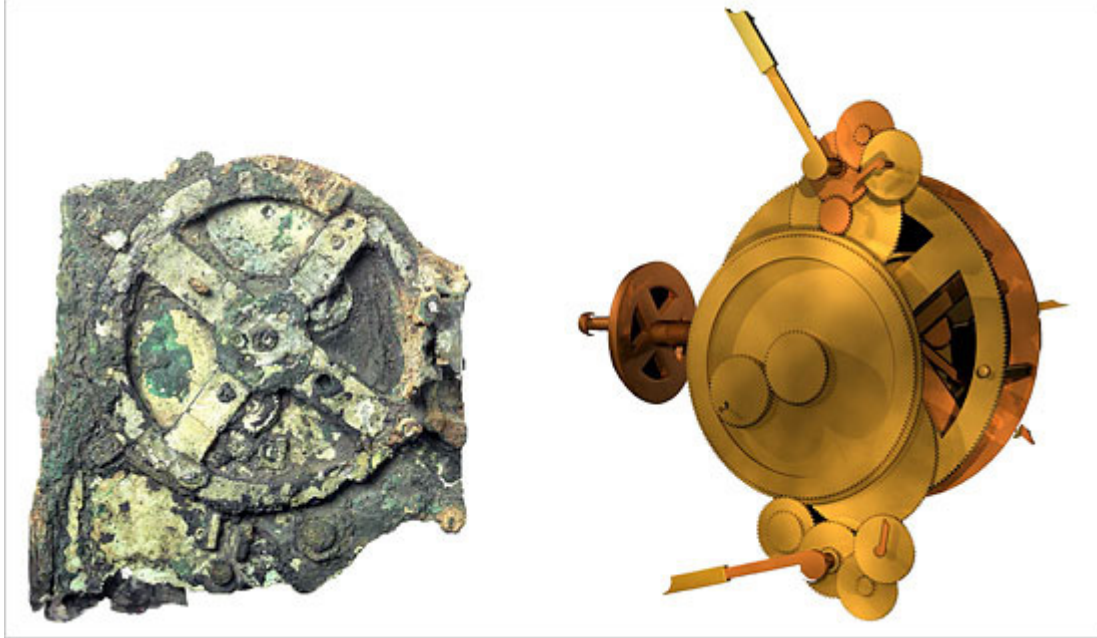


<http://www.antikythera-mechanism.gr/>



Fragments of the mechanism and a rendering of what it may have looked like. (School of Physics and Astronomy, Cardiff University)

Ancient Greeks had a computer that is really 1.0

By **John Noble Wilford** / The New York Times

Published: November 30, 2006

A computer in antiquity would seem to be an anachronism, like Athena ordering takeout on her cellphone.

But a century ago, pieces of a strange mechanism with bronze gears and dials were recovered from an ancient shipwreck off the coast of Greece. Historians of science concluded that this was an instrument from the second century B.C. that calculated and illustrated astronomical information, particularly phases of the moon and planetary motions.

The Antikythera Mechanism, sometimes called the world's first computer, has now been examined with the latest in high-resolution imaging systems and three-dimensional X-ray tomography. A team of British, Greek and American researchers was able to decipher many inscriptions and reconstruct the gear functions, revealing, they said, "an unexpected degree of technical sophistication for the period."

The researchers, led by Tony Freeth and Mike Edmunds, both of the University of Cardiff in Wales, reported the results of their study Thursday in the journal *Nature*.

They said their findings showed that the inscriptions related to lunar-solar motions and that the gears were a mechanical representation of the irregularities of the moon's orbital course across the sky, as theorized by the astronomer Hipparchos. They established the date of the mechanism at 150 to 100 B.C.

The Roman ship carrying the artifacts sank off the island of Antikythera around 65 B.C. Some evidence suggests that the ship had sailed from Rhodes. The researchers speculated that Hipparchos, who lived on Rhodes, might have had a hand in designing the device.

In another article in the journal, a scholar not involved in the research, François Charette of the University of Munich museum, said the new interpretation of the Antikythera Mechanism "is highly seductive and convincing in all of its details." It is not the last word, he concluded, "but it does provide a new standard, and a wealth of fresh data, for future research."

Historians of technology think the instrument is more complex than any known device for at least a millennium afterward. Earlier examinations of the instrument, mainly in the 1970s by Derek de Solla Price, a Yale historian who died in 1983, led to similar interpretations, but they were generally disputed or ignored.

The hand-operated mechanism, presumably used in preparing calendars for seasons of planting and harvesting and fixing religious festivals, had at least 30, possibly 37, hand-cut bronze gear-wheels, the researchers reported. An ingenious pin-and-slot device connecting two gear-wheels induced variations in the representation of lunar motions according to the Hipparchos model of the moon's elliptical orbit around Earth.

The functions of the mechanism were determined by the numbers of teeth in the gears. The 53-tooth count of certain gears, the researchers said, was "powerful confirmation of our proposed model of Hipparchos's lunar theory."

The detailed imaging revealed more than twice as many inscriptions as had been recognized from earlier examinations. Some of these appeared to relate to planetary as well as lunar motions. Perhaps, the researchers said, the mechanism also had gearings to predict the positions of known planets.

Charette noted that more than 1,000 years elapsed before instruments of such complexity are known to have re-emerged. A few artifacts and some Arabic texts suggest that simpler geared calendrical devices had existed, particularly in Baghdad, around A.D. 900.

It seems clear, Charette said, that "much of the mind-boggling technological sophistication available in some parts of the Hellenistic and Greco-Roman world was simply not transmitted further," adding, "The gear-wheel, in this case, had to be reinvented."

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