



CATAPULTS

in Greek and Roman Antiquity

History

Catapults were invented about 400 BC in the powerful Greek town Syracuse under Dionysios I (ca. 430-367 BC). The Greek engineers first constructed a comparatively small machine, the [gastraphetes](#), sort of a crossbow. The gastraphetes was powered by a specially large composite bow. The military effect of the new weapon during the siege of Motya (Sicily) 397 BC encouraged the Greek engineers to enlarge the machine further. They put a larger gastraphetes on a carriage and added a windlass to cock the heavier machine. Certain physical barriers prevented further enlargement of the composite bow. Therefore in mid-fourth century BC torsion springs were introduced instead of the composite bow. The torsion spring consisted of a bundle of rope made from horse-hair or sinew. Such a spring could be enlarged indefinitely. The new catapults were equipped now with two torsion springs powering the two arms of the catapult. Very soon the new design superseded the old gastraphetes machines. Alexander the Great already employed torsion spring catapults on his campaigns. All Hellenistic armies and all powerful Greek cities soon owned a park of torsion artillery. Inscriptions from the Chalkothek on the Acropolis of Athens first mention torsion spring catapults there about 330 BC. - In the 3rd century BC the two main types of catapults were standardized: the [euthytonon](#) for shooting arrows and the [palintonon](#) for throwing stone balls. They now could be built after the standard calibration formulae laid down in contemporary technical treatises. In this form Carthage and Rome also adopted the heavy weapons. - This type of Hellenistic torsion artillery still was employed under Augustus, when Vitruvius wrote his work. About 100 AD the Romans redesigned the torsion artillery, developing quite different new arrow-shooting machines. They are first shown on Trajan's Column in Rome. The new catapult types remained in use until Late Antiquity. In this period also another type of stone-thrower was employed, the [onager](#).

Representations in Ancient Art

There are only few representations of arrow-shooting catapults in ancient art:

Balustrade relief from the Athena sanctuary, Pergamon; 2nd century BC (Berlin, Pergamon Museum)

Cupid gem; Late Hellenistic or Augustan (from the Tommaso Cades collection)

Relief from Rome, Armilustrium(?); Flavian (Florence, Palazzo degli Uffizi)

Relief on tombstone of Vedennius, Rome; end of first century AD (Rome, Musei Vaticani)

Several reliefs on Trajan's Column, Rome.

Photos of the reliefs are reproduced in: Schramm 1918 - Marsden 1969 - Baatz 1994 (see bibliography)

No representation of a large, stone-shooting machine is known so far.

Ancient Technical Treatises

From the 3rd century BC onward Greek and Roman engineers published detailed treatises describing catapults. Most of them were provided with [technical text figures](#). They supply basic knowledge for the understanding and reconstruction of the weapons. The most important are:

Philon, *Belopoeica* - Heron, *Belopoeica* - Vitruvius, *De Architectura* vol. X.10-12

Pseudo-Heron, *Cheiroballistra*.

The texts are published with English translation in: Marsden 1971 (see bibliography).

Archaeological Finds

The first find identified was excavated in Ampurias (Spain) and published in 1914. Only from the seventies of our century onwards more finds came to light from all over the Ancient World:

Gornea and Orsova (Romania); Sunion and Ephyra (Greece); Cremona (Italy); Auerberg (Germany); Azaila and La Caridad (Spain); Bath and Elginhaugh (Great Britain); Lyon (France); Pergamon (Turkey); Hatra (Iraq); Pityus (Georgia); Mahdia (Tunisia); Sala and Volubilis (Maroc). The new finds considerably improve our knowledge and throw light on certain trends of ancient technical development. For publication of finds see bibliography.

[Catapults in ancient art version](#)

[Archaeological finds](#)

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