Report On Phase One Conservation–Restoration

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Remove projectile and propellant (if any) and save for future research. Appendix "C"

Image of bore and ball as received.

After water blasting and scraping bore to remove expanded rust

The ball has been stuck / rusted in the barrel since 1899 and probably many years before. A charge of dynamite was exploded in the barrel in front of the ball in 1899 bursting the barrel into several pieces and driving the ball back against the front chamfer of the powder chamber. The barrel bore and ball has been exposed to the outside elements with the bore full of rain water most of the year since c1955. The vent hole was found blocked and peened over on the outside flash pan. It was presumed that the barrel was loaded with propellant powder and the vent spiked (a practice used by the British Military using a hardened steel tapered rod driven into the vent hole and broken off at the outside) to prevent the firing of the barrel.

Rust dust from scraping between ball and bore.

Flame heating the ball for over one hour.

After repeating the process several times - water blasting and scraping the bore and using narrow blade knife scrapers between the ball and the barrel it was found that there was very little windage (clearance between the bore and ball) and that even after scraping out the rust between the bore and ball to the balls maximum diameter the ball was still stuck fast. A 2m length of 50mm steel water pipe (much softer than the cast iron ball so as not to injure the ball) was used as a rammer to try and jolt the ball loose, and a 1.8m heavy crow bar with a 50mm wide chisel end driven between the bore and ball failed

to loosen the ball. Because the barrel was presumed to be loaded with powder, flame heating the ball was unsafe. To neutralise the possibility of igniting the powder the position of the vent hole was located and the spiked / blocked vent hole drilled / cleaned out, a very difficult process using a specially made long drill bit. The chamber was found to be dry with some traces of powder being removed on the drill bit. The powder chamber was filled with water from the nozzle of a water blaster, followed by the chamber being pressurised with compessed air (140 lbs/sq") and the bore filled with water to check if there was any possibility of the air pressure blowing the ball forward or air leakage passing between the bore and the ball, no movement or leakage detected. After placing the bore muzzle facing into a clay bank (in case the remaining powder charge was ignited blowing the ball out) an oxy-acetelene torch was fixed in position and used to heat the ball for over one hour, the heat being transferred from the ball through the rusted contact area to the barrel which was too hot to touch. Cold water was poured onto the ball which contracted the ball and boiled the water. The boiling water created mechanical agitation between the ball and barrel powder chamber chamfer loosening the rust holding the ball to the barrel. After a few strikes with the heavy tube rammer (whilst the water was still boiling) followed by the wedging action of the chisel end of the crow bar rammed down between the ball and bore the ball came loose and while still hot was removed.

Left image: Ball as removed (still hot) showing side facing powder chamber. Compared to right image: outer side (rust flaked off) with bore / chamfer contact join line (lower) and showing small casting imperfections (holes). The standard nominal ball diameter c1800 for an 18 pounder was 5.04". This ball measured 5.08" maximum diameter includes light surface rust.

Left image: outer side (rust flaked off) with bore / chamfer contact join line and showing small casting imperfections (holes). Right image: showing the wide ball / chamfer contact area and the reduced diameter of the powder chamber still wet, since cleaned out.