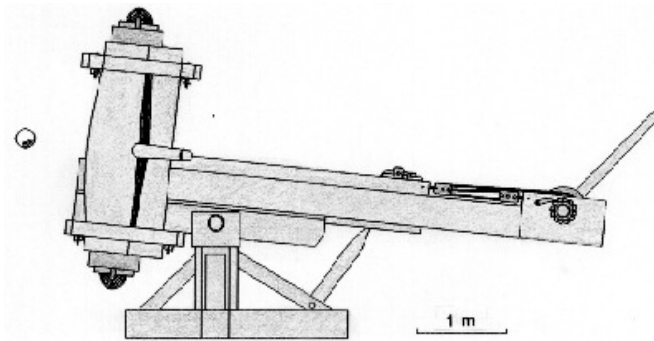




CATAPULTS IN GREEK AND ROMAN ANTIQUITY

PALINTONON - two-armed torsion catapult, heavy stone-thrower

Stone-throwers were built from mid fourth century BC onward, but only after several stages of development the mature standard type of the palintonon appeared in the third century BC. The reconstruction sketch drawn after the text of Philon, *Belopoeica* shows a heavy palintonon for throwing 1/2 talent (ca. 13 kg) stone balls. The total weight of this weapon was about 3 metric tons, the weight of the elastic ropes of the two torsion springs alone ca. 330 kg. In contrast to the euthytonon the palintonon could easily be dismantled into the main components: the two torsion springs with their wooden frames, the long



stock (table, ladder and slider) together with winch and pulley, also the carriage. Because of the heavy weight and the sheer size of the palintonon dismantling was indispensable, otherwise the machine could not have been transported over the often poor and narrow roads of Antiquity. The stone balls were fired generally in a flat trajectory, not in a high one as often mistakenly assumed in modern literature.

The two-armed torsion stone thrower was still employed in the early Roman Imperial period. The Roman author Vitruvius provides a description of the palintonon under the latin name *ballista* (X.11: *De ballistarum rationibus et proportionibus*).

ONAGER - one-armed torsion catapult, stone-thrower

The torsion spring of the onager is arranged horizontally. The weapon imitates the staff sling, a particular type of hand sling for throwing small stones. The one-armed stone-thrower comes quite late in Antiquity. The first one to describe the onager was Ammianus Marcellinus in mid-fourth century AD (Ammianus XXIII 4.4-7). In the Republican period and in the early Imperial period the Roman army was not equipped with such a type of catapult.



Reconstruction by E. Schramm. For construction plan and description see: Schramm 1918, 70-74 pl.10; Marsden 1971, 249-265.

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Vers. 22 June, 2001