

## HISTORICAL NOTES

### 5-YEAR YUGA IN THE VEDĀṄGA JYOTIṢA

It is argued that the *Vedāṅga Jyotiṣa* has a 5-year yuga and not a 19-year Metonic cycle.

This note is not meant for raising eyebrows on advocate P. V. Holay's unconventional interpretation of *Ṛg jyotiṣa* verses that it has a 19-year Metonic cycle; it aims at presenting arguments to show that it is not so. The author was one of the few first persons who appreciated the originality of Holay's arguments. Not only did the author write a commendable review of Holay's first Marathi book<sup>1</sup> on the subject published in 1986 in the magazine '2001', but he also presented the gist of that book in the meeting of the Astronomical Society of India at Srinagar, Kashmir. The author was also responsible for extending an invitation to Holay to put forward his ideas in the seminar on Ancient Indian Astronomy held at Birla Planetarium, Hyderabad in 1987. Since then both of them had a lot of correspondence as friends having common interest.

In 1980's the author did not know much about *Vedāṅga Jyotiṣa* except what is given in S. B. Dixit's Marathi book<sup>2</sup> *Bharatiya Jyotish Shastra*. Since then he has been interested in tracing the evolution of Vedic astronomy over thousands of years, particularly because no one had tried to do so earlier. They had tried to fix one fixed epoch for the entire Vedic astronomy. For his purpose the author not only studied the various commentaries of *Vedāṅga Jyotiṣa* including that of T. S. Kuppanna Sastry<sup>3</sup>, but also went through the original books of B. G. Tilak, A. C. Das, P. C. Sengupta, R. Shamasastri, J. Bently, S. Kak, D. Frawley and W. Brenard and browsed through R. H. Griffith's *Ṛgvedic Brāhmaṇas*, Hindi translation of *Ṛgveda* edited by S. B. Acharya,

Egging's *Śatapatha Brahmana* and A. B. Keith's *Rgvedic Brahmana*. It was realized that the evolution of Vedic astronomy was a slow process involving gradual transmission of observational knowledge from one generation to another and consequent changes in the development of a viable calendar. Our general conclusion<sup>4</sup> are briefly presented in the Project Report which gives several references. The 19-year yuga does not fit into this scheme. We present here our well considered objections to Holay's brilliant hypothesis:

1. The number 19 or the term 19-year yuga is nowhere mentioned in *Vedāᅅga Jyotiᅅa*. It speaks of a *pañca-samvatsara* yuga which means a yuga of 5 years, which is quite often mentioned in the Vedic literature<sup>5</sup>. One cannot detach *Rgᅅjyotiᅅa* from the rest of Vedic literature, particularly from *Yajurjyotiᅅa*, which according to Holay has a 5-year yuga.
2. The word '*saᅅvatsara*' is quite generally used for the year in Vedic times, and it is even used in that sense as for example Citrabhāᅅu *saᅅvatsara*, etc. Further the order of years in the *Vedāᅅga Jyotiᅅa* is also found elsewhere including the order of years in the earlier 6-year yuga system except renaming of *Iduvatsara* as *Anuvatsara*<sup>6</sup>. So these names do not signify any particular types of years. The author of *Rgᅅjyotiᅅa* would have been more specific if he had that significance in mind.
3. *Vedāᅅga Jyotiᅅa* is a luni-solar calendar based on lunar months. It makes use of a nominal yuga of 1860 *tithis*, which is defined in *Yajurjyotiᅅa*. As the units of angle and time obtained from it are also used in *Rgᅅjyotiᅅa*<sup>7</sup>, it is obvious that the two versions complement each other and pertain to the same kind of yuga. Since the yuga in *Yajurjyotiᅅa* is accepted to be a 5-year yuga by Holay, that in *Rgᅅjyotiᅅa* it has to be a 5-year yuga. The both versions are attributed to the same author viz. sage Lagadha.
4. As the yuga itself is nominal, the *tithis* and *nakᅅatras* of the *ayanas*, equinoxes and seasons, which are based on one extra *tithi* per year, are also nominal and good enough for practical purposes of seasonal sacrifices. There may occur a shift in the religious functions with respect to seasons, but it can

be corrected systematically as explained in section 5. Such shifts of  $\pm 15$  days are allowed even in the modern *pañcāṅga*, which even neglects the effect of precession or *ayanacalana*.

5. The nominal 5-year yuga has a year at 372 *tithis* or 366 days, but Lagadha knew that the year contain 371 *tithis*, and 1860 *tithis* are covered in 1831 days and not in 1830 days. So he has provided corrections which make the calendar more accurate by means 15-year or 30-year and 95-year cycles, as shown by us<sup>7</sup>. It may be noted that the 15-year cycle follows from the *Ṛgvedic* verse R12. These are unique features of the Vedic calendar which throw light on the evolution of Vedic calendar. They should not be thrown away for the sake of running after the alien Metonic cycle. Indians knew the 95-year cycle as shown by Kak<sup>8</sup>. But it is made of modified 5-year cycles and has nothing to do with Metonic cycle.

6. In order to accommodate 371 *tithis* in a year, Holay has reduced the number of *bhamsas* from 3348 to 3339 in a circle. But it spoils the unit of angle. We have shown<sup>7</sup> that it is not necessary to do so if we follow the correcting procedure referred to above.

7. In Holay's scheme the lunar year does not always start with Sun in Dhanīṣṭhā *nakṣatra*. So he has to go back to the 5-year cycle and modify it by introducing three *vatsara* year of 12 lunar months in the 16<sup>th</sup>, 27<sup>th</sup> and 38<sup>th</sup> year<sup>1</sup>. There is no hint of this in *Yajurjyotiṣa*, so it amounts to using numerology to fit the calendar to the 19-year cycle. Lagadha achieves it by making adjustment at the end of every 15-years. As already there is a difference of one *nakṣatra* at that point he does not have to wait till the end of 19-years as envisaged by Holay. If his interpretation of R5 is correct it will represent the beginning of the yuga in the second half of the 30-year cycle. Holay also does not explain the reduction of *kṣaya tithis* from 30 to 29 in one yuga.

8. Holay has tried to make yearly adjustment involving inconvenient fractions. But adjustment at the end of 15 years in the 5-year yuga system is simpler to operate with integers.

9. Finally, it should be noted that once discovered, astronomers will not abandon the 19-year cycle as we find in the Jewish and Chinese calendars. On the other hand the Jain astronomers continued to use the 5-year cycle in their calendar. It is obvious that Vedic astronomers did not use the 19-year cycle and preferred to use the modified 5-year cycle.

On the whole, advocate Holay's is a brilliant legalist attempt to prove a preconceived hypothesis by assigning cryptic meanings to *Rgvedic* verses.

### REFERENCES

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