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Cultural Beliefs Regarding Solar Eclipses

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Important Total Solar Eclipses in History

Introduction

Eclipses have been an important part of history and at times have had immense impacts on human societies. Noted throughout literature and science, these events have been cited with a range of outcomes from ending wars, to marking the death or birth of historically prominent people, to greater gains in scientific knowledge. There are three main types of solar eclipse: partial, annular, and total. A partial eclipse occurs when only part of the Sun is blocked by the Moon. An annular eclipse occurs when the Moon’s shadow is directly over the Earth, but the Moon is slightly farther from Earth. Because it appears smaller, a thin ring of the Sun remains visible around the Moon. In a total eclipse, the Moon blocks the Sun perfectly, casting a shadow onto Earth. Areas that fall within this shadow will experience complete darkness for seconds or minutes due to the eclipse. This poster presents only the most famous total solar eclipses and what they were known for.

Battles, War, & Peace

The Assyrian Eclipse June 15, 762 BCE

The Assyrian Empire, which occupied what is now modern day Iraq, records a solar eclipse in the same passage as the Assyrian inscription (Ashur is now known as Oal elShergh). The linking of these two events in the passage implies that the people of that time linked the events together as inter-related.

This event from c. 2,700 BCE is regarded as one of the earliest Near East recordings. This solar eclipse is known in both the Assyrian texts as well as the Book of Amos in the Hebrew Bible, and has provided scholars with an invaluable chronological reference point between the texts.

The Siège of Larissa May 19, 556 BCE

Not much is known about this battle where the Persians siege Larissa beyond a single sentence, “A cloud, however, covered the sun and it from sight until the inhabitants abandoned their city, and thus it was taken.” (Xenophon, Anabasis)

Literature

Homer’s The Odyssey April 16, 1177 BCE

There is some evidence to suggest that Odyssey, from Homer’s Odyssey, could have returned to his wife Penelope on the day of an eclipse. The story does not specifically mention an eclipse, but there are omens and a poetic description of a total solar eclipse at the end of the story where the seer, Thoctomus, foretells Penelope’s suitors deaths. He ends his prediction with the sentence, “The Sun has been obliterated from the sky, and an unlucky darkness invades.”

Archilochus’ Eclipse April 6, 647 BCE

Archilochus (6th century BCE) wrote his poem “Nothing can be surprising any more or impossible or miraculous, now that Zeus, father of the Olympians, has made night out of noonday, hiding the bright sunlight, and fear has come upon mankind. After this, man can believe anything, expect anything.”

Shakespeare Nov. 2, 1572 & Dec. 12, 1605 CE

Shakespeare’s plays reference eclipses on several occasions, most notably in Macbeth and King Lear, in which Shakespeare wrote, “These late eclipses of the Sun and Moon portend no good to us.” It is believed Shakespeare could have witnessed a couple solar eclipses in his lifetime. The first being Nov. 2nd, 1672 (the month he would be 8 years old at the time). This eclipse was called the Great Star of 1572, and is now known as Tycho’s Supernova. The second time would be the total eclipse of Oct. 12, 1605, which would have been visible from England, following a partial lunar eclipse visible from the British Isles two weeks earlier.

Prominent People in History

Crucification of Jesus Disputed

A controversial eclipse, the one referenced in the Christian Bible during Jesus’ crucifixion is hotly debated. There were in fact two solar eclipses during this time that would have passed over the Holy Lands. One on Nov. 24, 29 CE and the other on March 19, 33 CE. However, the Bible notes that Jesus was on trial and crucified around Passover. The Passion occurs at the full moon – when a solar eclipse cannot physically happen. Solar eclipses can only happen during the new phase. Therefore, it is generally believed that a partial lunar eclipse, which would meet the required criteria, could have eclipsed the Sun and the moon due to God’s command on April 3, 33 CE.

Mohammad Nov. 24, 569 CE

The founder of Islam, the prophet Muhammad, was born in Mecca in the Year of the Elephant, directly after a solar eclipse. His birth year got its name from an incident by the Abyssinians, who used eclipses in the assault.

In ancient times births and deaths of leaders were correlated to celestial omens. However, Islamic theology does not accept that the eclipse was sent by God as an omen of the prophet’s birth, a doctrine that is based on another solar eclipse closely tied to Muhammad.

His infant son Ibrahim died tragically on January 27, 632 CE. An annular eclipse happened the same day “and rumors of God’s personal concern quickly arose.” (Prayers of Muhammad). Muhammad, though, said the sun and the moon do not suffer eclipse for anyone’s death or life.” (Hadith)

Emperor Louis’ Eclipse (Treaty of Verdun) May 5, 840 CE

Louis of Bavaria, also known as Louis the Pious, was the son of Charlemagne and held the titles of King of the Franks, Holy Roman Emperor, and King of Aquitaine. It is said he was so terrified after witnessing a solar eclipse that he died, though there was a time span between the eclipse of May 5 and his death the following month (he died on 20 June, 840 CE). After his death his three sons fought over who was to succeed to the throne and ultimately the kingdom was broken up into three parts (France, Germany, and Italy) by the Treaty of Verdun, three years later.

In the third year of the Indiction, the Sun was hidden from this world and stars appeared in the sky as if it were midnight, on the third day before the Nones of May (May 5) during the Liturns of Our Lord” (Andreas Bergamoli, Chronicon).

Fun Facts

The Greek astronomer Hipparchus used a solar eclipse to determine that the Moon was about 429,000 km (268,000 mi) away from the Earth. This is about only 11% more than what today’s scientists accept as the average distance between the Moon and the Earth.

Sir Edmund Halley (Halley’s Comet), calculated the May 3, 1715 total solar eclipse to within 4 minutes and about 18 miles (30 km) of the actual eclipse timing and path.

The first photograph of the Sun’s corona was taken by Austrian photographer Berlinger on July 28, 1851.

On July 18, 1860 the first east west plate photograph was taken of an eclipse.

Solar Eclipse Eye Safety

NEVER look directly at the Sun except when the solar eclipse is at its totality and the Sun is completely covered!!! Looking directly at the Sun at any other time can cause permanent eye damage and even blindness, EVEN THOUGH YOU DO NOT FEEL IT!!!

Science

Corona Discovery Process Dec. 22, 968 to July 8, 1924 CE

Corona is Latin for crown, which was derived from the ancient Greek korinon (which meant garland or wreath). Used in the context of the Sun and other stars it is an aura of plasma that extends into the interplanetary space. The Sun’s corona is only visible during a total eclipse, with the naked eye except during a total solar eclipse, or with the use of a coronagraph.

Dec. 22, 968: The first clear description of the corona is recorded.

Oct. 12, 1605: Johannes Kepler of Germany is the first to write a scientific comment on the corona. His hypothesis was that it was light reflected from matter around the Sun, though it is said he never actually saw a total eclipse himself. His hypothesis was based on reports of eclipses: most notably the one in 1605.

May 22, 1724: Jose Joaquin de Ferrari of Spain gave the name corona to the glow of the faint outer atmosphere of the Sun, seen during a total eclipse. He proposed that the corona must belong to the Sun, not the Moon, because of its size.

Jul. 8, 1842: Francis Balley of the United Kingdom identified the corona and prominences as part of the Sun’s atmosphere.

King of Slam’s Eclipse (Helium) Aug. 18, 1868 CE

Helium is the second lightest and second most abundant element known to man, yet this noble gas was not discovered until the 1800’s – thanks to a solar eclipse. French astronomer Jules Janssen had a newly invented spectrograph and used it to view the total solar eclipse over India on Aug. 18, 1868. What he saw was an unusual spectral signature that was only visible during the eclipses. During the same eclipse, J. Norman Lockyer (an English scientist), identified a yellow spectral line in the Sun’s corona and also recognized it as an unknown element’s signature. Both have been credited with discovering the gaseous nature of the solar chromosphere and the discovery of helium, which was named after the Greek word for Sun: Helios.

Einstein’s Theory of Relativity May 29, 1919 CE

In 1919 eclipse expeditions, led by British astronomer and mathematician Sir Arthur Eddington, were sent to two small islands; Sobral, off the northeast coast of Brazil, and Principe, in the Gulf of Guinea. About a dozen stars were studied during the total solar eclipse that occurred on May 29th of that year, with results that supported Einstein’s predictions. It was to become one of the most important scientific discoveries of the 20th century.

Einstein’s theory was that light is affected by gravity in the same way that matter is affected by gravity; fundamentally saying that the gravity of the sun should bend light in the way that is now called gravitational deflection. Basically, should the experiments work (which they did), the Sun’s gravity should move the apparent position of stars, so that they seem to be located lower than the other time when they do not appear close to the Sun. Therefore, light coming from a distant star should be bent a little bit by the Sun’s gravity, so the light path will vary closer to the Sun the further into its course. The Figure 1 depicts this deflection.

Figure 1

![Figure 1](https://www.nasa.gov/mission_pages/sunearth/news/solar-eclipse-history.html)