



ANCIENT EGYPTIAN ASTRONOMY AND ASTROLOGY

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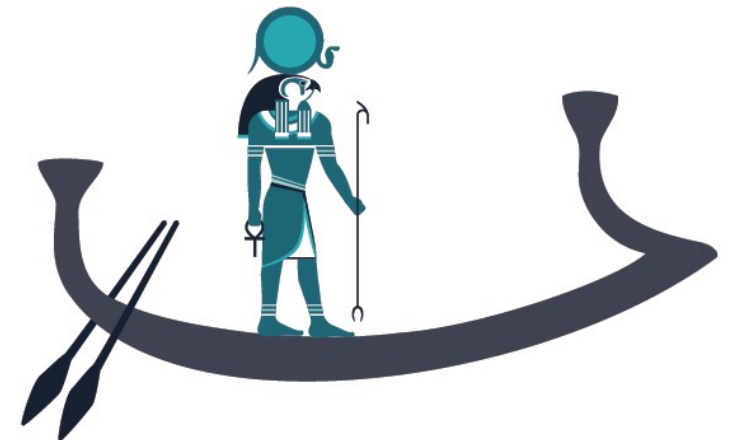
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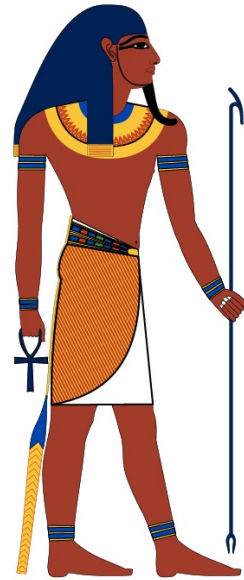
Introduction: Brief description of Historic Facts of Egypt

- invented a calendar that consisted of 365 days based on astronomical observation about five thousand years ago
- calculated the period of a well-known variable star called Algol, thousands of years before Europeans
- tools for carrying out astronomical measurements — the sundial, clepsydras, and the merchet
- The Egyptian pyramids were carefully aligned towards the pole star, [“Egyptian Astronomy - History of Astronomy.”] and the temple of Amun-Re at Karnak was aligned on the rising of the midwinter Sun

What was the importance of the sun?

- sun god: Ra -> demure creator god, central ideology of kinship and 'father of every pharaoh'
- "RA" = sun, day
- Sun/Ra representer of life, warmth and creation
- Ra was creator of life and gods -> principal god
- It was believed that Ra was sailing across the sky during the day and sailing to the underworld by night





The four stages of Ra during the day

1. Morning: Scarab beetle or khepri -> symbol of birth and creation
2. Midday: man with falcon head wearing sun disk and cobra
3. Afternoon: Atum-> shapeshift to different god (creator of universe)
4. Night: Apep or Apep (cat) -> battle with serpent

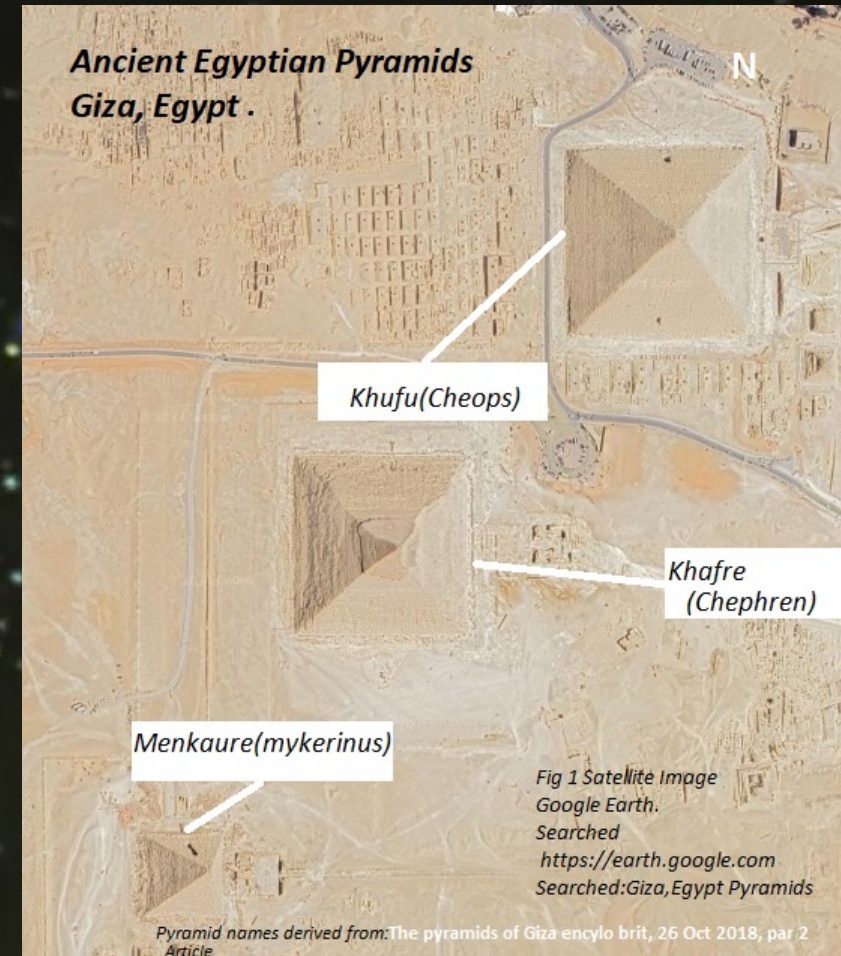
The debate behind the pyramids alignment with Orion's belt of the sky



Some say the three stars are believed to represent the three pyramids that were built in Giza, but there is still some arguments of what the true meaning behind them other than royal tombs for pharaohs(The pyramids of Giza encylo brit, 26 Oct 2018, para 2).



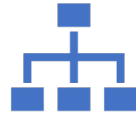
And supposedly it's a journey of their Ka(souls) to heaven, or the creation of life. Maybe it just represents rays of light traveling through space for Egyptians to observe(What do the pyramids of Giza encylo brit represent, 26 Oct 2018, para 1).



Where were ancient star charts found?



Drawings found inside nobility coffin lids showed painted hieroglyphs of specific tables of stars and specific star movements. Eg Sirius-year round (Symons, Tasker, 2015, Para 3).



Main sources of star chart tables are mostly discovered inside tombs except one. (Symons, Tasker, 2015, Para 4).



Time period of discovery 2100 B.C.



(Symons, Tasker, 2015, Para 4).



3900 year old secret chamber housing Egyptian tomb with exquisite detail unearthed retrieved from <https://3900-year-old-secret-chamber-Egyptian-tomb/>

What are Star Clocks?

- Originally it was believed that it was used to track the night sky and have ceremonial significance from past scholars(Gorman,2015, para 2).
- Presently new insight has brought to light a new theory that it guides the dead through the night sky to be a star (Gorman, 2015,para 2).

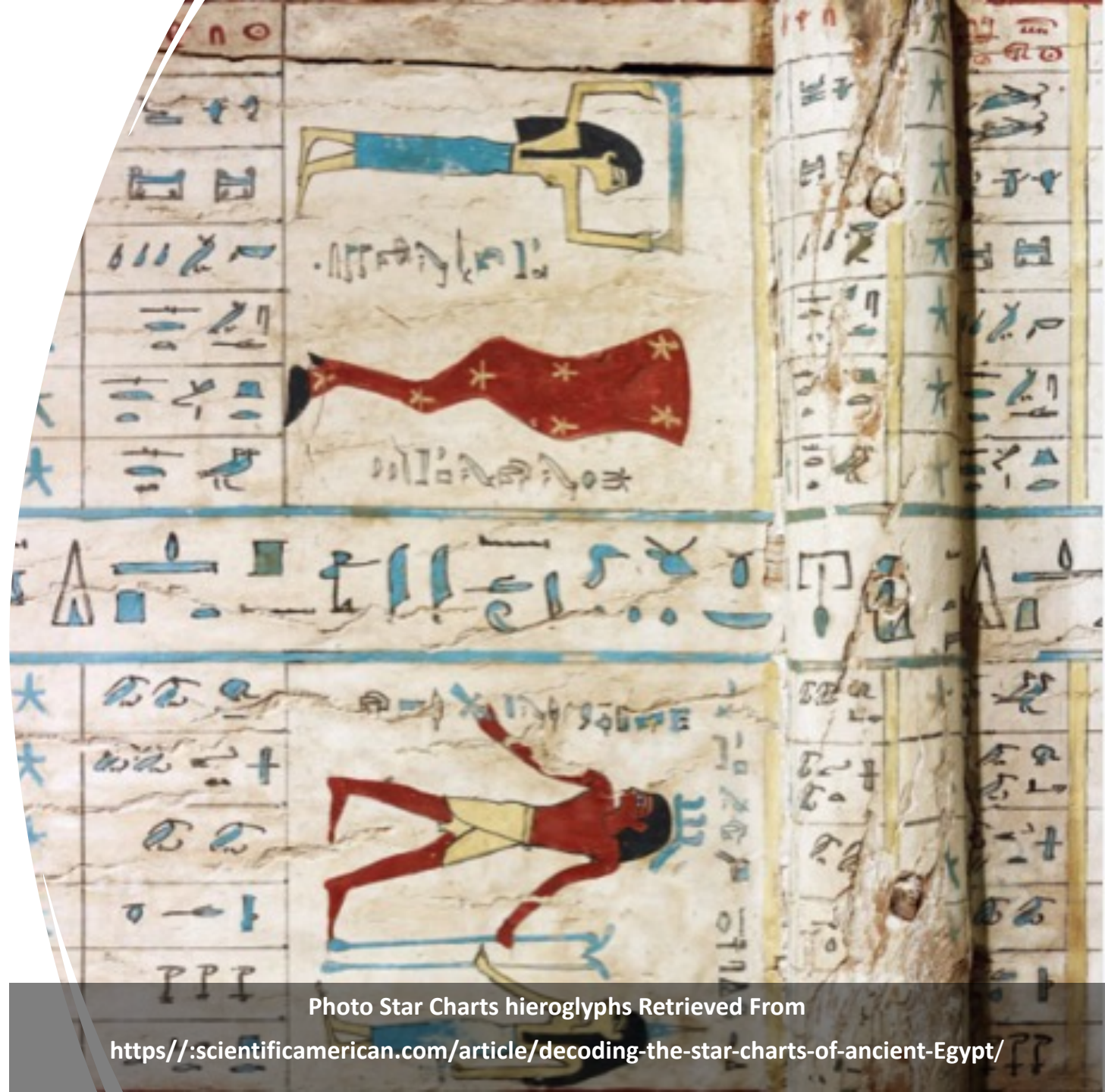


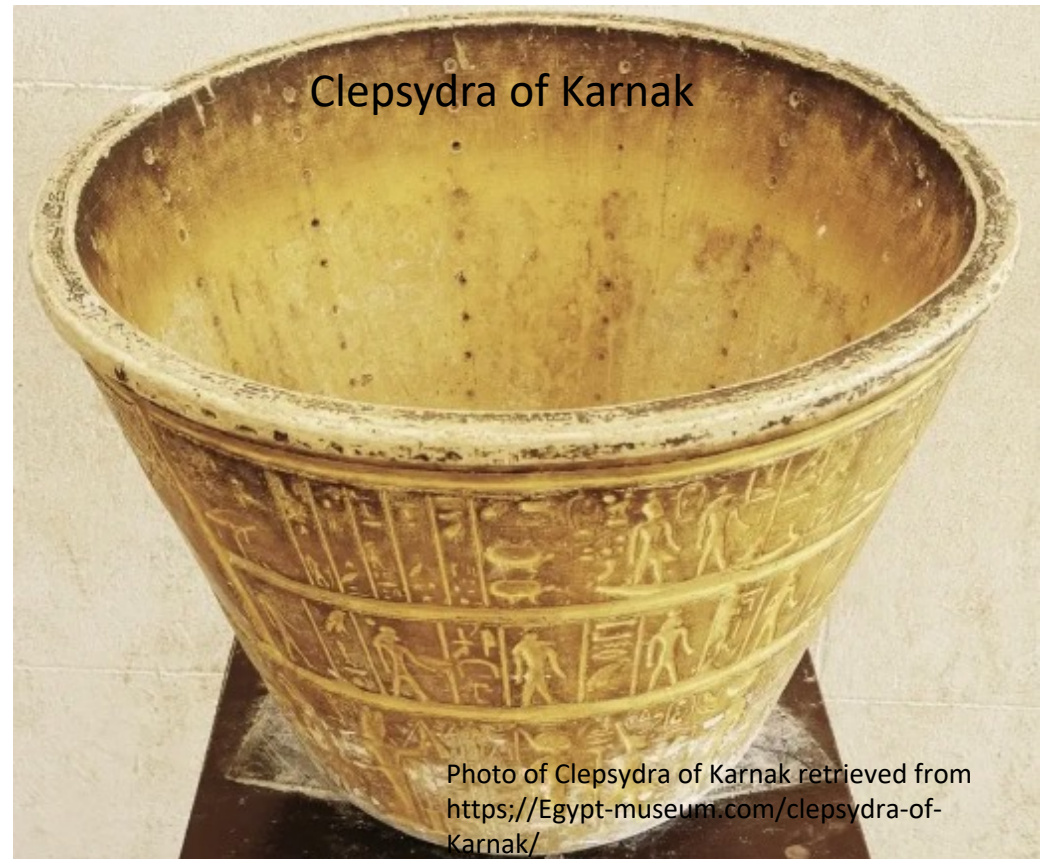
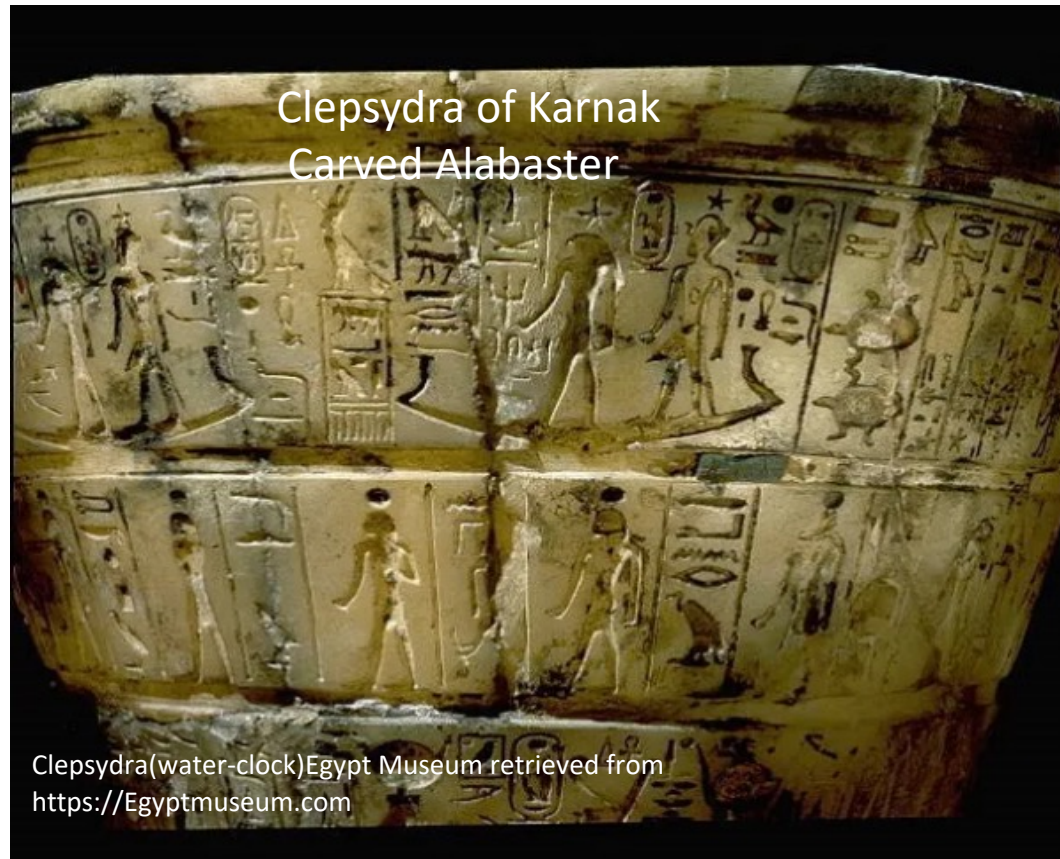
Photo Star Charts hieroglyphs Retrieved From

<https://scientificamerican.com/article/decoding-the-star-charts-of-ancient-Egypt/>

Water Clock: How does it work and was it for?

- The Clepsydra bowl was a primitive measuring tool for tracking the 12 hours of night(Schomberg para 1-6).
- On the outside are meaningful symbols of planets, stars and constellations of the northern sky, and each month represented a different god(Schomberg para 1-6).

- As you looked Inside the bowl you measured the closest false hole in relation with the water level. In total there were 12 columns and 11 false holes(Schomberg para 1-6).
- Each row represented one hour which drained through the bottom(Schomberg para 1-6).



How does a merkhet work and what was its purpose?



Another measuring device for time keeping, and was used as a surveying tool (Science museum Group carter para 1-2).



It was used in daylight to track the 12 hours of sunlight (Science museum Group carter para 1-2).



At night it was an astronomical tool for priests to track stars by aligning with the north star (Science museum Group carter para 1-2).



To track star movements in the night sky a second merkhet was used to establish an alignment of north/south meridian by creating a reference point. (Ancient Technology 2014).

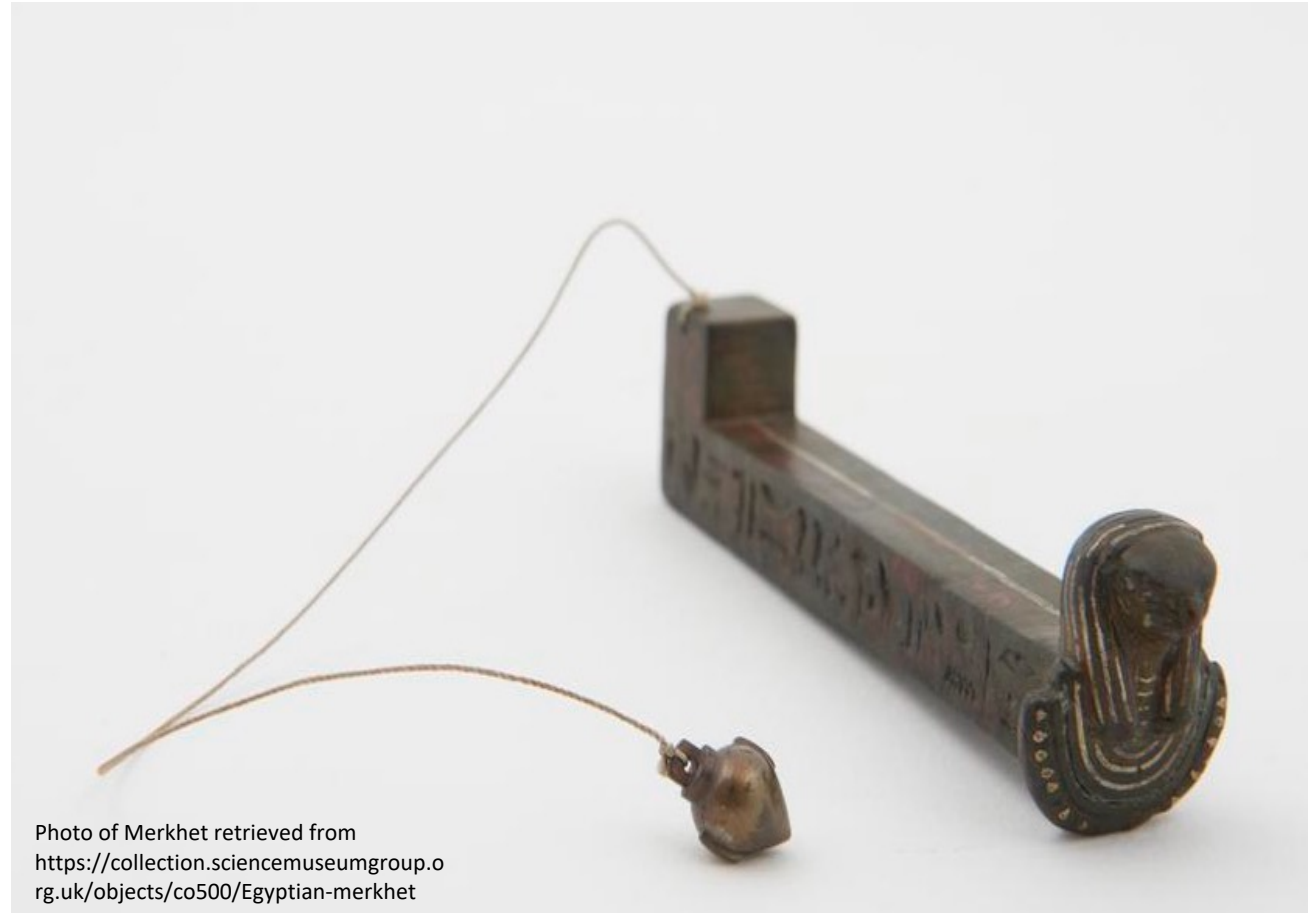
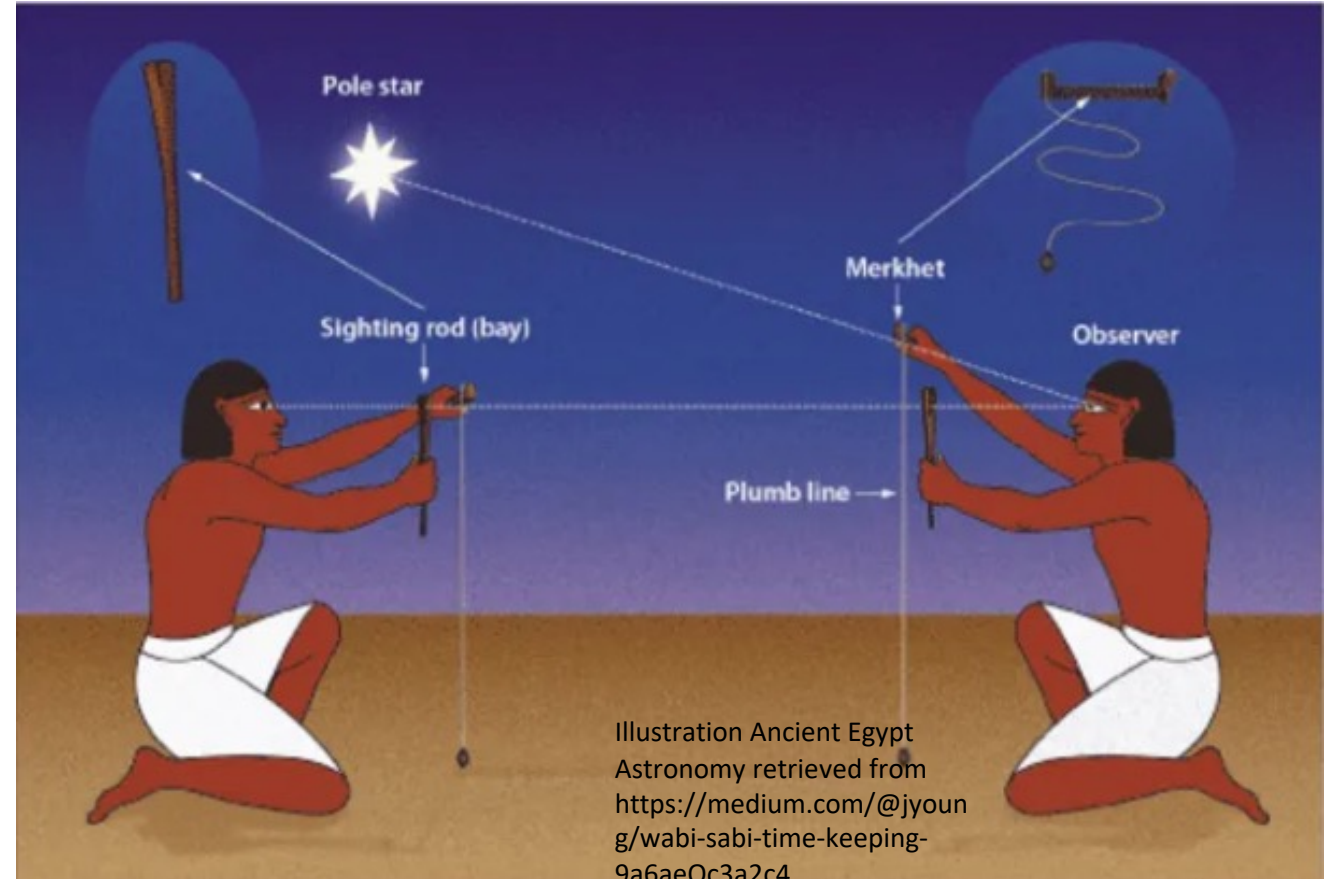
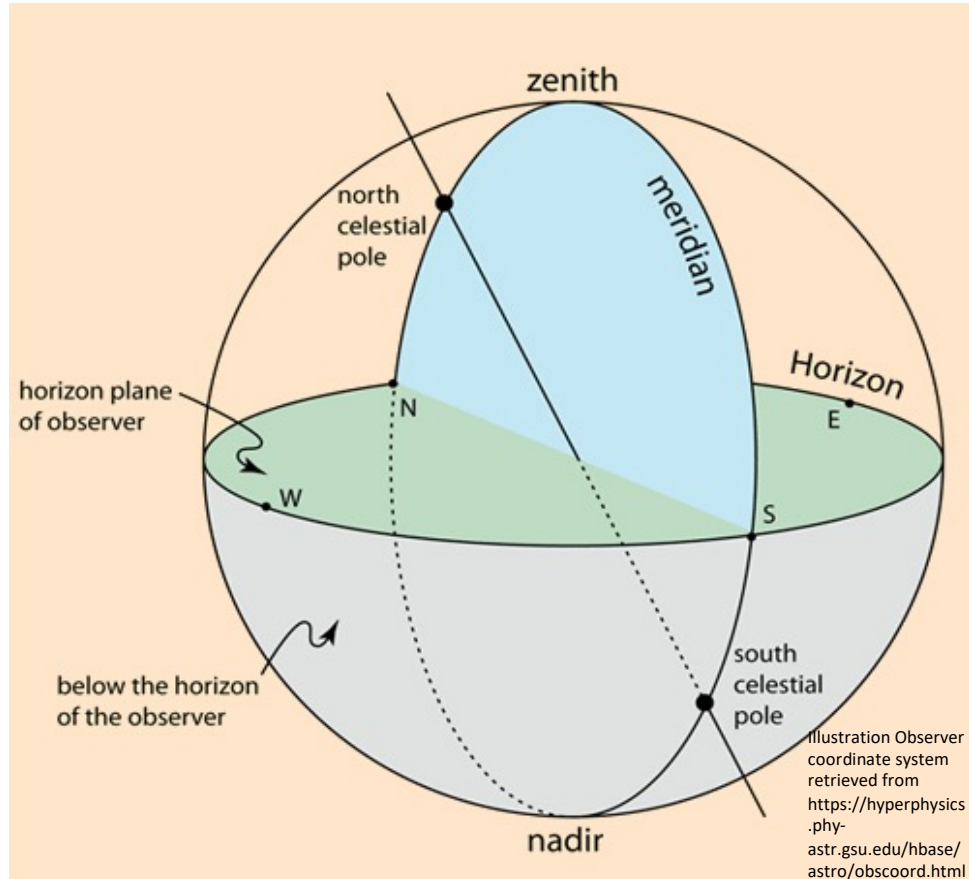


Photo of Merkhet retrieved from <https://collection.sciencemuseumgroup.org.uk/objects/co500/Egyptian-merkhet>

The merkhet plumbline is lined up with the North star, and by using a baystick(small slit Y-shaped) to align with the other merkhet plumbline it lined up with the north south meridian. Time could be measured at night by stars crossing the meridian throughout the night sky(Youn 2013 para 1-3).



What was the sundial used for?

Ostrakon- A sundial of a flat piece of limestone with 12 sections at 15 degrees apart which measured the 12 hours of sunlight(Bryner 2013 para 1-4).

The hole at the top was the place of a wooden peg would be placed to cast a shadow that would tell the hourly time (Bryner 2013 para 1-4).



(courtesy University of Basel, Egyptology) Photo retrieved from <https://archaeology.org/issues/July-august-2013/artifacts/egypt-limestone-sundial-valley-kings/>

The temple of “Hathor” in Dandara

- Temple of Hathor is one of the most well-preserved antiquity sites in Egypt today, and is an excellent example of traditional Pharaonic architecture. The Temple of Hathor was built primarily during the Ptolemaic Dynasty, which was a period of Greek rule in Egypt
- decorations also include various feast calendars, the famous circular Zodiac in the ceiling of a small chapel (a replica, the original now being in the Louvre Museum in Paris) and a second Zodiac on the ceiling of the hypostyle hall.
- Zodiacs represent an important astronomical feature of the temple of Dandara. Recent studies suggest that they were maps of the heavens showing stars, asterisms and constellations belonging to the different astronomical traditions existing in Ptolemaic Egypt
- The temple originally housed the famous Zodiac of Dendera. This bas-relief with human and animal figures represented a night skyscape, and was found on the ceiling of a chapel in the Temple of Hathor, where the mysteries of the resurrection of the god Osiris were celebrated. Egyptologists determined it should be interpreted as a map of the sky rather than a giant horoscope or a perpetual astrological tool.
- location of Dandara was carefully selected to combine astronomical and topographic orientations reinforcing the cosmic symbolism of the whole landscape
- best preserved of all ancient Egyptian temples

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Important things to remember



Calendar: The Egyptians developed a calendar system that was close to the one we use today, with 365 days divided into 12 months of 30 days each.



Predicting the Nile: The Egyptians used their observations of the sky to predict and prepare for the flooding of the Nile River.



Fixing festival dates: The Egyptians used astronomy to fix the dates of festivals.



Determining the hours of the night: The Egyptians used astronomy to determine the hours of the night.



Horoscopes: The Egyptians produced horoscopes to determine the fate of a life or event.



Pyramid alignment: The Egyptians aligned their pyramids and temples toward the north because they believed their pharaohs became stars in the northern sky after they died.



Observatory: Archaeologists discovered the ruins of an ancient Egyptian observatory that included a sundial, inscriptions, and artifacts.



Thank you for listening



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Background star chart

photo retrieved by Scientificamerican.com/article/decoding-the-star-charts-of-ancient-Egypt/

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Fig 1a Clepsyra of Karnak photo retrieved from <https://Egypt-museum.com/clepsydras-of-Karnak/>

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Clepsydra(water-clock)Egypt Museum retrieved from <https://Egyptmuseum.com>

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Fig () Photo of Merkhhet retrieved from <https://collection.sciencemuseumgroup.org.uk/objects/co500/Egyptian-merkhhet>

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Topview

Fig 1 Giza Pyramids retrieved by google earth

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Slide 10 Background Picture Orion belt . Retrieved by <https://www.skvatnightmagazine.com/advice/skills/orion-constellation-best-targets-observe>

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