

2017

Solar Eclipses in Ancient Greece

Zach Coblens

Western Oregon University, zcoblens14@mail.wou.edu

Will Paige

Western Oregon University, wpaige13@mail.wou.edu

Ryp Ring

Western Oregon University, rring14@mail.wou.edu

Follow this and additional works at: <http://digitalcommons.wou.edu/aes>



Part of the [Astrophysics and Astronomy Commons](#), and the [Cultural History Commons](#)

Recommended Citation

Coblens, Zach; Paige, Will; and Ring, Ryp, "Solar Eclipses in Ancient Greece" (2017). *Academic Excellence Showcase Proceedings*. 80.
<http://digitalcommons.wou.edu/aes/80>

This Presentation is brought to you for free and open access by the Student Scholarship at Digital Commons@WOU. It has been accepted for inclusion in Academic Excellence Showcase Proceedings by an authorized administrator of Digital Commons@WOU. For more information, please contact digitalcommons@wou.edu.

Solar Eclipses in Ancient Greece

Zach Coblens, Will Paige, Ryp Ring | Western Oregon University



Greek Culture

Solar eclipses are known for their beauty and almost twilight feel when witnessed in person. The sun is fully engulfed by the moon, leaving only a ring of what the sun used to be for only a moment.

To the average Joe this might seem like an amazing spectacle that they can't wait to tell their grandchildren. But, there is more to this event than just a huge space rock blocking light from a star. Throughout the history of the planet many scientists and mathematicians have worked to decipher the exact timings for this event in the past and even in the future.

Antikythera Mechanism

The key to this phenomenon might just lie off the coast of Crete where in the early 1900's a fishing ship discovered what might have been the world's first analog computer. During this timeframe, the island of Crete was known as Antikythera, which was the basis behind naming it "The Antikythera Machine." What this device is believed to be is the ancient Greek's Lunar clock. It held information on each day within the Saros Cycle for position of the moon, sun and the earth on all their axis.



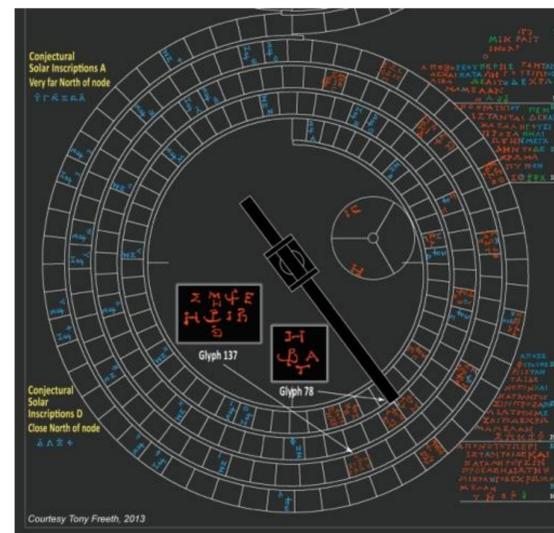
Antikythera Mechanism

Eclipses in Culture and the Saros Cycle

Greek astronomy and mythology play into the study of the sun and moon as well. It was a very cultural belief to view the sun and moon as life and death, or to relate them to the gods. Before any science was involved with a solar eclipse, many kingdoms and civilizations viewed them as a symbol. Not just one symbol was put forth upon the phenomenon of a solar eclipse. Some of the symbols included peace, declaration of war, or even a disturbance in the natural order of the world. One of the most notable solar eclipses to ever take place was the total eclipse of the sun during the war between two Greek factions, the Lydians and the Medes, in 585 BCE. The factions viewed this twilight wonderland as a sign to finally make peace and end their hatred once and for all.

Before eclipses could be predicted, Greeks observed that eclipses occurred in patterns; that is, eclipses could be predicted. Over time, through observation, they eventually came up with the Saros Cycle.

The Saros Cycle is a very accurate calculation for determining the exact time of the next full solar eclipse. This method was used primarily by Greek mathematicians to design the Antikythera Machine. What it does is follow an uncommon resonance within each of the three orbital periods of the moon to determine that a repeat eclipse will occur every 223 lunar months. This wasn't the first method in deciphering the mystery of a solar eclipse, but it was crafted from similar equations such as the 41-lunar month cycle and the 47 month lunar cycle.



Saros Dial

Ancient Greek's mathematical methods included this formula for the Saros Cycle-

$$223 P_{syn} \approx 242 P_{drac} \approx 239 P_{anom}$$

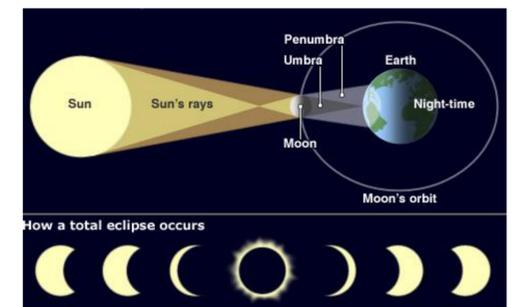
It is defined as this: A prediction cycle that is a period when a whole number of synodic months is equal to a whole number of half draconitic. When this is also close to a whole number of anomalistic months then the appearance of a repeat eclipse is very similar. Ancient Greeks stretched their equation farther than the basic 41 and 47 lunar cycles to determine a very advanced and precise prediction for each of the solar eclipses that will take place in the distant future.



Map of Antikythera

Conclusion

The sun and the moon were very symbolic in early Greek culture. Through their observations, the Greeks were able to come up with the Saros cycle to predict solar eclipses. Once they developed that, they created an analog machine that could visually show the Saros cycle. We often hear about the creativity and ingenuity of the Greeks, their observation of solar eclipses show that succinctly.



This is what an eclipse is