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From Gunboat to Garbage Can: The Conservation of a Cannonball

Part 3

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From Gunboat to Garbage Can: The Conservation of a Cannonball *Part 3*

By Ashley Deming, Maritime Archaeologist, SDAMP Manager

The cannonball has now undergone the electrolysis process for 7 months. After the first four months, I removed the ball from the solution, removed any of the active corrosion present and rinsed it thoroughly. I noticed a few soft spots that were a little deeper than I would like. I cleaned them out gently using dental tools to remove all of the soft particulates from the rest of the harder iron. The spots turned out to be more like holes resembling a vampire bite (Figure 1). Each hole was about 1 inch deep toward the center of the ball. I was pretty worried about this, so I gave our cannonball conservation expert Freddie Clark a call. He assured me that this sort of thing happens all the time. Some areas just corrode differently to others depending on the age, material, and what conditions it was in underwater. Feeling slightly reassured that I hadn't caused this development, I finished cleaning the ball and resetting the wire attachments. I rotated the hose clamp about 45° to expose the areas that were underneath during the previous three months. This must be done each time the solution and attachments are changed out.

There certainly was a lot of corrosion happening to my anode (stainless steel trashcan). It had completely disintegrated due to rusting. The ends of my wires were fried and I had to replace the alligator clips holding everything together at least twice over the first three months of electrolysis.

Figure 1
Vampire bite soft spots

For some reason, the 26-gallon plastic garbage can we were using for the tank got very soft and sprung a slow leak at the bottom. I had to replace all of these components. I replaced the connections with new copper wiring and steel clips, Carl and I screwed three steel sheets together to create a ring to serve as the new anode, and Freddie Clark donated a 30-gallon plastic drum to our cause (Figure 2). Thanks, Freddie! I changed out the solution for a fresh batch and placed the cannonball back in for another three month treatment.

Over the following three months, the amount of corrosion off the ball significantly decreased. The steel plates held up well as did the clips (Figure 3). This leads me to believe that the iron of the cannonball is becoming more stable. I made sure to check in on the set up at least once a week to make sure all of the wires and clips were still attached and it was still running happily at ½ an amp. Thanks to the new white plastic drum, I could really see the ball in the solution to monitor its progress. The sodium carbonate and water solution should remain clear during the electrolysis process. If at any time it becomes cloudy, the balance of the chemicals is off and the solution should be changed to correct the problem.

Figure 2
Our new, non-leaking 30-aallon drum

At the end of these three months, the ball was removed from the solution for the third round of cleaning and solution change. The was very little flaking off of corrosion

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Figure 3
New steel anode ring and rust build up after a 3-month period of electrolysis

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Figure 4
New soft spot at 7 months

during this cleaning phase. I first rinsed the ball in fresh water to remove the thin black film that forms on the ball during the process. I also used a soft toothbrush to remove the white particulate matter that formed as a result of the solution. I continued to use dental tools to gently remove any sloughing pieces of active corrosion.

Unfortunately, I did notice a couple more soft spots similar to the "vampire bites" of the previous cleaning stage. Figure 4 shows the deepest of these spots. The hole extends towards the center of the ball about an inch deep. I did my best to clean out all the active corrosion. I am still hoping for the best. These relatively small areas are very solid around them, so they may not affect the surrounding iron much more than they already have. When the electrolysis process is complete, we will most likely use a wax solution to fill these holes to protect from any further corrosive activity.

Once the ball was clean, the solution was changed as well as the copper wire and the clips. The hose clamp was rotated about 45°. I kept the steel plates the same as they still had enough good metal to use. We may have to change these in the middle of the next three months if it looks like we are not getting a good connection any longer… *Read more about the conservation process in the next issue.*■

Cannonball immediately after brought up

After initially corrosion removed

After 1-month cleaning

After 4-month cleaning

After 7-month cleaning

Hobby Diver of the Quarter

This section of the newsletter is devoted to the hobby diver who goes above and beyond the call of duty. He/she has submitted excellent reports, been an exceptional volunteer, has gone out of their way to preserve cultural and/or natural heritage in the state, or has been a general inspiration to other licensees, the public, or us.

Each quarter we will pick a licensee that resembles one or more of these noteworthy traits. Hopefully, it will be you! If you know of someone who fits some or all of these categories and would like to nominate them, please send us a brief email of who and why you think they should be Hobby Diver of the Quarter.

The honor of Hobby Diver of the Quarter for Quarter 3 2011 goes to Bottom Time Scuba Club, LLC. The Bottom Time Scuba Club has always been strong supporters of our program and invited us up to Florence to present to the club on numerous occasions. We really enjoyed spending time with all of the club members and their enthusiasm for diving, our program, and maritime archaeology in South Carolina. We were very sorry to hear that Bottom Time Scuba Club has recently disbanded. However, that didn't stop them from supporting our program by donating a brand new digital projector for our education and outreach programs. Their generosity and continued support has been overwhelming. We wish all of the previous members good luck in their diving adventures and hope they stay in touch.

Thank you, Bottom Time Scuba! You were truly an inspiration to dive clubs everywhere!■