

Slide-notes

- 1 The total solar eclipse throughout our history. The word eclipse comes from *ekleipsis*, the ancient Greek word for being abandoned.
- 2 Seeing a total solar eclipse is so unusual. It naturally strikes fear especially to the ill informed who have no idea of the cause of such a phenomena. This, of course, triggers fearsome tales to explain it along with fearsome myths and omens that result from such an event.
- 3 In Vietnam, people believed that a solar eclipse was caused by a giant frog devouring the Sun, while Norse cultures blamed wolves for eating the Sun.

The flying black dog, Tiangou, of Chinese legend is responsible for eating the sun during a solar eclipse because some dogs eat anything. The story goes that [Zhang Xian](#), god of birth, fires arrows at Tiangou to ward him off. Eventually Tiangou gets scared and throws up the sun like an old tennis ball. And our star is safe and a little slobbery.

According to ancient Hindu mythology, the deity *Rahu* is beheaded by the gods for capturing and drinking *Amrita*, the gods' nectar. Rahu's head flies off into the sky and swallows the Sun causing an eclipse.

The Pomo, an indigenous group of people who live in the northwestern [United States](#), tell a story of a bear who started a fight with the Sun and took a bite out of it. In fact, the Pomo name for a solar eclipse is *Sun got bit by a bear*.

- 4 In China, solar eclipses were thought to be associated with the health and success of the emperor, and failing to predict one meant putting him in danger. Legend has it that 2 astrologers, Hsi and Ho, were executed for failing to predict a solar eclipse. Historians and astronomers believe that the

eclipse that they failed to forecast occurred on October 22, 2134 BCE, which would make it the oldest solar eclipse ever recorded in human history.

Clay tablets found at ancient archaeological sites show that the Babylonians not only recorded eclipses—the earliest known Babylonian record is of the eclipse that took place on May 3, 1375 BCE—but were also fairly accurate in predicting them. They were the first people to use the saros cycle to predict eclipses. The saros cycle relates to the lunar cycle and is about 6,585.3 days (18 years, 11 days, and 8 hours) long.

The Babylonians believed that solar eclipses were bad omens for kings and rulers. Predicting solar eclipses enabled them to seat substitute kings during solar eclipses with the hope that these temporary kings would face the anger of the Gods, instead of the real king.

Fear of solar eclipses still exists today. Many people around the world still see eclipses as evil omens that bring death, destruction, and disasters.

A popular misconception is that solar eclipses can be a danger to pregnant women and their unborn children. In many cultures, young children and pregnant women are asked to stay indoors during a solar eclipse.

In many parts of [India](#), people fast during a solar eclipse due to the belief that any food cooked while an eclipse happens will be poisonous and unpure.

- 5 According to "A History of Astronomy" by A. Pannekoek, the result obtained by Hipparchus was **between 62 and 73 Earth radii**. Today we know the average distance is about 60 radii, varying by a few Earth radii either way because of the ellipticity of the Moon's orbit.

In the absence of accurate timing, the method is almost

guaranteed to produce an overestimate.

6 Discovery of Helium

In 1868, Janssen traveled to Guntur, India, to observe the solar eclipse. He focused on the solar prominences and concluded they mostly comprise hydrogen gas, heated to extremely high temperatures. But on August 18, when he observed the sun's spectrum through his spectroscope, he noticed that the wavelength of the yellow line supposedly indicating the presence of sodium didn't actually match up to the wavelength for that element. In fact, it didn't match the wavelength of any known element to date. The line was bright enough, he thought, that it should be visible even without the aid of an eclipse, provided a means could be found to filter out all but that wavelength of visible light. That is how he came to invent the spectrohelioscope to better analyze the sun's spectrum.

Some 5,000 miles away, on October 20, 1868, the English astronomer Joseph Norman Lockyer also succeeded in observing the solar prominences in broad daylight. His paper detailing those observations arrived at the French Academy of Sciences on the same day as Janssen's paper, so both men received credit for the discovery of helium.

7 Confirmation of relativity

The British astronomer and mathematician, Sir Arthur Eddington, used the [total solar eclipse of May 29, 1919](#) to test Albert Einstein's theory of general relativity.

By taking pictures of stars near the Sun during totality, Eddington was able to show that gravity can bend light.

8 August 2, 1133

King Henry's Eclipse: King Henry I died shortly after the eclipse, prompting the spread of the superstition that eclipses are bad omens for rulers.

May 15, 1836

English astronomer Francis Baily first discovered and

described Baily's beads—a phenomenon that occurs in the seconds before and after totality in a total solar eclipse and annularity in annular solar eclipse.

July 28, 1851

The first photograph of the Sun's corona was taken by a Prussian photographer Berkowski,