

Yajnavalkya's 95 Years Cycle of Synchronisation

Subjects: Physics, Applied | Physics, Mathematical | Astronomy & Astrophysics

Contributor: Santosh Kumar Chaudhary

Yajnavalkya's 95 Years Cycle of Synchronisation is the model proposed by the great Indian philosopher **Yajnavalkya** which explains the **mathematical** concept of the **synchronisation** of the **motions of the Sun and the Moon**. Yajnavalkya invented the 95 years of the **periodic cycle**, when the solar and lunar motions get synchronised. This **95 years of the periodic cycle** is also known as **Yajnavalkya Cycle**.

Keywords: Physics ; Astronomy ; Synchronisation of the solar and lunar motions ; Mathematical Physics ; Shatapatha Brahmana ; Observational Astronomy ; Solar and lunar motions ; Indian Calendars

1. Introduction

The **Yajnavalkya 95-year cycle** is a method of **reconciling** the lunar and solar calendars. It was proposed by the ancient Indian sage **Yajnavalkya**, who is believed to have lived around the 9th - 8th century **BCE**.^{[1][2]}

This method of **harmonization** between the lunar and solar calendars is very important in making Indian **Calendars**.

The relative positions of the Sun and the Moon in the sky are constantly changing. This means that the positions of the Sun and the Moon relative to each other will gradually change over time. However, there is a pattern to this change. Every 95 years, the Sun and the Moon return to approximately the same positions in the sky at the same time of year. This is because 95 is the least common multiple of the synodic periods of the Sun and the Moon (the synodic period is the average time between two successive conjunctions of the Sun and the Moon).

The accuracy of the **Yajnavalkya cycle** is remarkable. After 95 years, the Sun and the Moon are only about 1° out of alignment. This is because the synodic periods of the Sun and the Moon are not exactly constant. They vary slightly due to the elliptical shapes of the orbits of the Earth and the Moon. However, the variations are small enough that the **Yajnavalkya cycle** remains accurate for centuries.

According to **Eggeling**, the same 95 Years of cycle was also mentioned by the school of **Shandilya** in the **10th-14th Kanda** of **Satapatha Brahmana**, therefore it is also known as **Shandilya Cycle**.^[3]

2. Concept of the Cycle

The **lunar calendar** is based on the cycles of the Moon, and has 12 months of 29.5 days each. This means that the lunar calendar is about 11 days shorter than the solar calendar, which is based on the Earth's orbit around the Sun.

There is a logic behind this cycle that if the year is counted as **360 Tithis**, then this leads to exactly 35 intercalary months (with a residual small error) in 95 years. **Thithi** means lunar day.

The **Yajnavalkya 95-year cycle** corrects for this difference by adding an extra month (**Adhika Masa**) to the lunar calendar every 32.5 years. This means that in a 95-year cycle, there will be 71 lunar years and 70 solar years.

Here is an example of how the Yajnavalkya 95-year cycle works:

If in the **Yajnavalkya Year 1**, the solar and lunar calendars are aligned.

Then in the year 2, the lunar calendar is 11 days behind the solar calendar.

In the year 32.5, an extra month is added to the lunar calendar to bring it into alignment with the solar calendar.

In the year 43.5, the lunar calendar is 11 days behind the solar calendar again.

In the year 65, an extra month is added to the lunar calendar to bring it into alignment with the solar calendar again.

In the year 95, the solar and lunar calendars are aligned again.

Yajnavalkya Year

Yajnavalkya took **360 days (Tithis) or 12 months** (each month having **30 days**) in a year to devise the concept of the synchronisation of the solar and lunar motions in the calendar. This period of 360 days in a year is called as **Yajnavalkya Year**. Similarly the period of 95 **Yajnavalkya Years** make a **Yajnavalkya Cycle**.

Adhika Masha

A **lunar year** is 354 days and a solar year is 365 days. In this way, there is a difference of 11 days between the two and in three years this difference becomes 33 days, which is called **Adhika Masha or** extra month. On the basis of astrology, to eliminate the difference of these 11 days of the lunar and solar year, arrangements have been made for more months in three years.^[4]

3. Metonic Cycle

Yajnavalkya's 95-year cycle consisted of five sub-cycles of 19 years each. The 19 year subcycle is presently called the **Metonic cycle**. The 19 year cycle was derived from the 95 year cycle.

4. Sources of the Theory

The main sources of the theory and the model are **Shatapatha Brahmana** and **Shukla Yajurveda**. Yajnavalkya was Indian **astronomer** who studied about the motion of the Sun and mentioned these theories in his work **Shatapatha Brahmana**. He invented a method of reconciling the lunar calendar and the solar calendar.^[5] He described the 95-year cycle to synchronize the motions of the sun and the moon.^[6] It is mentioned as 95 year "**Agnichayana**" in the 6th **Kānda** of **Shatapatha Brahmana**.^[7] The **Yajnavalkya cycle** is a testament to the astronomical knowledge of the ancient Indians. It is a complex and accurate system that has been used for centuries to predict astronomical events. It shows that the ancient Indians had a deep understanding of the motions of the heavenly bodies. According to **Shatapatha Brahmana**, while performing **Yajna** the process of intercalation is included as a prescription that 95 **altars** be built in a sequence defining the 95-years cycle.^[3]

5. Introduction to Yajnavalkya

Yajnavalkya was described as the greatest **Brahmajnyani** by all the sages at the function organised by the king **Janaka** in the ancient **Mithila** region at his court. The headquarter of the **Ancient Mithila University** was the court of the King Janaka .^[8] Yajnavalkya was a great **multidisciplinary** scholar, philosopher, astronomer and theorist of the **Vedic cosmology**. He was running his own individual institution for the study of **Vedas** and cosmology at **Jagban** village in the Mithila region of the **Madhubani** district in the present Bihar state of India. This institution is known as **Yajnavalkya Ashram** . The Teachings of Yajnavalkya include the physical and metaphysical concepts of Space, Time and Consciousness. Due to his multidisciplinary wisdom, Yajnavalkya is taken as an **epitome** of knowledge and is considered as the **Father of the Indian Philosophy**. The major **Upanishads** of the Indian philosophy are attributed to Yajnavalkya. The concept of **Atman and Brahman** was strengthened by Yajnavalkya in his works of Upanishads. Similarly the concept of space and time discussed with the woman philosopher **Gargi Vachaknavi** at the court of King **Janaka** is the earliest reference on the concept of **space - time** in the intellectual history of the world.



References

1. Subhash Chandra Kak. THE SUN'S ORBIT IN THE BRAHMANAS. *Indian Journal of History of Science*. **1998**, NA, 33.
 2. THE SUN'S ORBIT IN THE BRAHMANAS. Louisiana State University. Retrieved 2023-12-23
 3. The Astronomical Code of the Rgyveda (Third Edition). www.academia.edu. Retrieved 2023-12-23
 4. Adhik Maas 2023: क्यों लगता है अधिक मास, अधिक मास ना लगे तो क्या होगा?. ABP Live. Retrieved 2023-12-23
 5. Boutet, M. G. (2017-07-11). Celtic Astrology from the Druids to the Middle Ages. McFarland. ISBN 978-1-4766-7004-1
 6. Powell, Jonathan (2018-09-17). Rare Astronomical Sights and Sounds. Springer. ISBN 978-3-319-97701-0.
 7. Astronomy of the Satapatha Brahmana. Research Gate. Retrieved 2023-12-23
 8. Ancient Mithila University. Notion Press. Retrieved 2023-12-23
-

Retrieved from <https://encyclopedia.pub/entry/history/show/119896>