

Planets Rahu and Ketu ended the last ice age

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Summary

Twenty thousand years ago, at the greatest extent of the ice age, a blizzard of comets entered the Solar System, circled the Sun, and returned to their origin.

They came from the **Inner Oort Cloud**, a thin disk packed with trillions of comets that remained after formation of the Solar System. This disc of comets, hollow in the center like a 45-rpm record, lies in the same plane as Earth's orbit; it extends outward to a thick shell of sparsely-spaced comets called the **Outer Oort Cloud**.

The comet barrage originated from a single point 6940 au from the Sun, where the constellation of **Hydra the Sea Serpent** crosses the celestial equator at 9:30 hours. Through this point passed a large planet that stirred up the comets. Hindu mythology names this planet **Vasuki** meaning 'open-mouthed serpent', the same name as the constellation.

Hindu mythology calls comets 'gods' and planets 'demons', while the supreme being responsible for preserving life is **Vishnu**. During the comet barrage, the Sun managed to capture a demon lurking among the gods, and thus gained immortality. Named **Svarbhanu**, this newly immortal demon orbited Sun in a 16-year retrograde orbit in the same plane as Earth.

Alarmed that a demon had become immortal, Vishnu assigned his only female avatar, planet **Mohini**, to stop the demon. Mohini was well equipped for the task. She had three times the mass of Earth, a circular orbit of four years, and seven large moons to impale the intruder. Mohini struck the passing demon with a small moon, which should have caused the demon to explode. Instead, the impact only severed the head

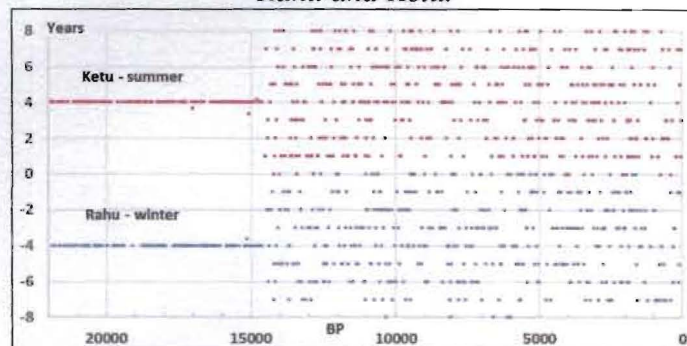
Rahu from the body **Ketu**. The body Ketu continued on while the head Rahu was captured by Mohini for two full revolutions before she released it.

Both smaller demons followed the original orbit, spaced eight years apart, surrounded by a cloud of debris from the split that gave them comet-like tails. They passed Earth on the Sun side - Rahu in winter, Ketu in summer - so close that they eclipsed the Sun. At each passage, debris would strike Earth, fill the sky with shooting stars, and leave a spike of ammonium in Greenland ice cores. Impacts ablated the ice sheets and caused sea level to rise, thus ending the ice age.

After five millennia, both planets disappeared. What happened?

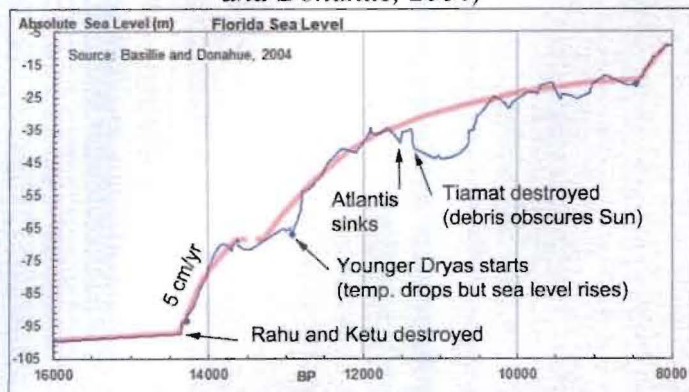
They had passed too close to Jupiter, who kibbled them into fragments. These fragments now continued along the same orbit, but strung out in a chain. Instead of impacting Earth every eight years, the remnants bombarded Earth every year with more and bigger pieces (Figure 1). Some spikes of ammonium were the largest ever recorded in the ice cores.

Figure 1: Deviation of strikes from 16-year period. Each point represents a strike in GISP2 ice core from Rahu and Ketu.



Constant bombardment caused sea level to rise 5 cm a year for 500 years, pause, then continue for another 1000 years (Figure 2). Ice that had accumulated during the previous 100,000 years largely disappeared.

Figure 2: Rise of sea level after 14.4 ka BP. (Balsillie and Donahue, 2004)



What ended the ice age was not an increase in temperature, orbital inclination, or any other mechanical change, but primarily incessant bombardment by remnants of two planets.

Hindu astrology kept their memory alive by calling them ghost planets, able to influence the human condition. Their rediscovery is central to a new theory on the origin and cyclicity of ice ages.

Background - Hindu origin of Rahu and Ketu

(Based largely on material compiled by Prash Trivedi, 1996)

In the Hindu creation myth, intrusive comets were called **Devas** meaning 'gods' while intrusive planets were called **Asuras** meaning 'demons'.

In the beginning, an entity called **Vasuki** 'the great serpent' or 'open-mouthed serpent' stirs up the celestial ocean and causes a barrage of comets and planetoids to enter the Solar System, swing round the Sun, then vanish back into the cosmos. The barrage lasted a thousand years.

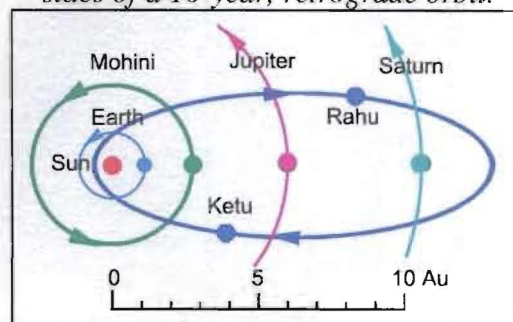
Quite unexpectedly, a demon named **Svarbhanu** is deflected into a 16-year, retrograde orbit around the Sun. Alarmed that a demon has gained immortality, **Sun** and **Moon** advise **Vishnu** about this calamitous event. Vishnu assigns **Mohini**, his only female avatar, to stop **Svarbhanu**.

Mohini was well equipped for the task. Babylonian mythology calls her **Tiamat**, with three times the mass of Earth, a circular orbit of four years, and seven large moons to impale the intruder.

After Svarbhanu orbited a few times, Mohini struck Svarbhanu with a small moon. To her dismay, instead of blowing up the demon, the moon cleaved Svarbhanu into three pieces like a knife: the smallest piece veered off and struck Earth, the middle piece became the demon **Rahu** 'the head', while the largest piece became the demon **Ketu** 'the body'. While Ketu continued on, Mohini captured Rahu for two orbits totaling 8 years, then released it to follow Ketu.

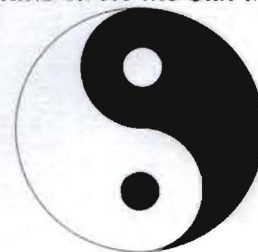
After cleavage, the two immortal demons orbited the Sun on chariots pulled by eight black horses and eight dusky horses. Each demon carried spears to throw at Earth, and each was about the diameter of Moon. Rahu the head eclipsed the Sun in mid-winter while Ketu the body eclipsed Earth's moon in mid-summer. Rahu approached from the direction of Leo the Lion, while Ketu approached from Aries the Goat (Figure 3).

Figure 3: The demon pair circle the Sun on opposite sides of a 16-year, retrograde orbit.



As a result of Mohini's cleavage, each planet hosted a cloud of satellites and a tail of debris. The Yin-yang symbol represents these twin planets, each with a comet-like tail, circling on opposite sides of the Sun (Figure 4).

Figure 4: Yin-yang symbol: a pair of planets with comet-like tails circle the Sun in opposition.



Their orbital period of 16 years was constrained by Jupiter, which had an orbital period of 12 years at a time when Earth had an orbital period of 358 days. At nearly every passage, Earth would intercept a satellite,

and some luckless region of Earth would be incinerated.

After a long time, the twin planets mysteriously disappeared. Hindu astrology preserved their memory as ghost planets of negative aspect, still able to influence the human condition.

Based on an increase of ammonium spikes in ice cores, their disappearance occurred around 14,860 BP, when a near collision with Jupiter fragmented both planets into rubble. These pieces continued to circle Sun in a 16-year orbit but spread out into a long, invisible chain. For eight summers in a row, then eight winters in a row, Earth would pass through the rubble and get pounded. These incessant strikes eventually vaporized much of the ice accumulated during the previous 100,000 years.

Discovery of Rahu and Ketu

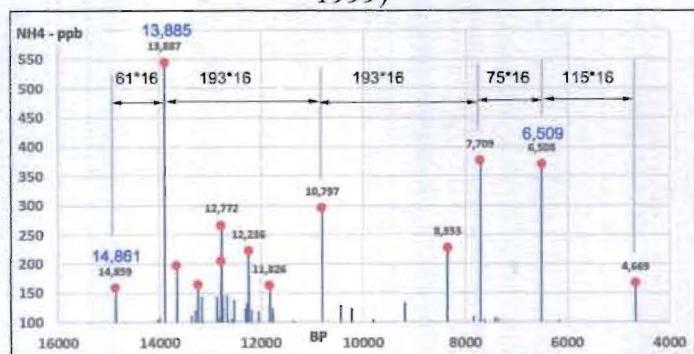
Ammonium in ice cores

Mike Baillie of Belfast University discovered that passage of a cosmic body through the atmosphere generates a spike of ammonium. The larger the body, the greater the spike. In the northern hemisphere, snow in Greenland precipitates this ammonium, which lies preserved in layers of ice (Baillie, 2007).

While working on the start date of the Mayan calendar, Baillie (2012) noticed a certain regularity to the largest strikes in GISP2, but the exact nature eluded him. Baillie was correct; the peaks have a 16-year cycle (Fig. 5).

Figure 5: Repeated spikes of NH₄ in GISP2.

Between 15 ka and 4 ka BP, the largest impacts occurred at increments of 16 years. (Mayewski et al., 1999)



A closer look reveals not only big strikes but thousands of small strikes with the same period.

Hindu mythology supplied a narrative for this repetition.

16-year period of strikes

Beginning in 20,000 BP, strikes from both planets occurred at regular 16-year intervals (Figure 1). Each little dot represents a strike, blue for Rahu in the winter and red for Ketu in the summer eight years later.

Both planets passed Earth on the Sun side, about half the distance to Moon, a stable configuration (Patton and Windsor, 1996).

Each planet could eclipse the Sun and Moon. This makes the minimum diameter for Rahu to be 1700 km, while Ketu would be larger.

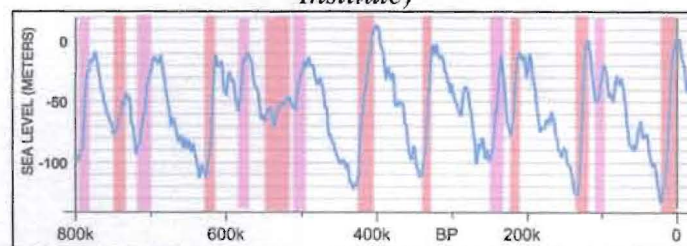
Destruction by another planet

Around 14,861 BP, a catastrophe turned both planets into rubble (Fig. 1). Remnants of the stricken planets continued along in about the same orbit, but organized in a long chain. Instead of passing Earth every eight years, fragments began to strike Earth in successive years. On average, the number of strikes tripled.

Comet barrage in 20,300 BP

A companion paper (Harris, 2022) proposes that comet barrages are cyclical. Each barrage ends an ice age, measured by an abrupt rise in sea level (Figure 6).

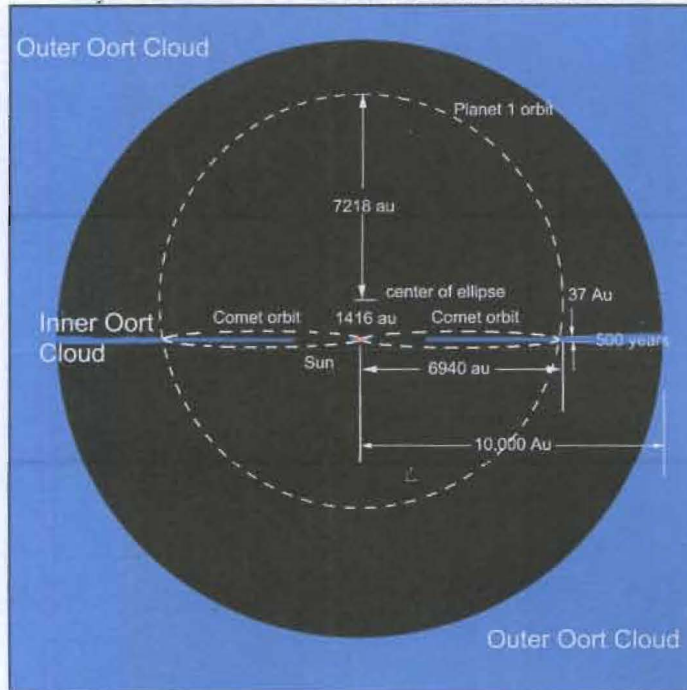
Figure 6: Absolute sea level for the last 800,000 years. Periodic comet barrages generated by two planets in the Inner Oort Cloud indirectly ended every ice age. Color bars are rapid rise in sea level (2° Institute)



These comets originate in the Inner Oort Cloud (Figure 7). Periodic barrages can be modeled by two large planets that plow through the Inner Oort Cloud on a regular basis. Their orbits are synchronized with the orbits of returning comets, so that the number of

comets increases with time. Two planets suffice to end every ice age for the last 800,000 years.

Figure 7: Twice each revolution, Planet 1 disturbs comets and planetoids in the flat disk of the Inner Oort Cloud. The offset of the planet provides a synchronous orbit with the comet clusters.



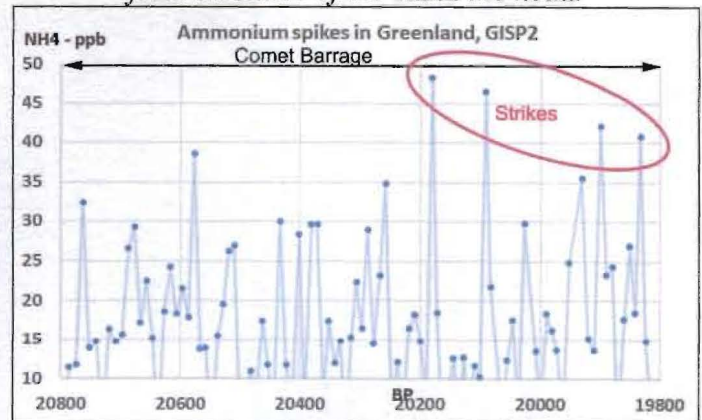
Planets captured around 20,300 BP

The comet barrage lasted for a thousand years, from 20,800 to 19,800 BP.

Around 20,800 BP, the Sun captured Svarbhanu, and shortly thereafter, Mohini cleaved it in two. A third piece struck the southern hemisphere, where it left a big spike of ammonium in Taylor Dome ice core in 20,768 BP (Mayewski, 1996).

The initial orbit was oblique to the plane of Earth, but under the influence of Jupiter, the orbit settled down. Six hundred years later came four large strikes (Figure 8). Ice sheets began to recede and sea level to rise.

Figure 8: Large strikes began in 20,180 BP. The first was from satellites of the Ketu the body, the next three from satellites of the Rahu the head.



Magnitude and frequency of strikes after breakup

For five millennia, occasional strikes caused sea level to slowly rise. This changed in 14,859 BP when both magnitude and frequency of ammonium spikes increased significantly (Figures 9 and 10). In response, sea level began to rise rapidly (Figure 2).

Figure 9: NH_4 spikes intensified after 14.8 ka BP.

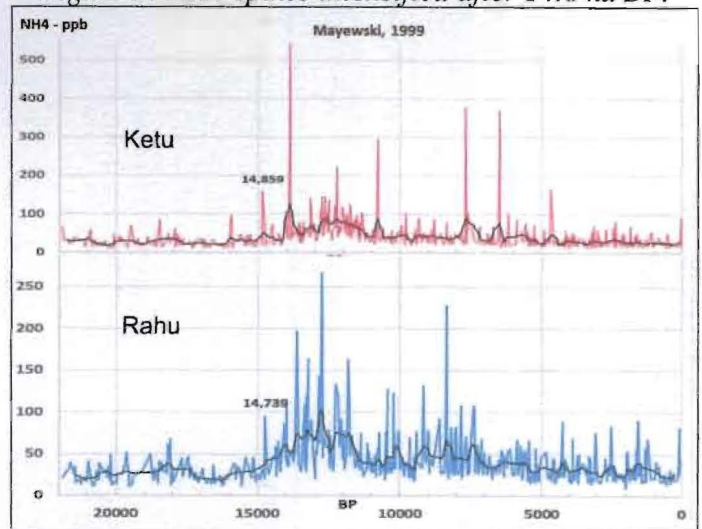
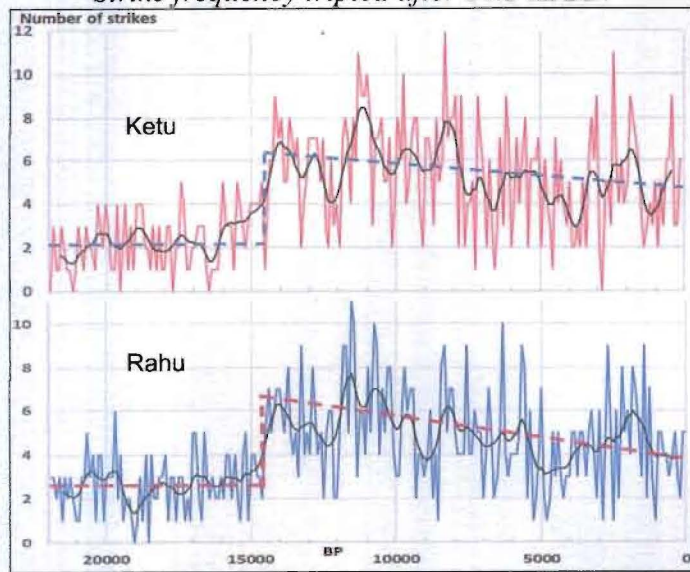


Figure 10: Number of strikes per 96-year period.
Strike frequency tripled after 14.5 ka BP.



Description of Rahu and Ketu

Orbital parameters

By Kepler's third law,

$$T^2 \sim a^3$$

where

T is the period in years

a is the semi-major axis in Au

For $T = 16$ years,

$$a = 6.35 \text{ Au}$$

In order to intersect Earth at mid-summer and mid-winter, the semi latus rectum ℓ of the ellipse is

$$\ell = 1 \text{ Au}$$

Given a and ℓ , then b can be calculated.

$$a * \ell = b^2, \text{ then}$$

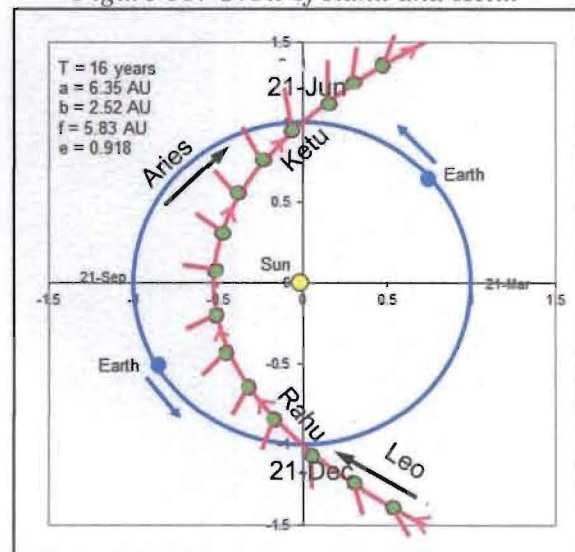
$$b = (6.35 \text{ Au} * 1 \text{ Au})^{0.5} = 2.52 \text{ Au}$$

Given a and b , the eccentricity e and can be calculated.

$$e = (1 - b^2/a^2)^{0.5} = 0.918$$

$$f = (a^2 - b^2)^{0.5} = 5.83 \text{ Au}$$

Figure 11: Orbit of Rahu and Ketu.



Orbital direction of Rahu and Ketu

The twin planets could orbit the Sun in retrograde motion in two directions relative to Earth (Figure 12). In either case, a strike in June would proceed from West to East. Even if the poles flipped, it would not change the constellation of the approach (Thanks to Ravi Shah).

On the left, the constellations match Hindu astrology:

Rahu: approach from Leo, exit to Aquarius

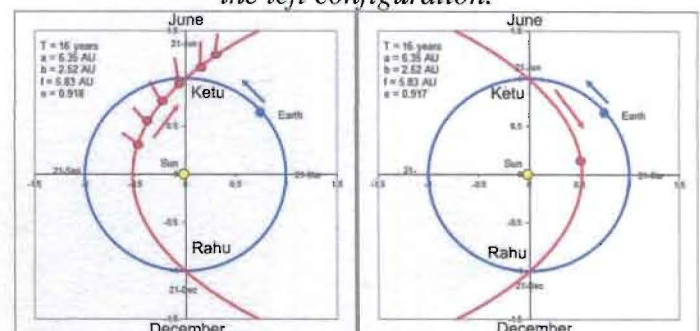
Keto: approach from Aries, exit to Scorpio

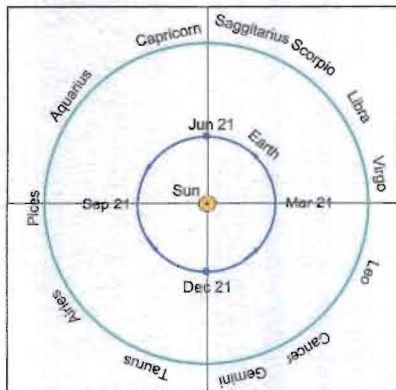
On the right, the constellations do not match Hindu astrology:

Rahu: approach from Scorpio, exit to Aires

Ketu: approach from Aquarius, exit to Leo

Figure 12: Two possible orbital configurations.
Constellations associated with each planet align with the left configuration.

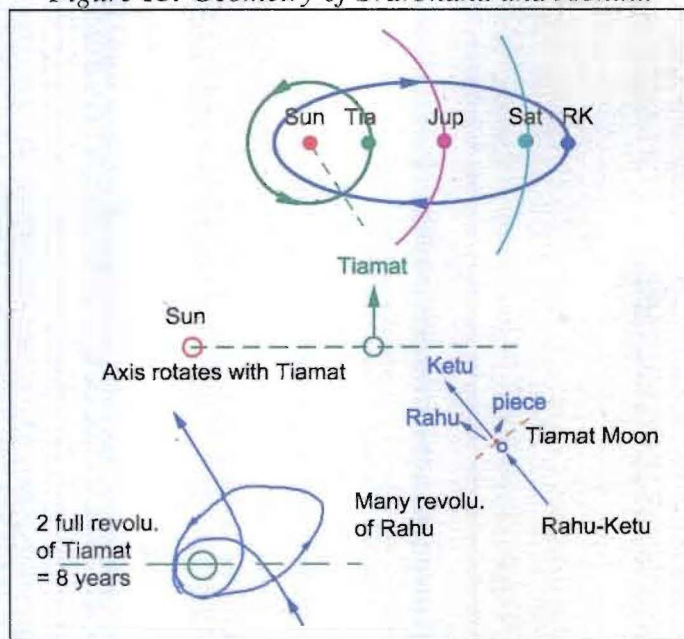




How Mohini separated head from body by 8 years

An interesting question is how Mohini cleaved Svarbhanu into three pieces. She did it by impaling Svarbhanu with a small moon. Next, she temporarily captured Rahu for two full orbits then released the planet in the same direction as Ketu. The third piece conserved momentum and spiraled into Earth (Figure 13).

Figure 13: Geometry of Svarbhanu and Mohini.



Which sequence is Rahu and which is Ketu?

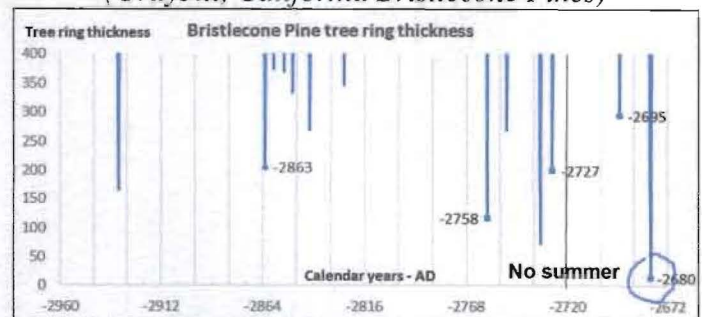
A mid-winter intercept by Rahu would more likely cause a Bristlecone pine tree-ring minimum than a mid-summer intercept by Ketu. This difference is sufficient to identify the timing of each.

Bristlecone Pines are sensitive to a cold spring that prevents the ground from defrosting and sap to flow. Trees heat their roots, but not enough to overcome a deep cold.

Five minimum tree rings near 2720 BC align with the twin planets; four of these are between 16-year grid lines and one on a grid line (Figure 14).

Therefore, strikes between grid lines belong to Rahu the head who struck in mid-winter and severely impacted tree-ring growth. Strikes on grid lines belong to Ketu the body, who struck in mid-summer after tree-ring growth had nearly completed.

Figure 14: Bristlecone Pine tree ring thickness.
(Graybill, California Bristlecone Pines)



Was their orbit retrograde?

Hindu astrology specifies that Rahu and Ketu moved in a retrograde motion, opposite that of other planets.

Capture of a comet by the Sun from the Inner Oort Cloud requires that the comet interact with one or more large planets to slow down the comet. This is possible if the comet's orbit is retrograde and crosses in front of the planet; otherwise, the interaction will speed the comet up.

Which moon was eclipsed?

Hindu mythology says both Rahu and Ketu eclipsed Chandra, the moon; however, Moon is new, acquired in 11,384 BP from planet Tiamat (Spedicato, 2012).

The moon referred to in Hindu mythology was an older moon, that body we now call **Mars**. Emilio Spedicato discovered its dimensions:

For a long time, I wondered about the distance of Mars from Earth before capture of Moon. A solution appears in a passage in Censorinus book *De die Natali*, where this Roman scholar of the third century AD writes: the Arcadians claim, but

I do not believe, that before Moon existed, the year had not twelve but three months.

From this passage, Spedicato deduced that Mars was one million kilometers from Earth, had an apparent diameter 3/4 of Moon, and orbited 3 times a year. The albedo of Mars is higher than that of Moon, 0.16 vs 0.11, so it was about as bright as Moon (Spedicato, 2012).

Who was Mohini?

Mohini was the only female avatar of Vishnu. She was large enough to temporarily capture Rahu, and lay within the 16-year orbit of the twin planets. Only one planet fits that description – planet Tiamat, called ‘Mother’ on Sumerian cylinder seal VA-243 and ‘Mother’ in the Babylonian creation story *Enuma Elish*. Mohini comes from *emohini* meaning ‘my mother’.

Tiamat had a mass 3 times greater than Earth’s, an orbit of 4 years, and a collection of 7 moons. Her color was bluish-green. She ceased to exist in 11,403 BP when planet Nibiru impaled her with one of its four moons and she exploded. The resulting debris dimmed the Sun for a long time, and sea level fell (Figure 2).

Decipherment of Hindu names

In 20,000 BP, the only known European language was Finnish, written as Old European (Harris, 2011). By extension, Finnish may also have been the language of the Hindu creation myth. If so, proper names might translate into Finnish. For example:

Amrita ‘Elixir of immortality from the celestial ocean’ < *Aja-meri-ta* ‘Unknown age of the sea’

Ashlesha ‘Vasuki’ < *Ahjs-lle saja* ‘Metal for a saw’

Asura ‘Demon in the sky’ < *Ahjs-ura* ‘Metal trail’

Chandra ‘Moon god’ < *Akan tora* ‘Woman’s fight’

Devaloka ‘place of the gods’ < *Taivas lonka* ‘Sky cloud-patch’

Ketu ‘dragon’s tail, meteor’ < *kyy-tu* < *kyy-tuhoaja* ‘Serpent destroyer’

Mohini ‘female avatar of Vishnu, Tiamat’ < *Emo-hini* ‘My mother’

Rahu ‘eclipse’ < *Raju* ‘fierce, violent’

Surya ‘Sun god’ < *Sur-j’a* < *Surri jumala* ‘Great god’

Svarbhanu ‘Splendor of Radiance’ < *Ahjs vaara paha ennus* ‘Metal danger evil omen’

Vasuki ‘King of snakes coiled around Lord Shiva’s neck’ < *Aava-suu kyy* ‘Open-mouthed serpent’

Vishnu ‘the preserver’ < *Viitsin uro* ‘I tend man’

Conclusions

Pieces left from the destruction of two planets, Rahu and Ketu, continued to follow their original 16-year orbit. Annual interception of these pieces led to a rapid rise of sea level, primarily from ablation of ice sheets.

Each strike was recorded as a spike of ammonium in ice cores, and reflects catastrophic incineration somewhere on the planet.

The description of their capture in Hindu mythology, and their demise that ended the ice age, provides enough material to conceptualize the origin and cyclicity of the ice ages.

Bibliography

Baillie, Mike (2007); The case for significant numbers of terrestrial impacts through the late Holocene; *J. of Quaternary Science*, 22(2), 101-109.

Baillie, Mike (2012); Why the Mayan calendar starts in 3114 BC; online at ResearchGate. While doing research on the Mayan calendar, he found major recurring strikes at 3089-year intervals, the third of which was in 5760 BC. A closer inspection reveals that the spikes are spaced apart in multiples of 16 years.

Graybill, Donald (1963); California Bristlecone Pines (-6000 to 1979) and White Mountain Bristlecone Pines (-5141 to 1962).

Harris, Stuart L. (2011); Old European texts from ice-age Europe; online at migration-diffusion/info

Harris, Stuart L. (2022); Planet Vasuki within the Inner Oort Cloud ended many ice ages; on line at www.migration-diffusion.info

Mayewski, Paul Andrew (1996); Taylor Dome ions.

Mayewski, Paul Andrew (1999); GISP2 Ions: Deep (D) Core (detailed); on line at Pangaea.55533.

Patton, Donald W. and Samuel R. Windsor (1996); The Mars-Earth Wars ending 701 BCE; Pacific Meridian Publishing Co., Seattle; reprinted in paperback 2020, title changed to The Mars-Earth wars and the destruction of Lucifer's planet; Safe Trek.

Spedicato, Emilio (2012); From Nibiru to Tiamat, an astronomic scenario for earliest Sumerian cosmology; on line at academia.edu.

Trivedi, Prash (2016); The Rahu Ketu Experience; Sagar Publications.

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