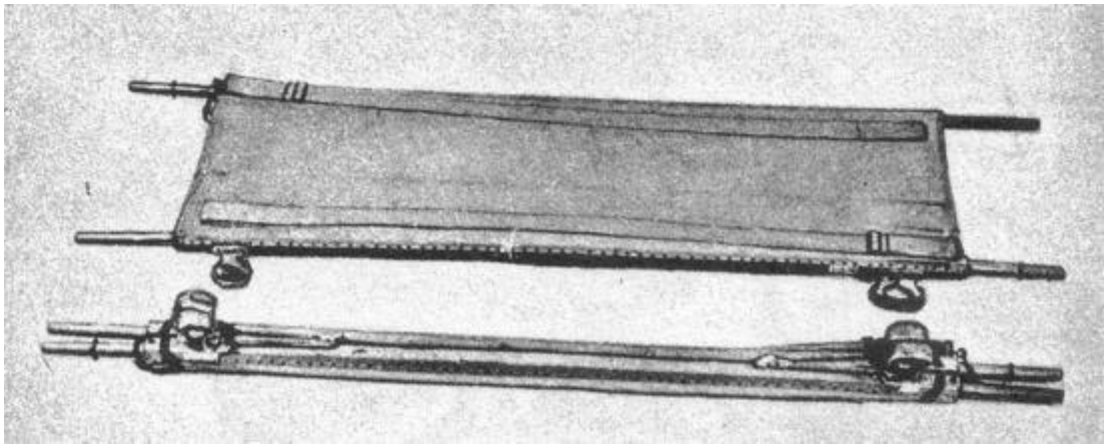
FIGURE 40. Wooden litter (WW2 US Medical Research Centre 2017)

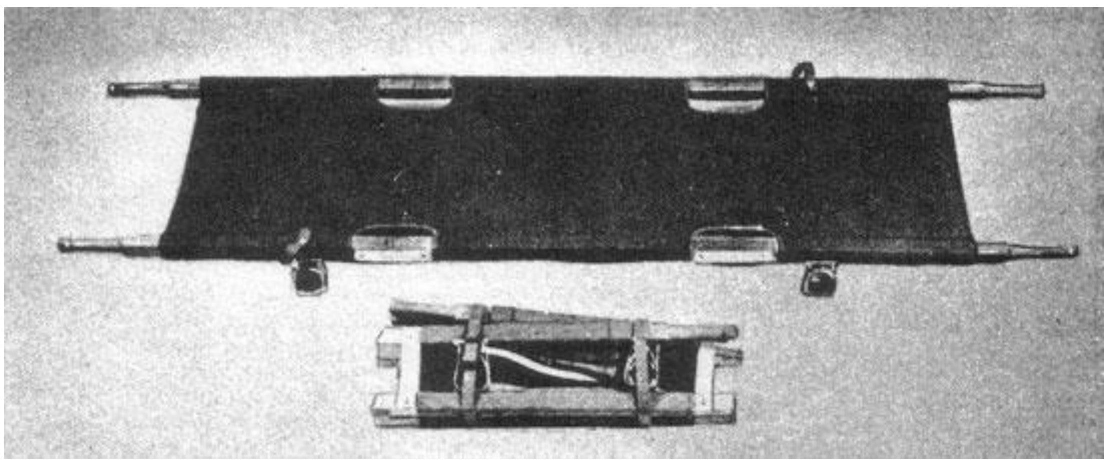
FIGURE 41. Folding wooden litter (WW2 US Medical Research Centre 2017)

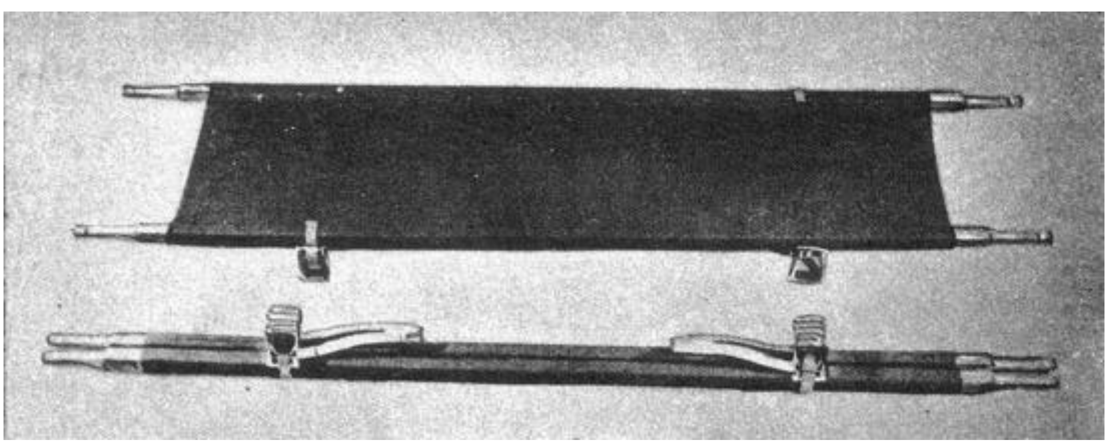
FIGURE 42. Steel litter (WW2 US Medical Research Centre 2017)

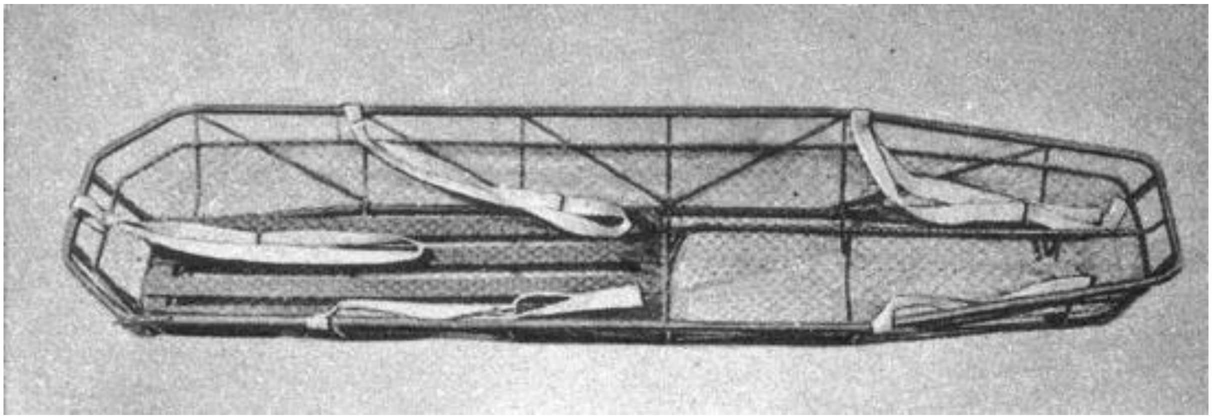

FIGURE 43. Stokes litter (WW2 US Medical Research Centre 2017)

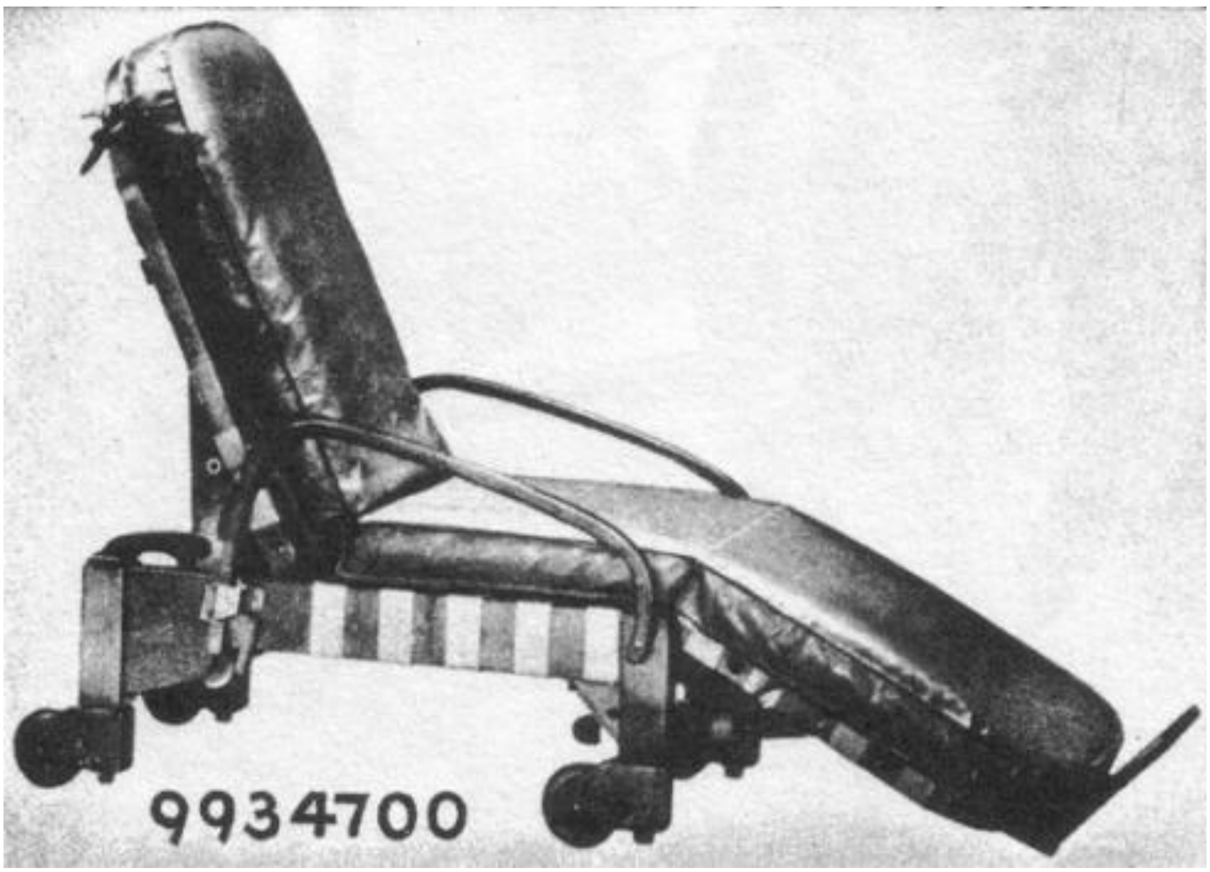

FIGURE 44. Ambulance cot litter (WW2 US Medical Research Centre 2017)

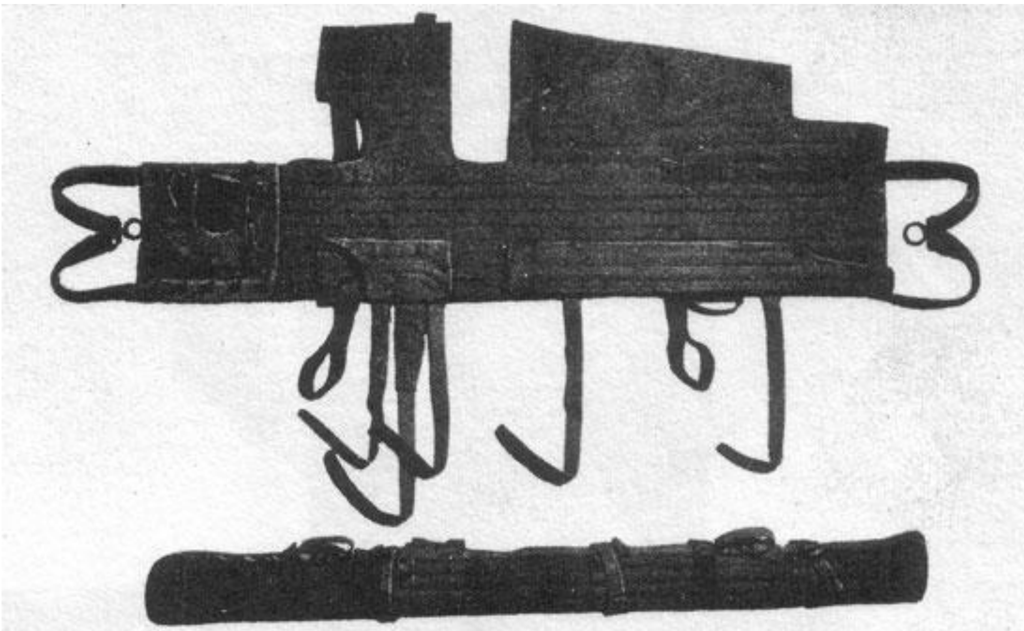
FIGURE 45. Semirigid canvas litter (WW2 US Medical Research Centre 2017)

The *North Carolina* example studied is a canvas construction with wooden supports. Additionally, ten canvas straps are sewn to the stretcher to wrap around the patient's body and were secured with metal clips on the opposite side of the litter. Indiscriminate pencil markings are still visible in several areas and the piece is stained with years of dust and grime as well as potential bodily fluids and tar (Figure 46).

The litter has a triangular head piece with a ring at the top, potentially to facilitate carriage, and a strap that secured the patient's head to the litter. The section that supports the patient's core has a squared flap on either side of the main mass that could be folded over the patient and two straps that could be secured to metal clips around the flaps to ensure that, regardless of swinging, or flipping, the patient would not fall out of the litter.

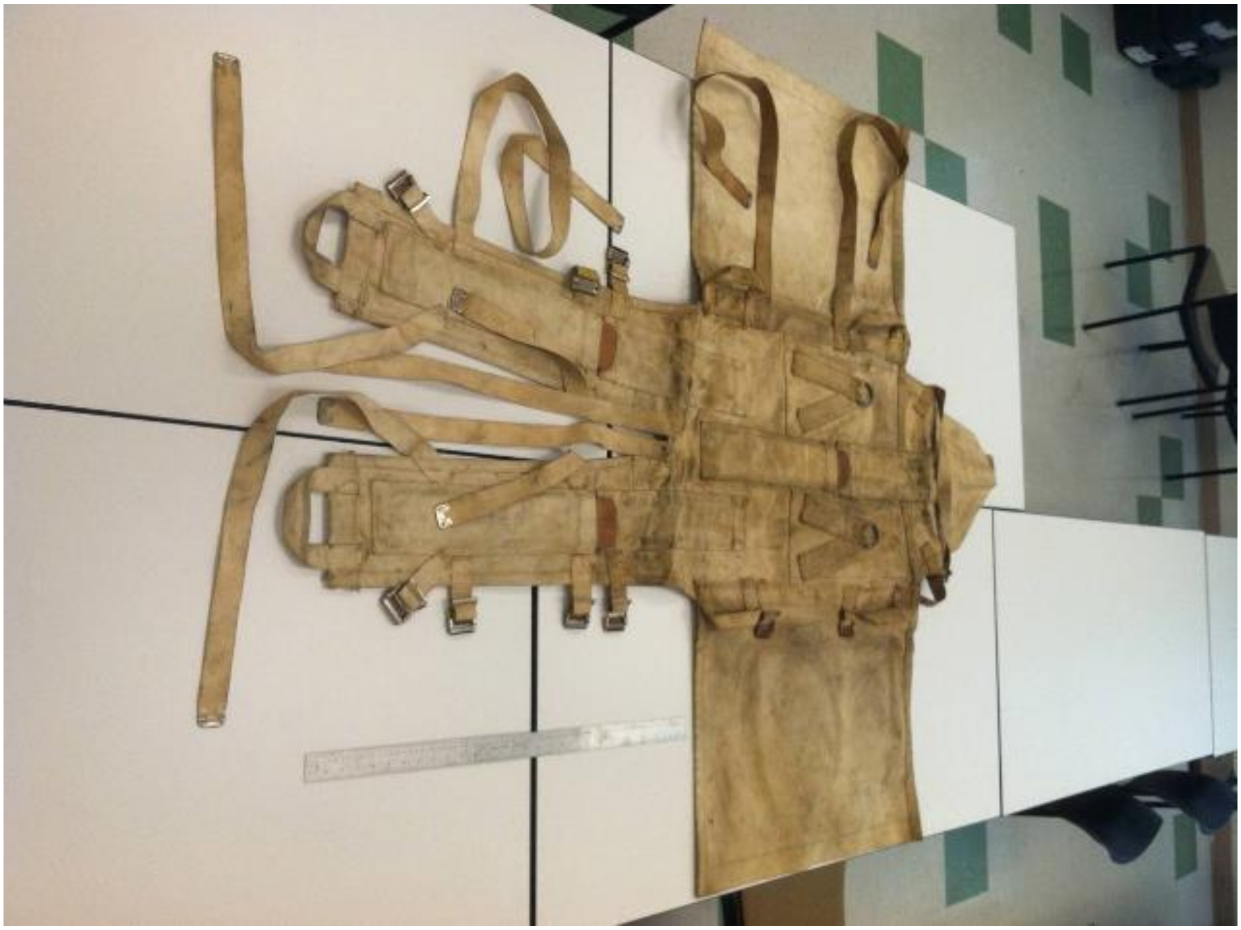
FIGURE 46. USS *North Carolina*'s stretcher showing the securing straps, wooden wedges and pockets, and hand holds (Author 2013)

Additionally, the litter has separate supports for each of the patient's legs. These, too, each have three straps that secured the legs to the stretcher, while a seventh strap is located on the left leg that apparently secured the two legs together. There are also six hand holds, two at the shoulders, two at the hips, and one on the end of each leg support (Figure 47). These were likely to facilitate four- or six-man carriage of the stretcher (War Department 1945:51). On the litter's reverse, there is a ring attached to the right and left of the core section (Figure 48). These could have been to attach the folded litter to a pack or to attach the litter to a Stokes basket, perhaps.

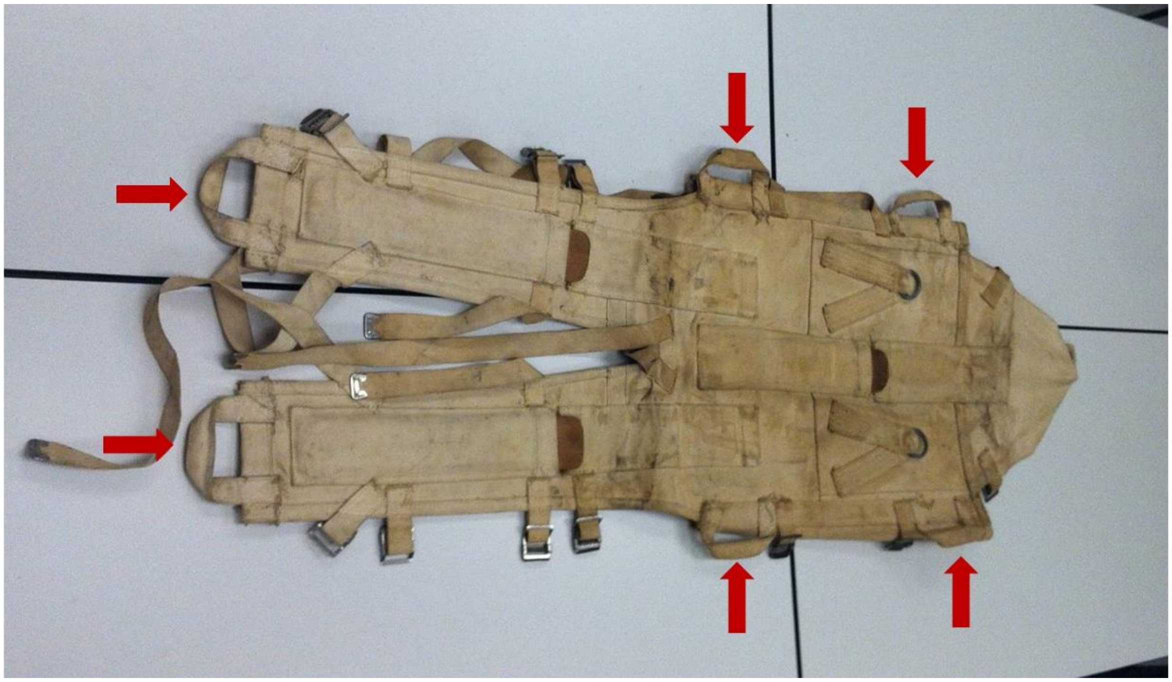
FIGURE 47. Stretcher; arrows point to the six hand holds (Author 2013)


FIGURE 48. Folded stretcher; notice two rings (Author 2013)

The litter folds into a 2 ft. by 1.5 ft. square, making it extremely portable (Figure 49). The core section and the leg supports have wooden wedges that fit neatly into six sewn pockets on the reverse of the object to give the litter a stiffness; it is otherwise a flexible construction (Figure 50). These small wooden wedges also ensure that the construction is very lightweight, as compared to a stretcher made completely of wooden boards, for example.

FIGURE 49. Stretcher shown in the folded position (Author 2013)

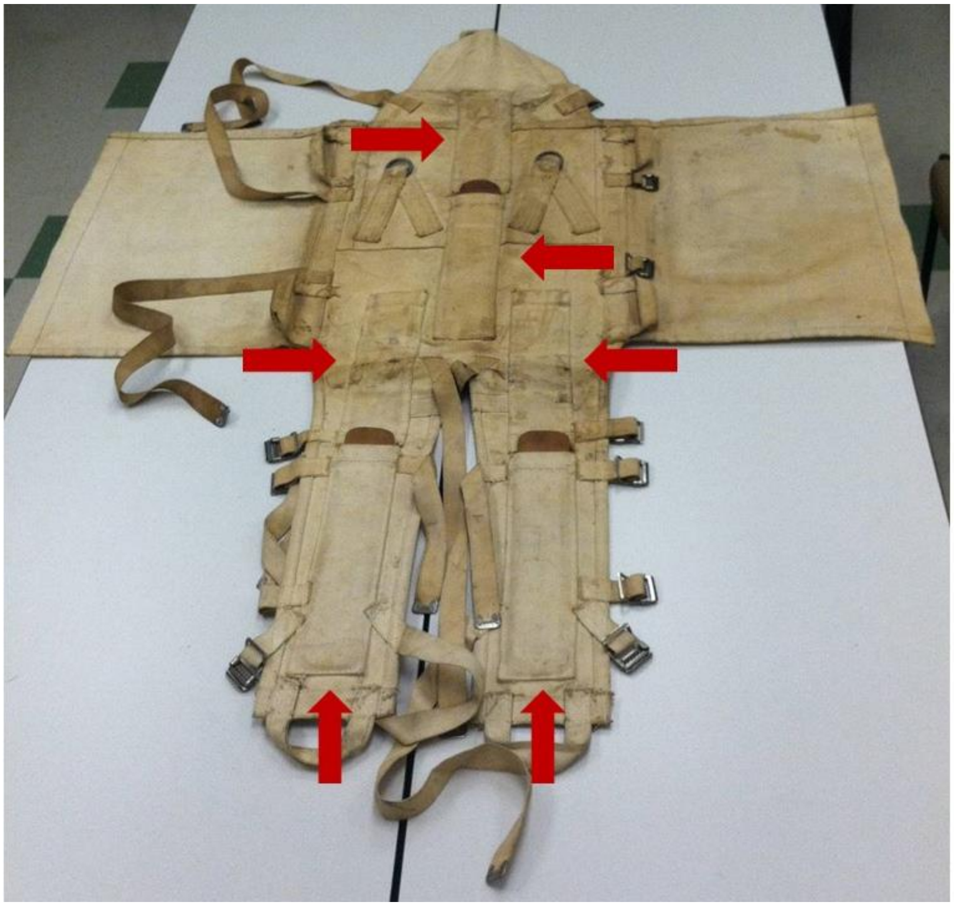
FIGURE 50. Stretcher; arrows point to the six support pockets (Author 2013)

While the *North Carolina* example fits the War Department's definition and requirements of a military litter (Table 1), it does not exactly match any of the stretchers shown in the manual (War Department 1945:36–51).

TABLE 1. Specifications for a military litter (War Department 1945:34–35)

Requisites of Military Litters. For satisfactory employment in the military service, a litter should fulfill the following requirements:	
A. Size	The size of the litter must be sufficient to accommodate individuals whose height and weight are within the maximum limits as prescribed by the Department.
B. Weight	The weight should be as light as possible without sacrificing necessary strength and durability.

C. Durability	The durability should be sufficient to withstand the rough usage encountered in prolonged field operation.
D. Type	It is desirable that the litter be collapsible in at least one axis to facilitate handling, storage, and movement to the point of use.
E. Standardization	It is also desirable that all litters be the same dimensions when open. This allows the patient to pass through the various echelons of medical service without being removed from the litter upon which he is originally placed, even though the evacuation journey involves the use of several different types of carriers. Such standardization will result in the saving of valuable time and obviate the danger to the patient resulting from changing litters. Standardization is highly desirable not only throughout the military service but also between the military and naval services to facilitate evacuation during joint operations.

Most likely, the *North Carolina* litter is a variation of the semirigid canvas litter. This category is very broad. Though the specifications indicate that semirigid litters should have four hand-holds to facilitate four-man carriage and four loops in which to insert carrying poles, it is possible that this construction differs because it was intended for carriage on the steep inclines of the battleship's stairs and through the ship's narrow hatchways (Table 2). Accessories like litter-carrying straps with hooks could make carriage of this specific litter, with its ring on the head piece, possible without poles (War Department 1945:111).

TABLE 2. Specifications for a semirigid canvas litter (War Department 1945:51)

Specifications: Semirigid Canvas Litter	
Length	72 inches plus 30 inches with straps.
Width	14 inches.

Bed	Semirigid canvas; with wooden supports, running vertically.
Straps	7 securing straps to ties in patient.
Accessories	Head piece to support patient's head. Hand-hold loops; two at each end, for four-man carries. Four loops for slipping poles through for carrying purposes.
Advantages	Patient held securely in position; movement in vertical direction is facilitated. Especially useful in evacuating from ships and in mountainous areas.
Remarks	Designed by Navy Medical Research Institute for use in combined operations.

The metal airplane, or Stokes, litter was very popular for naval operations, too (War Department 1945:47). The separated leg supports make the *North Carolina* example different from the average semirigid canvas stretcher, but would work well in a Stokes litter, which has separate leg compartments (Table 3). While the wooden wedges, meant to support the semirigid stretcher, negate the likelihood that this piece was solely used with the Stokes litter, its odd construction could indicate its design was meant for varied uses.

TABLE 3. Specifications for a Stokes litter (War Department 1945:47)

Specifications: Metal Airplane Litter (Stokes)	
Length	7 feet.
Width	23 inches.
Depth	8 inches.
Weight	31 ½ pounds.
Bed	Wire mesh netting, supported in a rigid frame of steel tubing. Lower half divided into two compartments to accommodate legs of patients.

Accessories	Securing straps at level of chest, thighs (2), and legs.
Advantages	Affords complete security for patient when litter is tilted.
Remarks	Extensively used by Navy; used in joint operations.

This *North Carolina* stretcher has four areas with pencil markings. Along the seam connecting the stretcher's core and head piece, there is an arrow and a line, respectively, pointing to each other (Figure 51). It may be that the line on the head piece is also an arrow, but the point is covered by the core section. On the forward side of each leg support there is a line drawn along seams toward the top of the construction (Figure 52). Additionally, the left and right middle leg straps have a scribble; perhaps an "L," "I," or "1," followed by a "-3" written on their front sides (Figure 53).

It is unlikely that the head piece was added retroactively, as head support would have been a necessary design feature. This suggests that these lines are reminiscent of the litter's construction. The lines near the top of the leg supports could point to modification, such as repairing a tear or re-supporting the area, but there is no indication of any such modification: no fabric was added and no rips are present. Finally, the two middle straps could have been retroactively added to the artifact, but their attachment to the main artifact matches the attachment style of the other eight straps.

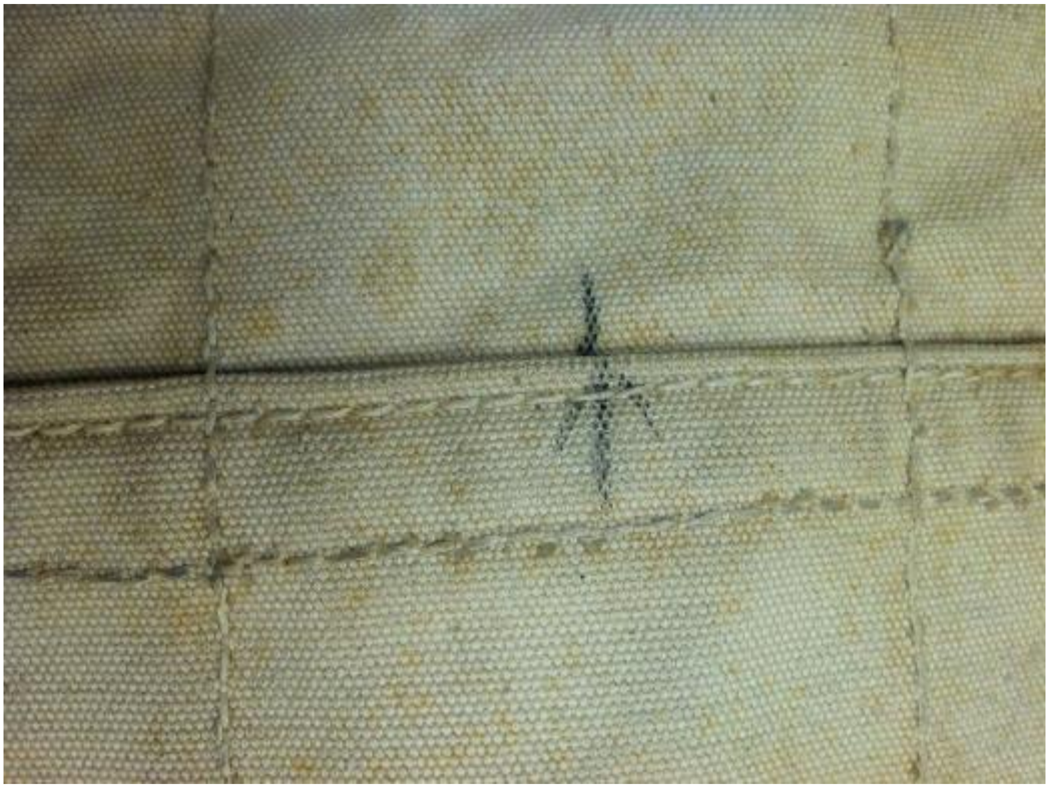
FIGURE 51. Arrow and line at the seam of the core and head piece of USS *North Carolina* stretcher (Author 2013)


FIGURE 52. Seam lines on the upper portion of USS *North Carolina*'s stretcher's legs (Author 2013)

FIGURE 53. Markings on the middle straps for the leg supports of USS *North Carolina*'s stretcher (Author 2013)

Alternatively, on the back of the right leg support there is a design drawn on the bottom wooden wedge pocket. The design is approximately half way down the pocket and depicts a partial trapezoid with a long thin oval at the top (Figure 54). Unlike the other pencil markings, this one does not appear to point directly to the construction of the litter, as it does not clearly denote a seam, connection point, component number, component shape, or the like. It does not show clear sign of modification either.

The construction markings could mean that the stretcher was constructed hastily before it was sent to the battleship. The creator(s) had plenty of material, the ability to put metal caps on the ends of each strap (Figure 55), and embedded a ring at the top of the head piece (Figure 56).The solid construction and finished nature of the artifact suggest that it was manufactured.

If the construction was more of an amalgamation of dissimilar materials, the stitching was less precise or poorly finished, or if the straps were not capped, the argument might be made that this object was designed and/or constructed onboard the ship. It appears, however, that this stretcher was merely hastily manufactured from a modified semirigid litter pattern (Figures 44, 45).

FIGURE 54. Markings on the wooden support pocket on the back of USS *North Carolina*'s stretcher (Author 2013)

FIGURE 55. Metal caps put on the end of each strap of USS *North Carolina*'s stretcher (Author 2013)


FIGURE 56. Ring at the top of the head piece on USS *North Carolina*'s stretcher (Author 2013)

CHAPTER 7: CONNECTING THE SLED, LITTER, AND PLOT WITH THE VISITOR

These three artifacts continue to add metaphorical chapters to their cultural biographies even today. Both the sea sled and stretcher are currently housed in collections storage. This “chapter” of their lives may be quite dull, but as long as the artifacts survive, their biographies continue. Conversely, the plotting board is not only on display, but it is continually used in the present. It is now an interpretive tool, instead of an integral part of the ship’s radar system, but it is still affecting interpreters' and visitors' perceptions of World War II history.

There are inevitably many options for sharing these artifacts’ histories, but one of the singular features of the battleship museum is that, although it has many different components, everything was connected and worked together to make it an effective war machine. These three seemingly unrelated objects can easily be connected to tell a single story. The connection expands their cultural biographies by placing the pieces within a broader history instead of focusing on the use-life of a single, or in this case a few, artifact(s).

There are obvious limitations to, and problems with, this particular approach. The first and most notable is that these artifacts would have been used and stored separately; they would be spread over the aft deck, in CIC, and in the sickbay. These stations are dispersed nearly the length of the ship and over several decks. Spatially, that makes co-interpretation very difficult. The following story, however, serves as an example of a way to re-interpret and connect disparate artifacts.

TELLING A SINGLE STORY

North Carolina played the important role of "home" to the men who served on board the ship. Their lifestyle is shared through the bunks, mess, lounge spaces, post office, laundry, and other spaces in the battleship museum. The ship was a fighting machine, too. Most of the elements onboard *North Carolina,* like the gun mounts, turrets, control rooms, and bridge, were to make the ship an effective war technology. The sea sled, plotting board, and litter are mundane objects associated with the latter of these tasks; however, they need not be separated from the men's stories. Take, for example, the story of John Burns.

Truk was a key Japanese naval base from 1941 to 1943. The atoll consisted of six major islands surrounded by a coral reef (Rems 2014:18). Realizing that it was vulnerable to attack, Admiral Mineichi Koga, commander of the Japanese Combined Forces, moved most of the force away from Truk; but, before the move was complete, Task Force 58 — including *North Carolina* — under the command of Vice Admiral Marc Mitscher, was ordered to bombard the island in "Operation Hailstorm" (Rems 2014:17–18). Throughout 17 and 18 February 1943, 14 Japanese naval ships and 32 supply ships carrying almost 200,000 tons of cargo were sunk. Additionally, approximately 270 Japanese aircraft were destroyed or damaged, leaving only about 100 operational craft. Two days later, Koga ordered the remainder of his air fleet off Truk (Rems 2014:20).

The atoll was continually bombarded throughout February, March, and April to prevent any new supplies from entering. Admiral Nimitz wanted to completely demolish Truk's defenses, so as to render the atoll useless to the Japanese (Rems 2014:19). Therefore, he sent Task Force 58 to the island again with orders to finish the destruction, via an air attack. When the U.S. Navy revisited the atoll on 29 April, there were approximately 104 operational aircraft and several small naval vessels present (Rems 2014:19–20).

From a distance of 150 miles, the task force sent 84 Hellcats toward the islands. There was heavy cloud cover that morning and Japanese radar was able to spot the incoming airplanes. In response, 62 Japanese Zeros were waiting for the incoming fighters. Of the 62 Zeros, 59 were shot down. The Hellcats also managed to destroy 34 planes on the ground, but missed many of the ground defenses because the cloud cover prevented clear sight (Rems 2014:19).

On 30 April, the American Hellcats and bombers returned. In total, only 12 Japanese airplanes escaped the slaughter and all the above ground defenses, along with approximately 20 ships, were destroyed. The task force also bombarded Satawan Island and Ponape Island as they left Truk; these attacks were similarly successful (Rems 2014:20).

During the two-day battle, 46 U.S. airmen in 21 planes crashed (Rems 2014:20). USS *Tang,* an American submarine, and several Kingfisher pilots were in charge of the rescue of these downed airmen (Figure 56). In one of the most famous American naval air rescue stories of World War II, Lieutenant (Junior Grade) John A. Burns, a daring *North Carolina* Kingfisher pilot, saved 10 airmen from the sea and/or from falling into Japanese hands off Truk Atoll on 30 April 1943. *Tang* was responsible for successfully saving 12 additional airmen from similar fates throughout the events on 29 and 30 April (NCBC n.d.:10).

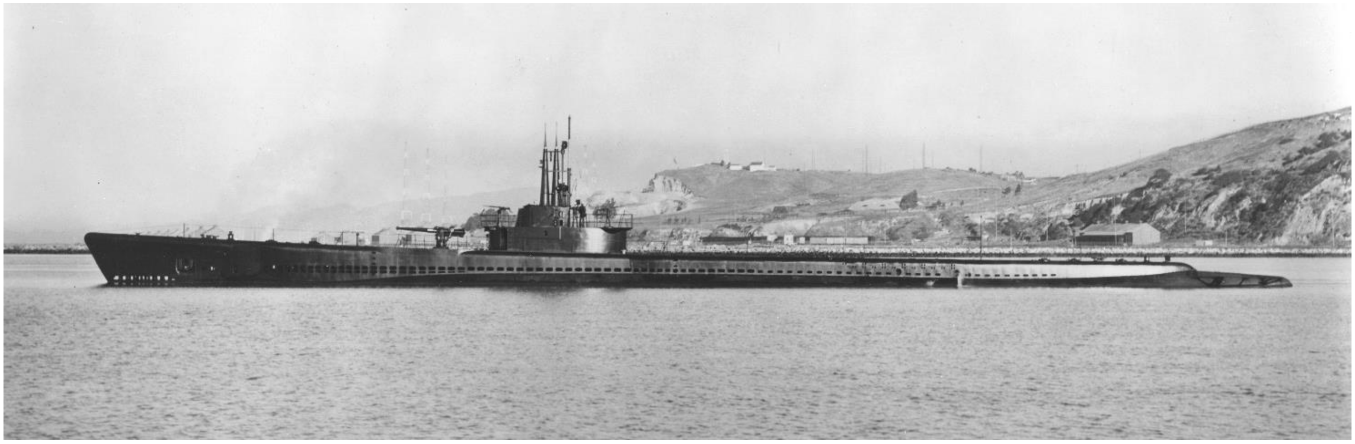
FIGURE 57. USS *Tang* (U.S. Navy 1943)

Burns had been on *North Carolina* since he was commissioned after flight training in January 1942 (Naval Aviation Museum 2016). He and his Aviation Radioman Second Class, Aubrey J. Gill, along with fellow Kingfisher pilot Lt. John J. Dowdle, Jr., and his Aviation Radioman Second Class, Robert E. Hill, were catapulted from the battleship at about 8 a.m. on 30 April in preparation for spotting and marking downed pilots for *Tang* to rescue (NCBC n.d.:9). When a U.S. fighter was shot down, a radio call would go out to both the Kingfishers and *Tang* with the fighter's location. This would allow the submarine, and the floatplanes, to converge on their point. Since the Kingfishers had a better view than the submarine, Dowdle and Burns were to signal *Tang* when they found a fighter (NCBC n.d.:10).

While Kingfishers were made for observation, they could also be used for rescue because they could taxi on the water; so, when Dowdle and Burns found Lt. j.g. Bob Kanze in the water, and with *Tang* nowhere in sight, the Kingfishers decided to retrieve the pilot for later transfer to the submarine (Galdorisi and Phillips 2008:78).

Dowdle first attempted the rescue. He successfully landed the aircraft on the water and taxied over to Kanze, but as Kanze reached out to grab onto one of the wing pontoons, a wave took his raft away. A second wave — given the added weight on one wing — capsized the aircraft, leaving all three men in the water (Galdorisi and Phillips 2008:78).

Careful not to repeat his colleague's mistake, Burns attempted to rescue the three men from the choppy waters. He approached parallel to the waves and was able to successfully retrieve all three airmen; two sat on the plane's wings and the third climbed into the cockpit with Radioman Gill. Even one extra body made the Kingfisher too heavy to take off, so with the added weight of three men, Burns had to taxi to the incoming *Tang.* He was able to deposit all three airmen on the submarine and took off again in search of more downed fighters. *Tang* shot Dowdle's capsized floatplane to prevent it from being captured by the enemy (Ramsey 2007:210).

After tagging several airmen in the water over a wide range, Burns had given *Tang* several hours of work. He worried that the submarine would not be able to make it to the aid of any other airmen for quite some time, so he decided to rescue Hellcat pilot, Lt. j.g. Robert T. Barbor. Burns, Barbor, and Gill sat together for a while, out of the range of enemy fire, until two additional bombers went down near their location. Burns approached.

At first, the Kingfisher attempted to tow the two rafts, but the airplane's attempt to taxi further to sea failed because the rafts were swamped. The downed airmen only had one choice: to climb on board the Kingfisher. This nearly capsized the plane, but Gill's quick thinking saved the craft. In the end, seven extra men clung to the floatplane: three on each wing and one on the fuselage (Gladorisi and Phillips 2008:80) (Figure 58).

Tang was busily rescuing other airmen closer to shore and in more dangerous water. It took the submarine nearly five hours to return to Burns, Gill, and the seven men (Gladorisi and Phillips 2008:80). When the submarine finally returned to retrieve the Kingfisher's load, the plane had been so badly beaten by the waves that the fantail of the craft had disappeared beneath the water and the main pontoon was flooded (Naval Aviation Museum 2016).

FIGURE 58. Burns' Kingfisher loaded with seven additional men (U.S. National Archives 1944)

Burns taxied his craft to the submarine and unloaded the seven airmen. He and Gill also boarded *Tang,* as it was clear their plane would not fly again. *Tang*'s crew sunk the hardworking Kingfisher with their 20-mm gun to keep it from falling into enemy hands (Ramsey 2007:212).

In all, more than half of the downed U.S. airmen from the Truk attacks of 29 and 30 April were rescued (Figure 59). The 22 men onboard *Tang* became a temporary addition to the submarine's crew for the trip back to Pearl Harbor (NCBC n.d.:10). From there, Burns was offered any station of his choosing (Ramsey 2007:213).

FIGURE 59. Rescued airmen onboard USS *Tang* (U.S. National Archives 1944)

He received the Navy Cross in March 1945 for his actions in Truk (NCBC n.d.:10). Unfortunately, the heroic Kingfisher pilot was killed stateside in a Hellcat training accident on 24 February 1945 (Battleship North Carolina Museum 2016).

Stories like the one of the April attacks on Truk and of the brave Kingfisher pilot who saved ten men, give opportunity to share the relationship between pieces of the material culture in *North Carolina*'s collection, namely the Kingfisher sea sled, the vertical plotting board, and stretcher(s).

Kingfishers were popular reconnaissance planes, but they were also very valuable for rescue missions because they could fly high, get a wider view of the area, and could land on the water to help retrieve any personnel. This made them versatile additions to their ships' complement.

After something was spotted, they would radio locations of both enemy and friendly craft to their ship. The radioed locations would then be plotted on a board, like the vertical plot, showing craft even at the periphery of radar's capabilities. When Burns was tagging downed airmen, a radio message of their location was also sent to the submarine. They would have had a plotting sheet, if not an actual board, on *Tang* where these airmen's locations would have been recorded to assist *Tang* in locating the men later.

Often, if the craft was going to retrieve personnel, as in Burns and Gill's first rescue, the individual would climb in with the radioman in the cockpit. The Kingfisher pilot could then taxi the individual to a friendly ship for retrieval. To effectively retrieve the Kingfisher, its crew, and any additional persons, its mother-ship would have a sea sled lowered into the water for the craft to taxi onto; allowing the aircraft to be lifted by crane.

Once onboard the ship, any injured men would be transferred to a stretcher and taken to sickbay. The advantage of rigid and semi-rigid stretchers, like the one discussed in Chapter 6, was obvious as one trekked the steep stairways and tight spaces of the battleship *North Carolina's* interior. "…As they entered the main deck hatch to go below, the stairways narrowed and steepened. Scaling them alone and healthy had taken training. Carrying an injured shipmate down them seemed almost impossible…" (Ramsey 2007:284).

These three artifacts, all used for different functions on *North Carolina,* had to work together for a singular purpose. When it came to Kingfisher rescue missions, the Kingfisher sea sled, the plot, and the litter played key roles in making the missions possible. Connections like this can easily be drawn between many parts of the ship and can be backed by artifacts and stories from the ship's history to enhance the visitor experience.

CHAPTER 8: CONCLUSIONS

The history, literature review, case studies, and connections found in the previous chapters are meant to show that a few integral, even mundane, artifacts can narrate stories like the attack on Truk Atoll and Burns' daring rescue. Because this example tells Burns' story through three key, mundane artifacts, visitors would theoretically leave with a better understanding of a person, the duties, and the importance of specific artifacts. In turn, this interprets a broad outline of a battle and the ship's function. By going in depth into the biographies of a few artifacts, a broader story emerges without trying to tackle the entire history of the ship or the war. By also interspersing *wh*-questions, like "*Wh*at role did the [insert artifact here] play in rescuing downed fighter pilots?" visitors may learn, discuss, and retain *North Carolina's* influence as a fighting unit, as a World War II artifact, as it relates to the people who lived onboard, and as part of the war's story.

BUILDING BIOGRAPHIES

Interpreting the complete biography of any one artifact can be quite difficult. Tracking details of an object from conception and design through production, original use, modification, and reuse to discard and a potential "second life" as part of an archaeological collection or a museum display, can prove difficult to impossible. Parts, or "chapters," of an object's biography, however, present themselves through the study of the artifact. With some research, these chapters can start to explain the artifact's history.

Study of the stretcher highlighted the presence of manufacturing details. This artifact is unlike the common semirigid litter because the leg supports are separated. While *Field Manual FM-85* (1945) states that variations could exist, the separation raised questions over the origin of construction; was this piece constructed onboard the ship? The pencil markings also point to speedy creation. While the object could have been constructed onboard, it seems unlikely for the following reasons.

Three of the four groups of pencil markings point to construction as they show seams, a joint, and potential component placement. While their existence indicates rapid construction, other details, like the similarity of component materials, the presence of metal grommets and an inlaid ring, and the quality of the stitching all suggest that the piece was, in fact, made professionally. The question is then, why are the leg supports separated? Research suggests that this could be a favorable feature onboard a ship so that this piece could be used in conjunction with a Stokes litter basket or to make it suitable for easy carriage through the steep and narrow passages and stairways.

The plotting board featured modification and signs of continual use. As radar technology improved throughout the war, it became possible to sight vessels farther and farther away. This meant that the vertical plotting board, which could plot up to 80 miles away, could not match the distances radar could detect. To improve the plotting board's range, the men likely retrofitted the board so that they could plot up to 180 miles away. This was evident by the distinct differentiation between the stamped distance ranges at the middle of the board and the hand drawn circles and ranges at the outer edges of the board.

Continued use could also clearly be seen as the board's stamped and hand drawn ranges were worn away in several areas. This was likely caused by continual plotting and erasure of the board's surface. While all three artifacts show evidence of their use, the plotting board is unique in that it has been continually used until this day. Even though the artifact's condition is stable, continued use would have continued to deteriorate the original surface. A restoration project was undertaken to restore this artifact as close to its wartime condition as possible, and a cover was added to allow continued use without new damage to the object's original surface. This will allow the plotting board to continue a new biography "chapter" as an interpretation tool that helps visitors understand and comprehend a tangible piece of radar technology's history.

Finally, the sea sled shows that utilitarian objects were integral to the success of more sophisticated technology, like the Kingfisher. Even a simply designed support tool, like netting attached to an iron bar, was necessary to make possible the use of something as complicated as a floatplane. Salt water is detrimental to the construction materials used in the sea sled, specifically iron, rope netting, and cloth. This means that the historic value placed on the sea sled can be seen through its current condition.

The fact that the sea sled, while fragile, is still mostly intact and in fair condition, reveals that this artifact was well taken care over the four years of hard use during the war. Crew oral histories suggest that *North Carolina'*s Kingfishers were used continuously and potentially flew more hours than many of their counterparts. If this is true, then the sea sled was also in use more often than many of its equivalents. Frequent exposure to salt water and hard use of such fragile materials suggest that this artifact should, likely, not have survived. The crew must have found great value in this mundane piece to take such good care of it.

These artifacts undoubtedly influenced the men who used them too. Their value as resources for integral technologies on the ship surely affected how the men viewed these technologies, their ease of use, and therefore life onboard. Because these are all mundane artifacts, they were likely overlooked and undervalued when held next to their more sophisticated corresponding items. This is corroborated by the lack of stand-alone mentions of these artifacts in the crews' oral histories. While their perceived value may have been tied to an integral piece of the ship's technology, their general stability and continued existence in the museum's collection suggests the mundane pieces were still well taken care of and appreciated for their function.

Each of these pieces showcases a different segment of its biography. From construction, to modification, to value assessed through care taken and current use-life, these pieces all interpret aspects of the battleship and the history of World War II. Their connection to the battleship's function is fairly evident. The plotting board assisted radar technology. The stretcher facilitated carriage of injured sailors. The sea sled made recovery of the Kingfisher possible. These functions can even be tied together through historic stories, like that of John Burns.

Observation planes and plotting crews often worked together. Either Kingfishers spotted downed aviators for the plotters to post, or alternatively, plotters located down aircraft and direct Kingfishers to their locations. Then, the planes could rescue downed pilots and taxi them back to the ship. From there, a sea sled would facilitate the aircraft's recovery before the injured sailor was transferred on a litter to sickbay.

More difficult to see are these artifacts' stories about the larger war effort. The stretcher shows hasty construction of, and under documented variation in, wartime necessities. The plotting board shows rapid improvements in wartime technology. The sea sled shows experimentation in construction techniques and how a relatively simple object was necessary to make a much more complex unit work.

RELATING TO THE PUBLIC

People learn through interaction, connection, and discussion. The USS *North Carolina* Battleship Memorial is an immersive and interactive environment. By further connecting the artifacts to each other and to relatable, intriguing, stories about people, visitors can more easily connect with the stories.

Stories like that of Lt. (j.g.) John Burns are compelling because they promote empathy. Imposing and impressive artifacts, like the Kingfisher, are likely to gain a person's attention, especially when attached to the story of a relatable person. After intriguing the visitor, mundane artifacts can show comprehendible links to other locations, technologies, or people. This weaves a web, so to speak, that explains the larger unit.

More sophisticated technologies or strategies seem less complicated when one understands the pieces that make the process possible. Using mundane artifacts, like the three in this thesis, simplifies these complex strategies or technologies to their most basic elements. Instead of trying to explain a complicated and expansive technology or story, a single component of that story can be explained as an example and the larger story can be inferred.

Simultaneously, elements of the mundane artifacts, like the stretcher's pencil markings, the evolution of the sea sled's design, or the plotting board's expanded range circles are tangible examples of the larger war story. They show the need for hasty construction to support the war effort, experimental and evolving design, and improved technology, respectively.

CONCLUSION

Mundane artifacts provide an opportunity to take a complex unit to its more basic and relatable elements. Many people may struggle to connect with larger ideas, like the technology of radar, the use of Kingfisher floatplanes, or the horrors of war. Using the plotting board, sea sled, and stretcher to share these stories makes the larger ideas more understandable. When combined with human stories and eye-catching artifacts, like the Kingfisher, mundane objects can then share well-rounded, interconnected, stories on many levels. These stories can be as simple as the artifact's immediate use, while still connecting to share the battleship's purpose and showcasing elements that implicate larger concepts like technological innovation and wartime production.

These artifacts were functionally necessary to make the larger unit run. While their value may have been overlooked, as seen in the lack of specific mentions in the oral histories, because they were mundane and directly related to more complicated, "influential," or flashy artifacts and technologies, they can be valued today for their explanative uses. Their biographies endure through their museum "chapter." Continuing to view them as unimportant diminishes their value as relatable components of the larger story. Instead, using them can make interpretation — from basic explanations of their uses to the more complex wartime implications on technology and production —

more understandable to the general public. This creates a more complete history. The battleship *North Carolina* did not survive solely off large or ostentatious components. Smaller components made everyday operation of those showy pieces possible. Presenting even these stories makes the history more complete and more understandable.

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