Queen Anne's Revenge
Shipwreck Project

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Queen Anne's Revenge Site
Iron Shot Report

Nathan C. Henry
NC Underwater Archaeology Branch

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Underwater Archaeology Branch
Office of State Archaeology
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Cover photo: Queen Anne coin weight for 1 guinea gold coin. Recovered from site Fall 2006

It is premature to say much about the composition of iron shot on the *Queen Anne's Revenge* (*QAR*) shipwreck site due to the small sample size available for detailed analysis. Nevertheless, shot dimensions shown in Table 1 have implications concerning the ship's compliment of artillery. It is logical to assume that if there was ammunition, there should have been a weapon to fire it. This assumption, however, must be seen in light of gun founding and gunnery practices of the early eighteenth century. To avoid jamming in the bore, shot had to be incrementally smaller than the diameter of the bore, this difference being the windage (see Table 1). Cutting the bore on an iron gun, however, was difficult and tight dimensional tolerances impossible to attain (Brown 2005; Kennard 1986:16-18). As Table 2 shows, dimensional tolerances for iron shot were similarly unpredictable. The gunner could not assume that a particular 6-pounder shot would fit into every 6-pounder cannon. Each shot was measured to ensure adequate windage for each particular gun. In reality any size shot that could roll down a gun's bore could be fired from the gun because wadding provided the gas seal. For accuracy and minimal wear on the gun, the largest diameter shot that could be safely fired was required (Muller 1965:40).

English Guns	Caliber (English Inches)	Shot diameter (in.)	Minimum Windage (in.)
1-pounder	2.019	1.923	0.10
2-pounder	2.544	2.423	0.12
3-pounder	2.913	2.775	0.14
4-pounder	3.204	3.053	0.15
5-pounder	3.45	3.288	0.16
6-pounder	3.668	3.498	0.17
7-pounder	3.861	3.679	0.18
8-pounder	4.038	3.846	0.19
9-pounder	4.20	4.00	0.20
10-pounder	4.349	4.143	0.21

Table 1: Calculated minimum windage based on dimensions provided by John Muller (1780).

Table 2 shows *QAR* iron shot divided into English poundage classifications but retaining the ancient Saker nominal classification. A Saker, by the beginning of the eighteenth century was capable of firing a ball of about 3.5 inches diameter or about 5.25 pounds (Brown and Smith 2005).

Field Number	Shot diameter-inches	Cal-Eng
344.015	1.5	1/2 lb
418.016 (load)	1.50	1/2 lb
418.009 (load)	1.81	1 lb
325.006	2.25	2 lb
460.003	2.4	3-pdr.
345.010	2.4	3-pdr.
345.013	2.5	3-pdr.
418.023	2.5	3-pdr.
350.033	2.50	3-pdr.
366.004	2.52	3-pdr.
354.001 (bar)	2.60	3-pdr.
245.001	2.72	4-pdr.
366.005	2.73	4-pdr.
366.003	2.80	4-pdr.
366.027 (load)	2.85	4-pdr.
344.007	3.0	4-pdr.
011.000	3.13	Saker/6-pdr.
366.007	3.23	Saker/6-pdr.
449.005	3.3	Saker/6-pdr.
496.014	3.3	Saker/6-pdr.
498.007	3.3	Saker/6-pdr.
233.003	3.30	Saker/6-pdr.
366.002	3.35	Saker/6-pdr.
233.002 (bar)	3.37	Saker/6-pdr.
418.022	3.4	Saker/6-pdr.
498.006	3.4	Saker/6-pdr.
498.012	3.4	Saker/6-pdr.
366.006	3.43	Saker/6-pdr.
344.014	3.5	Saker/6-pdr.
497.007	3.5	Saker/6-pdr.
233.010 (load)	3.50	Saker/6-pdr.
366.060	3.50	Saker/6-pdr.
353.001	3.50	Saker/6-pdr.
366.008	3.50	Saker/6-pdr.
418.055	3.50	Saker/6-pdr.
118.001	3.57	6-pdr.
342.002	3.6	6-pdr.
448.006	3.6	6-pdr.
366.074	3.60	6-pdr.
342.001	3.65	6-pdr.
342.001	3.7	6-pdr.
010.000	5.63	24 lb

Table 2: Chart showing forty *QAR* cannon shot recovered and analyzed

These size classifications were based on theoretical shot calibers calculated by John Muller (Table 1) and real world values provided by Ruth Brown and Robert Smith (Muller 1965:6; Brown and Smith 2005). For simplicity's sake when assigning shot to a particular caliber, .2-inch below the theoretical caliber diameter was considered the dividing value. However with this done there was no clear grouping of shot dimensions according to caliber, as Table 2 shows. Nearly sixty percent were of a size that would be suitable for 6-pounder cannons. This should not be surprising because seventeen of twenty-five of the identified cannons on the *QAR* site or sixty-eight percent are of that size. The remaining armament includes four 4-pounders, two 1-pounders, one ½- pounder and a small caliber brass swivel gun (Henry 2009).

Figure 1: The above photographs show three types of shot found on the *QAR*. To the left is Bar Shot, in the middle is Round Shot and on the right is Hammered Bar Shot

Two bar-type shot are included in Table 1, a 6-pounder double-headed shot and a 3-pounder hammer shot. The single 24-pounder shot is an anomaly because no guns have been identified on the *QAR* site that could closely accommodate the shot. It is either intrusive or was being carried aboard the ship for purposes other than ammunition.

References

Brown, Ruth

2004 *Report No. 045, Robinet-QAR*. Manuscript on file, North Carolina Underwater Archaeology Branch, Kure Beach, North Carolina.

Brown, Ruth and Robert Smith

2005 *Report No. 047, Iron Gun 173, QAR*. Manuscript on file, North Carolina Underwater Archaeology Branch, Kure Beach, North Carolina.

Henry, Nathan C.

2009 Analysis of Armament from 31CR314: *Queen Anne's Revenge* Site. *Queen Anne's Revenge* Shipwreck Project Research Report and Bulletin Series, QAR-B-08-02, North Carolina Department of Cultural Resources, Raleigh.

Kennard, A.N.

1986 *Gunfounding and Gunfounders: A Directory of Cannon Founders from Earliest Times to 1850*. Arms and Armour Press, London, United Kingdom.

Muller, John

1965 *A Treatise of Artillery*. Reprint of the 1780 edition. Museum Restoration Service, Ottawa, Ontario, Canada.