

The Pañcasiddhāntikā of Varāhamihira : A puzzling problem in its presently available text

K. V. Sarma

Adyar Library & Research Centre, Madras 20, India

Abstract. It is pointed out that *Pañcasiddhāntikā* of Varāhamihira lacks the sequential and logical arrangement of topics as found in his other works like *Bṛhajjātaka*. It is concluded that the presently available version might be only a draft of the complete work.

Key words : Pañcasiddhāntikā of Varāhamihira

1. Introduction

The *Pañcasiddhāntikā* (*PS*) (K.V. Sarma, 1993; Neugebauer and Pingree, 1990; Thibaut 1968) of the sixth century astronomer Varāhamihira (*VM*) is, as its name implies, a treatise concerning the Five Systems of Indian astronomy which were current during the early centuries of the Christian era, they being the *Paitāmaha-siddhānta*, *Vāsiṣṭha-siddhānta*, *Paulīśa-siddhānta*, *Romaka-siddhānta* and *Saura-siddhānta*. The value of the *PS* is all the more so for the reason that the original texts of none of these five systems is available now, presumably on account of their desuetude. This would mean that the *PS* is the only authentic source that gives one an idea of the nature and contents of these five systems. However, it is necessary to stress here that the treatment of these systems found in the *PS* is neither in the form of extracts nor of full summaries nor the original words of these systems, as is often supposed. In fact, the *PS* is a 'selective' 'resume' of certain sections of the systems, given in *VM*'s own words. More than this, there are verses in the work where two systems are compared, treated together, one stated to be following another, one being superior to another and one being superior to the others in certain aspects but not so in certain other respects.

2. Contents of Pañcasiddhāntikā

Varāhamihira, it is well known, is a prolific writer with a dozen works to his credit. It is also well known that his works are characterised by sequential and logical arrangement of the topics and methodical and systematical presentation of those topics. The popular *Bṛhajjātaka* and *Bṛhatsamhitā* bear ample testimony to this aspect of his writings. However, his

Pañcasiddhāntikā, as it is available now, lacks this distinctive characteristic of VM. This would be clear from the disposal herein of the several chapters and their contents. The colophons to the several chapters read :

- Ch. 1. *Karanāvātārah* : Introduction to the work which is a manual.
2. *Naksatrādi-c-chedah* : Planetary computation etc. in *Vasiṣṭha-siddhānta*
3. *Paulīśa-siddhāntah* : *Paulīśa-siddhānta* (Planetary computation etc.)
4. *Karanādhyāyah* : Chapter on *Karaṇa* (i.e. Problems of Space, Time and Direction).
5. *Śāsīdarśanam* : Moon's cusps (in *Paulīśa-siddhānta*).
6. *Candragrahaṇa* : Lunar eclipse (in *Vāsiṣṭha-Paulīśa-siddhāntā*)
7. *Paulīśa-siddhānte Ravigrahaṇam* : *Paulīśa-siddhānta*, Solar-eclipse.
8. *Romaka-siddhānte Ravigrahaṇam* : *Romaka-siddhānta*, Solar eclipse.
9. *Saura siddhānte Ravigrahaṇam* : *Saura-siddhānta*, Solar eclipse.
10. *Candragrahaṇam* : Lunar eclipse (in *Saura-siddhānta*).
11. *Anuvarṇanam* (Eclipse diagrams).
12. *Paitāmaha-siddhāntah* : *Paitāmaha-siddhānta* (Some topics).
13. *Trailokyadarśanam* : Situation of the Earth and Cosmology.
14. *Chedyaka-yantrāni* : Graphical methods and astronomical instruments.
15. *Jyotiṣopaniṣad* : Secrets of astronomy.
16. *Saura-siddhānte Madhyagatiḥ* : *Saura-siddhānta*, Mean motion (and Mean planets).
17. *Tārāgraha-sphuṭikaraṇam* : True planets. (in *Saura-siddhānta*).
18. *Paulīśa-siddhānte Tārāgrahāḥ* : (*Vāsiṣṭha*) - *Paulīśa-siddhānta*, Rising and setting of planets.

Incomplete and often incorrect specification of the subjects and the disconnected arrangement of the topics as above do not do much justice to any author, let alone the meticulous Varāhamihira. Thus, while the planetary computations according to the *Vāsiṣṭha-siddhānta* are stated in ch. 2, its Lunar eclipse is described in ch.6, and Rising and setting of planets in ch. 18. of *Paulīśa-siddhānta*, Planetary positions are in ch.3, while phases of the Moon are dealt with in ch.5, lunar eclipse in ch.6, solar eclipse ch.7, and rising and setting of planets in ch. 18. Of the *Saura-siddhānta*, while Mean and True planets are depicted in two later chs., 16 and 17, its Lunar eclipse has been dealt with earlier, in ch. 10, and solar eclipse in ch. 9, and rising and setting of planets in ch.17. Chapter 12, in just 6 verses, on the *Paitāmaha-siddhānta* mentions just a few general things. In between the above different chapters have been placed, with no apparent logic of sequence, Eclipse diagrams in ch.11, situation of the earth and cosmology in ch.13, astronomical instruments in ch.14, and *Jyotiṣopaniṣad* (Secrets of Astronomy) in ch.15. Obviously, no effort seems to have been made to give the chapters in full and arrange the topics in due sequence. The colophons are often incomplete, non-uniform and not self-explanatory.

3. The puzzle in Pañcasiddhāntikā

The above - noted situation of the text of *PS* 'as available today' is surprising. For an answer one shall have to go to the 'lone' manuscript of the *PS*, on the basis of which and of all the other manuscripts derived directly or indirectly from the said 'lone' manuscript or its ancestor, all the editions of work have been prepared. This 'lone' manuscript is highly defective and exhibits corrupt readings, interchange of words, lacunae, and displacement of long passages, which are repeated in every one of the manuscripts available. G. Thibaut 1968, describes this manuscript as "imperfect and fragmentary" (cf. Preface to his edition, p.v.), and D. Pingree, (Neugebauer and Pingree, 1970) the next editor, says : "The present edition of the *Pañcasiddhāntikā* does not solve all the remaining problems connected with the text. We suspect that much will never be understood unless better manuscript material becomes available". (cf. his edition, pt. I, p.19).

This piquant state of affairs gives rise to the doubt as to whether the text which is available in the said 'lone' manuscript represents the 'final' or 'full' form of Varāhamihira's work, at all. Circumstances conduce to the feeling that the 'lone' manuscript is, after all, just an 'interim draft' of the work, which has somehow been preserved and has come down to later times, as copied in the 'lone' manuscript. However, the genuineness of this 'Draft' as the basis of the fuller and properly presented text of, *Pañcasiddhāntikā*, cannot be disputed. The reason for this is that *Pañcasiddhāntikā* has been referred to by Varāhamihira himself as his *Karaṇa* ('astronomical manual') in his *Bṛhatsamhitā* (17.1) and most of the verses quoted by later astronomers as from *Pañcasiddhāntikā* occur herein. Thus Utpala (*Bhaṭṭotpala*) quotes as many as 117 verses from *PS* in his commentary on the *Bṛhatsamhitā* of Varāhamihira, *Prthūdakasvāmi*, 8 verses in his commentary on the *Khaṇḍakhādyaka* of Brahmagupta, Sūryadeva Yajvan, 33 verses in his commentary on the *Āryabhaṭṭīya*, Parameśvara, one verse in his commentary on the *Āryabhaṭṭīya*, Nīlakaṇṭha Somayāji, 3 verses in his *Jyotirmīmāṃsā*, and six verses in his *Bhāṣya* on the *Āryabhaṭṭīya*, and Makkibhaṭṭa, 5 verses in his commentary on Śrīpati's *Siddhāntaśekhara* see K. V. Sarma (1993), Appendix II, p.371

The conclusion that Varāhamihira's *Pañcasiddhāntikā* is a bigger text than what has been preserved in the 'lone' manuscript, a point made also by Pingree (vide his edition, p.21) is borne out from other considerations as well. For one thing, some of the verses quoted by later astronomers as from *Pañcasiddhāntikā* are not to be found in the 'Draft' *PS*. e.g. *PS* 4.43 c-d, 44, 45 a-b, and 6.8a-b, quoted by Utpala and incorporated in the editions of *PS*, with due mention of their source, and two other verses quoted by Nīlakaṇṭha Somayāji in his *Bhāṣya* on *Āryabhaṭṭīya*. In his *Bṛhatsamhitā*, 17.1, where he refers to his *karana* (i.e. *Pañcasiddhāntikā*), Varāhamihira. says also that in that work he had dealt also with the conflicts (i.e. transits) of the planets according to the *Sūryasiddhāntā* Cf. the verse :

Yuddham yathā yadā vā bhaviṣyad ādiśyate trikārajñaiḥ/
tadvijñanam 'Karaṇe mayā kṛtam Sūryasiddhāntāt'//

Br. S. 17.1//

In the present 'lone' manuscript however, no such treatment is to be found. Moreover, there are several instances of minor variations in the readings of the verses as found in the 'lone' Ms. from those found in the quotations. Then again, Utpala, who had with him a full-fledged text of the *Pañcasiddhāntikā*, speaks also of an abridgement thereof by Varāhamihira himself. Thus introducing his commentary on the *Laghujātaka* of Varāhamihira, Utpala says : *Varāhamihira. . . Jyotiśśāstrasāṅgraham kṛtvā, tadeva vistara-grantha-bhīrūṇām kṛte saṅkṣiptam gaṇita-śāstram kṛtvā horāśāstram vaktukāmah...*, ('Varāhamihira, after writing the condensation of astronomical works', wrote also an abridged version thereof for the sake of those who are averse to longish works, is now attempting to write on horāśāstra . . .').

4. Conclusion

The above consideration would tend to show that the text of *Pañcasiddhāntikā* contained in the 'lone' manuscript, which alone is available now and which or its derivations have been used for editing the text, is only a 'Draft' of the work which has come down to us and does not represent the 'full and final' text of Varāhamihira's *Pañcasiddhāntikā*. It behoves upon scholars to look for complete manuscripts of the *PS* for a more detailed study.

References

- Neugebauer O., Pingree D., 1970, The *Pañcasiddhāntikā* of Varāhamihira, 2parts. Edited and translated.
- Thibaut G., 1968, The *Pañcasiddhāntikā*, the astronomical work of Varāhamihira; the text edited with an original comentary in Sanskrit and an English translation and introduction, Leipzig/Benares 1989, Reprinted, Lahore 1930, Varanasi, 1968.
- Sarma K. V., 1993, *Pañcasiddhāntikā* of Varāhamihira with translation by T.S. Kuppanna Sastry, critically edited with introduction and appendices, Adyar Library, Madras.