Reexamination of the Operational Capabilities of the Ancient Roman Onager Device

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The objective of this project was to explore a multidisciplinary re-evaluation of the fabrication and operations of an ancient Roman artillery machine known as the Onager. There is little historical information on this siege engine device; however, an account by a Roman historian named Ammianus provided the primary guidance in this recreation and reexamination. The project utilized previous parts created from another senior design group in order to successfully fabricate the device. The successful operation and the ability to test the Onager were based primarily on applying the correct methods and techniques in assembly. Fabrication of the Onager also encompasses creating the ideal type of projectile to use. Various projectile sizes were designed and created via a 3D printer and using cast mortar. Different variations of ropes were also tested for further comparison of the operational capabilities, such as the Polyester and Polypropylene types.

Experimental results were then found for the Onager by testing each combination of ropes and projectiles. The tests yielded results that revealed a wealth of information. The polypropylene rope had more consistent data than the polyester; however, the overall distances were not thrown to expectations. Comparisons with other modern scholars implies that the results for this Onager should have reached distances up to 100-150 yards as opposed to the highest of 80 yards. As expected, the smallest projectile traveled the largest distance. For future considerations, incremental sized projectiles between the already sized, small, medium, and large should be developed in order to test for an asymptote in the range. Also, for the ropes, consistency is valuable. This means that the ropes need to be pre-stressed and assembled to its maximum tension.