

A device before its time

"Odsbody! the turkeys in my pannier are quite starved"

The First Part of King Henry IV: Act 1, Scene 1

That quote is a (belated) seasonal example of a Shakespearean anachronism. The more usual one is the striking clock in *Julius Caesar*. Shakespeare knew about such timekeepers; Caesar's Romans only had sundials and the clepsydra (water timer). Or did they? The technical know-how of the ancient world never ceases to surprise, and the loss of such knowledge is just as fascinating as (and more baffling than) its acquisition, as the Antikythera mechanism shows.¹ This motley collection of 80 or so damaged and encrusted bronze fragments was found in a Roman shipwreck at the bottom of the sea near the Greek island of that name in 1901. The ship sank around 65 BC. The parts are too fragile to be moved from the National Archaeological Museum of Athens, Greece, and missing items are unlikely now to be found. But today's technology has been brought to bear on the surviving pieces and is revealing more about what the mechanism did, how it worked, and what the complete object might have looked like.

An early attempt to solve the puzzle was by Derek J de Solla Price,² perhaps better known for his work on scientometrics. The device acts as an astronomical calendar or calculator, focused on the position of the sun and on the various lunar cycles, with the extra functions of eclipse prediction and calculation of the positions of some planets. Such interpretations were disputed at first. The ancient Greeks, it was thought, were too interested in philosophy and theatre to be bothered with or have the technology for something as rudely mechanical as this. However, the dating does seem to be sound and an elaborate hoax of more than Piltdownesque proportions can be ruled out. Others, such as Michael Wright,³ carried on where Price left off. The latest findings, which make use of three-dimensional CT scanning and other techniques, are significant, not least for the increase (from Price's 923 to 2160) in the legible letters inscribed on the front and back of the machine.^{4,5} Greek lettering changed over the years—for example, Π was written with unequal legs from around 2100 years ago—and epigraphy now dates the mechanism as being a little older than previously thought, at 150–100 BC.



Antikythera mechanism

There is no evidence of a spring and the mechanism was probably hand-cranked, but it has a complex system of around three dozen gears and its engineering was not to be matched for over 1000 years when something similar but simpler was constructed in the Islamic world. And a few hundred more years were to elapse before the striking clock arrived. Lost technology is an intriguing topic but all too often the only evidence offered for claims about ancient interplanetary travel and flying machines, to take two unlikely sounding examples, is inscriptional and open to different interpretations.⁶ And even solid objects such as the Baghdad "battery"⁷ are of uncertain function. The Antikythera mechanism is different and leaves one to marvel at the ingenuity of its construction and the intelligence behind its principles—and at the loss of both for a millennium.

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- 1 The Antikythera Mechanism Research Project. <http://www.antikythera-mechanism.gr> (accessed Dec 20, 2006).
- 2 de Solla Price DJ. An ancient Greek computer. *Sci Am* 1959 (June): 60–67. <http://www.giant.net.au/users/rupert/kythera/kythera3.htm> (accessed Dec 20, 2006).
- 3 Wright MT. Understanding the Antikythera mechanism. <http://www3.imperial.ac.uk/portal/pls/portal-live/docs/1/7279985.pdf> (accessed Dec 20, 2006).
- 4 Freeth T, Bitsakis Y, Moussas X, et al. Decoding the ancient Greek astronomical calculator known as the Antikythera mechanism. *Nature* 2006; **444**: 587–91.
- 5 Charette F. High tech from ancient Greece. *Nature* 2006; **444**: 551–52.
- 6 Hancock G. Fingerprints of the gods: a quest for the beginning and the end. London: Mandarin, 1996: 389–402.
- 7 Wikipedia. Baghdad battery. http://en.wikipedia.org/wiki/Baghdad_Battery (accessed Dec 21, 2006).