The Nakṣatra system of the *Atharvaveda-Pariśiṣṭa*

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1 Introduction

The *Atharvaveda-Pariśiṣṭa* (abbr. AVPar) attracted attention of the great Indologists in the nineteenth century, but partly due to its poor text transmission,[1] it has not been studied sufficiently. In recent years, however, Peter Bisschop and Arlo Griffiths published translations of chapters 36 and 40 (IIJ 46, 2003 and SII 24, 2007 respectively). Griffiths [2007] offered an edition of the Orissa version of the *caraṇavyūha* comparing it with AVPar 49. Thanks to their works, especially that of 2003 which offered a useful table summarizing the past studies on AVPar, it turned out that the chapters which are still waiting for further studies are those which contain astrological and divinatory elements, such as chapter 1 (*Nakṣatrakalpa*) and chapters 50–57. Since I have published a separate paper on chapters 50–57[2] I would like to focus our present attention to the *Nakṣatrakalpa* (abbr. NK) and elucidate the *nakṣatra* system in this chapter. While doing so I would like to compare the older versions of the *nakṣatra* system which are attested in the Buddhist text *Śārdūlakarṇāvadāna* (abbr. SKA) as well as in Varāhamihira's *Bṛhatsaṃhitā* (abbr. BS). Judging from the astrological contents of these chapters we will see a similar background of these three texts.

Some of the chapters of AVPar are very similar to those of BS.[3] Especially noteworthy is a paragraph consisting of consecutive twelve verses, AVPar 64.8.9–10 and 64.9.1–10, which describe auspicious portents in the six seasons. These verses are repeated *verbatim* by Varāhamihira as BS 45.93–94 and 83–92. The only difference is that while AVPar begins the description with the cold season (*śisira*, AVPar 64.8.9–10), BS begins with the first month (*madhu*) of the spring season (*vasanta*, BS 45.83–84). The difference seems to reflect the difference of the year beginning: while AVPar begins the year with the winter solstice, the year beginning of BS was near the vernal equinox.

These similarities testify that when Varāhamihira compiled the *Bṛhatsaṃhitā* he used the same sources that AVPar used and he put some modifications in order to adjust them to his time and place. AVPar, on the other hand, kept old elements as

[1] The edition by Bolling and von Negelein changed the situation, but still there remain many difficult passages.

[2] Maejima-Yano [2010].

[3] AVPar 5 ≈ BS47, AVPar 19 ≈ BS43, AVPar 50 ≈ BS4, AVPar 51 ≈ BS17, AVPar 52 ≈ BS11, AVPar 53 ≈ BS5, AVPar 54 ≈ BS11, AVPar 56 ≈ BS14, AVPar 57 ≈ BS32, AVPar 58 ≈ BS31, AVPar 58b ≈ BS33, AVPar 60 ≈ BS38, AVPar 61 ≈ BS30, AVPar 62 ≈ BS32, AVPar 63 ≈ BS34, AVPar 64 ≈ BS35 & 45, AVPar 65 ≈ BS28, AVPar 70b ≈ BS42 & 45.

they were. Thus we can say that the lower limit of the date of AVPar is the middle of the sixth century, namely, the date of the *Bṛhatsaṃhitā*.

AVPar shows some aspects of development of the older elements of astrology. This is typically found in the *nakṣatra* system. In what follows we would like to compare the *nakṣatra* system of AVPar with that of the *Śārdūlakarṇāvadāna*, which would set the upper limit of the date of AVPar.

2 *Nakṣatra* system

In ancient Indian astronomy and astrology two systems of the lunar mansions (*nakṣatra*s) were used, namely, longitudinally unevenly spaced twenty-eight *nakṣatra*s and evenly spaced twenty-seven *nakṣatra*s.[4] While the second system is a mathematical coordinates with each *nakṣatra* covering $13\frac{1}{3}^\circ$, just like the Western zodiacal signs, each covering 30°, and does not represent the true length of *nakṣatra*s, the first system reflects, to some extent, attempts of expressing the true length of the twenty-eight groups of stars.

There are several variations of the names of *nakṣatra*s. I have used those forms which are attested in AVPar, *Nakṣatrakalpa* 1.1. For the convenience of further reference, I have introduced the numbering beginning with Kṛttikā.

1	Kṛttikā	8	Maghā	15	Anurādhā	22	Śraviṣṭhā
2	Rohiṇī	9	P-phālgunī	16	Jyeṣṭhā	23	Śatabhiṣaj
3	Mṛgaśiras	10	U-phālgunī	17	Mūla	24	P-proṣṭhapada
4	Ārdrā	11	Hasta	18	P-āṣāḍhā	25	U-proṣṭhapada
5	Punarvasū	12	Citrā	19	U-āṣāḍhā	26	Revatī
6	Puṣya	13	Svāti	20	Abhijit	27	Aśvayuj
7	Āśleṣā	14	Viśākhā	21	Śravaṇa	28	Bharaṇī

Table 1 Names of *Nakṣatra*s (Note: P = Pūrva, U = Uttara)

2.1 Two *nakṣatra* systems in the *Śārdūlakarṇāvadāna*

First old system in SKA Two types of primitive *nakṣatra* systems are mentioned in the *Śārdūlakarṇāvadāna*, which is a part of the Buddhist text *Divyāvadāna*. The more primitive of the two systems is described using the simile of a cow and a calf:

> There are three kinds of *yogas* of twenty-eight *nakṣatras*, namely, the

[4] When *nakṣatra*s are counted twenty-seven, they are usually evenly spaced. The twenty-seven *nakṣatra*s in *Taittirīyasaṃhitā* IV.4.10 and *Taittirīyabrāhmana* I.5 and III.1 as reported in Pingree [1989, pp. 101–2] seem to be exceptional. The topic here is 'Nakṣatra Bricks'. Cf. Keith's English translation of the *Taittirīyasaṃhitā* p. 349. This topic was discussed by Weber [1860] who, refuting Biot's view of Chinese origin of the twenty-eight *nakṣatra*s, proposed their Indian origin. But I do not discuss the problem of the origin. Pingree [1989, p. 99] says that there is no ground for comparing the Indian *nakṣatra*s with the Chinese lunar mansions.

> *yoga* in which the cow[5] follows (the calf) from behind, the *yoga* in which the calf follows from behind, and the *yoga* in which both are tied together. Among them when the moon goes ahead and the *nakṣatra* behind, then there is a yoga where the calf is following. When, again, the moon and the *nakṣatra* are both equally go simultaneously, then this is called the both-tied *yoga*.[6]

Here the space in longitude occupied by the *nakṣatra*s are divided into three categories according to the time during which the moon stays in it:

(1) The space occupied by the *nakṣatra* is longer than the moon's daily gain in longitude. Thus the moon does not complete its stay in the *nakṣatra* in a day.

(2) The space occupied by the *nakṣatra* is shorter than the moon's daily gain in longitude. Thus the moon finishes its stay in the *nakṣatra* in less than a day.

(3) The space occupied by the *nakṣatra* is the same as the moon's daily gain in longitude. Thus the moon stays in the *nakṣatra* one whole day.

Versified version in BS Although SKA does not specify which *nakṣatra* belongs to which type, the classification must have been like that found in Chapter 4 of the *Bṛhatsaṃhitā*, which is entitled *Candracārādhyāya* (Chapter on the motion of the moon). Varāhamhira describes the three types of *nakṣatra*s as:

> The six (*nakṣatra*s) beginning with Revatī (26)[7] are *anāgata*, the twelve *nakṣatra*s beginning with Ārdrā (4) are *madhyayoga*, and the nine *nakṣatra*s beginning with Jyeṣṭha (16) are in conjunction with the moon after it has passed away.[8]

This seems to be a versified version of the older system of SKA just mentioned above. The six *nakṣatra*s called *anāgata* are type (1) of SKA, the twelve *nakṣatra*s called *madhyayoga* are type (3), and those which conjoin with the moon after the moon has passed them (*atītya yujyante*) are type (2). But here is a significant difference: the number of *nakṣatra*s in BS is twenty-seven (6+12+9), instead of twenty-eight. Another peculiarity of this older system is that the three groups of *nakṣatra*s are put in consecutive order, namely, the first six *nakṣatra*s are Nos. 26

[5]The text reads *ṛṣabha* 'ox', but in order to make this simile effective, we should read 'cow' or mother. I owe this note to an anonymous referee and Dr. Junko Sakamoto-Goto. Cf. Table 2 below.

[6]SKA p. 52.3: *... aṣṭaviṃśatīnāṃ nakṣatrāṇāṃ trayo yogā bhavanti, ṛṣabhānusārī yogaḥ, vatsānusārī yogaḥ, yuganaddho yogaḥ. tatra nakṣatraṃ yadi purastād gacchati, candraś ca pṛṣṭhataḥ, ayam ucyate ṛṣabhānusārī yoga iti. yad uta candraḥ purastād gacchati nakṣatraṃ ca pṛṣṭhataḥ, tadā bhavati vatsānusārī yogaḥ. yadi punaś candro nakṣatraṃ cobhau samau yugapad gacchataḥ, tadāyam ucyate yuganaddho yoga iti.*

[7]In this context the number of *nakṣatra*s is twenty-seven, but I used the reference number of the twenty-eight *nakṣatra*s used in Table 1 above.

[8]BS 4.7: *ṣaḍ anāgatāni pauṣṇād dvādaśa raudrāc ca madhyayogīni/*
jyeṣṭhādyāni navarkṣāṇy uḍupatinātītya yujyante//
Here *pauṣṇa* stands for Revatī because it is presided by the god Pūṣan. Likewise *raudra* is Ārdrā.

to 28 and Nos. 1 to 3, the second twelve *nakṣatra*s are Nos. 4 to 15, and the third nine *nakṣatra*s are Nos. 16 to 25 excluding Abhijit (20). This classification has nothing to do with the actual spacing of the *nakṣatra*s. Nor is it based upon any astronomical observation or calculation. Thus it is only natural that Al-Bīrūnī harshly criticized this opinion as 'confused notions' in his *India*.[9]

Second old system SKA gives still another system of *nakṣatra*s. Our text runs as the words of Triśaṅku, the king of the Mātaṅga tribe, answering the questions of Puṣkarasārin, a Brahmin:

> Oh Puṣkarasārin, out of the twenty-eight *nakṣatra*s, six *nakṣatra*s have 45 *muhūrta* conjunction <with the moon>: they are Rohiṇī (2), Punarvasu (5), Uttaraphalgunī (10), Viśākhā (14), Uttarāṣāḍhā (19), and Uttarabhādrapadā (25). Five *nakṣatra*s have 15 *muhūrta* conjunction: they are Ārdrā (4), Aśleṣā (7), Svātī (13), Jyeṣṭhā (16), and Śatabhiṣā (23). Abhijit (20) alone has 6 *muhūrta* conjunction. The remaining <sixteen> *nakṣatra*s have 30 *muhūrta* conjunction.[10]

The unit of time used in this text is *muhūrta*, thirty of which make a day (*ahorātra)*. Here again *nakṣatra*s are divided into three groups, except Abhijit (20) which is regarded as having six *muhūrta* conjunction. The classification in this case is not in the consecutive order.

In the first group (nos. 2, 5, 10, 14, 19, 25) each *nakṣatra* covers 45 *muhūrta*s, or one and a half days. The coverage in time of the second group (nos. 4, 7, 13, 16, 23) is only 15 *muhūrta*s, namely, half a day. The third group (nos. 1, 3, 6, 8, 9, 11, 12, 15, 17, 18, 21, 22, 24, 26, 27, 28) occupies 30 *muhūrta* length, i.e., the space of moon's daily gain.

For easier understanding of the text we refer to a figure (Fig. 1) which was prepared for the *nakṣatra* system of the *Nakṣatrakalpa*. In SKA Bharaṇī (28) was given 30 *muhūrta*s, but in NK it was given only a half day (i.e., Night = 15 *muhūrta*s). The length of Bharaṇī in SKA should have provoked a serious problem because of the following reason. After Uttarabhādrapadā (25), which, as our text says, occupies 45 *muhūrta*s, namely, Day-Night-Day[11] type of NK, the Night-Day sequence should be followed until Bharaṇī. But the next *nakṣatra* Kṛittikā (1) should be of the Day-Night type, because it is followed by Rohiṇī (2) which is, as the text clearly says, covering the length of 45 *muhūrta*s, namely, Day-Night-Day. Thus the principal alternation of Day and Night breaks off here in Bharaṇī. This should have

[9] Trans. by Sachau, ii. p. 86. Weber [1860], p. 309.

[10] SKA p.51 *amīṣāṃ bhoḥ puṣkarasārinn aṣṭāviṃśatīnāṃ nakṣatrāṇāṃ ṣaṇ nakṣatrāṇi pañcacatvāriṃśanmuhūrta-yogāni. tad yathā. rohiṇī punarvasu uttaraphalgunī viśākhā uttarāṣāḍhā uttarabhādrapadā ceti. pañcanakṣatrāṇi pañcadaśamuhūrtayogāni. tad yathā. ārdrā aśleṣā svātī jyeṣṭhā śatabhiṣā ceti. eko 'bhijit ṣaṇmuhūrtayogaḥ. avaśiṣṭāni triṃśanmuhūrtayogāni.*

[11] For the use of capital letters, Day and Night, see footnote 22.

been a serious defect of the otherwise a clever version of unevenly spaced *nakṣatra* system.

In the arrangement of SKA the total length of the twenty-eight *nakṣatra*s is: $6 \times 45 + 5 \times 15 + 1 \times 6 + 16 \times 30 = 831$ *muhūrta*s = 27 days and 21 *muhūrta*s. This length can be expressed by the unit of days as $27\frac{21}{30} (= 27.7)$ days, which is much longer than the mean sidereal month (27.321662 days).

It seems that SKA tried to deal with the fractional part of the sidereal month using Abhijit (20), which is located far toward the north from the ecliptic or from the lunar orbit. It is natural that Abhijit was dropped from the list of the evenly spaced twenty-seven *nakṣatra* system in the later period.

Chinese translations of SKA The two unevenly spaced *nakṣatra* systems found in the *Śārdūlakarṇāvadāna* were well preserved in the two Chinese translations:

(1) *Modengqie jin* (摩登伽經, abbr. Ch_1) by Zhu Luyan (竺律炎) and Zhi Qian (支謙).[12] The date of this text is toward the end of the third century A.D.

(2) *Shetoujian Taizi Ershiba-xiu Jing* (舍頭諫太子二十八宿經, abbr. Ch_2) by Zhu Fahu (竺法護).[13] This translation was made in the beginning of the fourth century.

In Ch_1 three types are called *yue-qian* (月前), *yue-hou* (月後), and *yue-ju* (月俱),[14] which mean, respectively, 'in front of the moon', 'behind the moon', and 'with the moon'.

Buddhist astrologers kept these older systems until quite a later period. A similar account is found in the *Xiuyao jing* (宿曜經, abbr. XJ)[15] of the Buddhist monk Amoghavajra (705–774, Chinese name 不空 Bukong). Although his main system was the evenly spaced twenty-seven *nakṣatra*s, he composed a verse in Chinese which expresses the older system. In this text the first type was translated as *qian-ge* (前合) which means 'ealier conjunction', the second type *dusuicongmu* (犢隨從母) is a literal translation of *vatsānusārī*, and the third type *yuezuoyouhe* (月左右合) is again translation of *yuganaddha*, thus using the simile of a cow and a calf as in SKA.[16]

Table 2 compares the verbal expressions of the old system in the three Sanskrit texts including *Nakṣatrakalpa* (NK), to which I will refer shortly, and two Chinese texts.

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[12]Taisho Vol.21 (No.1300). The description of the 28 *nakṣatra* is found in pp. 404c–405a. The width of each *nakṣatra* is in Column Ch_1 of Table 3 below. Lines 1–6 of 405b give a summary.

[13]Taisho Vol.21 (No.1301). The *nakṣatra*s are described in pp. 415b–416a, summarised in Ch_2 of Table 3. Lines 8–13 of 416a are summary.

[14]Taisho vol.21 (No. 1300), p. 405b.

[15]Taisho Vol.21 (No.1299).

[16]The Sanskrit word *ṛṣabha* for yoga 1 is strange, because *ṛṣabha* is 'ox' while this simile is effective only when the calf is following its mother. This is correctly translated in Chinese as 'mother'.

total number	yoga 1	yoga 2	yoga 3
SKA 28	*ṛṣabhānusārī*	*vatsānusārī*	*yuganaddha*
NK 28	*anāgata*	*atikrānta*	*sama*
BS 27	*anāgata*	*atītya yoga*	*madhya*
Ch_1 28	*yue-qian*	*yue-hou*	*yue-ju*
XJ 27	*qian-ge*	*dusuicongmu*	*yuezuoyouhe*

Table 2 Old system

No.	names Skt	Ch_1	SKA muhūrta	Ch_1 day	Ch_2 muhūrta	NK day
1	Kṛttikā	昴 mao	30	1[17]	30	1
2	Rohiṇī	畢 bi	45	1.5	45	1.5
3	Mṛgaśiras	觜 zi	30	1	30	1
4	Ārdrā	参 shen	15	0.5	15	0.5
5	Punarvasū	井 jing	45	1.5	45	1.5
6	Puṣya	鬼 gui	30	1	30	1
7	Āśleṣā	柳 liu	15	0.5	30	0.5
8	Maghā	星 xing	30	1	30	1
9	P-phālgunī	張 zhang	30	1	30	1
10	U-phālgunī	翼 yi	45	1.5	45[18]	1.5
11	Hasta	軫 zhen	30	1	30	1
12	Citrā	角 jiao	30	1	30	1
13	Svāti	亢 kang	15	0.5	15	0.5
14	Viśākhā	氐 di	45	1.5	45	1.5
15	Anurādhā	房 fang	30	1	30[19]	1
16	Jyeṣṭhā	心 xin	15	0.5	15	0.5
17	Mūla	尾 wei	30	1	30	1
18	P-āṣāḍhā	箕 ji	30	1	15	1
19	U-āṣāḍhā	斗 dou	45	1.5	45	1.5
20	Abhijit	牛 niu	6	1m	6	1m
21	Śravaṇa	女 nü	30	1	30	1
22	Śraviṣṭhā	虚 xu	30	1	30	1
23	Śatabhiṣaj	危 wei	15	0.5	15	0.5
24	P-proṣṭhapada	室 shi	30	1	30	1
25	U-proṣṭhapada	壁 bi	45	1.5	45[20]	1.5
26	Revatī	奎 kui	30	1	30	1
27	Aśvayuj	婁 lou	30	1	30	1
28	Bharaṇī	胃 wei	30	1	30	0.5
	total		27d 21m	27d 16m	27d 21m	27d 1m

Table 3 Width of *nakṣatra*s in the second system[21]

[17] Our text says '12 (double) hours'.

[18] Text: 35. Emended following the variant of No. 25.

[19] Number is missing in the text.

[20] Text: 35. Emended following a variant reading in the Taisho Tripiṭaka.

[21] Zenba [1952] provided a similar table, but I have corrected some numbers.

In Table 3 I have listed the width of *nakṣatra*s of the second system. Similar numbers are given in the the *Dafang deng daji jing* (大方等大集經),[22] but the text is corrupt. Utpala, in his commentary on BS 4.7 (see footnote 7 above), quotes four verses from 'Garga' which convey the same meaning as NK: the six *nakṣastra*s with 1.5 day width (Type 3 of NK) and the six with 0.5 day width (Type 2) are called '*mahākṣetra*' (having large field) and '*svalpakṣetra*' (having small field), respectively, and the remaining fifteen (Type 1 and Type 4) are called '*madhyakṣetra*' (having medium field). Utpala also quotes Brahmagupta's *Brāhmasphuṭasiddhānta*, *Sphuṭagatyuttarādhyāya*, 48–51ab which offer similar meaning to that of Garga and NK.

3 *Nakṣatrakalpa*

The *Nakṣatrakalpa* (NK), which is the first chapter of the *Atharvaveda-Pariśiṣṭa*, seems to belong to the earliest time of the long period of the compilation of the text. This chapter begins with the enumeration of the twenty-eight *nakṣatra*s as is listed in Table 1 above.

In NK 2.1 the number of stars, ranging from 1 to 8, which comprise the *nakṣatra*s, is given. This was also a topic of SKA and its Chinese translations. This implies that *nakṣatra* was regarded as a certain extent of unequal length. Nothing is mentioned about the chief star or the junction star (later called *yogatārā*) nor is given breadth in latitudinal dimension. This longitudinal extent is expressed again in a different manner in NK 5.1–5, namely, by the unit of Day and Night[23] through which the moon stays, except Abhijit (20) which is given only one *muhūrta* ($= \frac{1}{30}$ day).

Type 1 (Day-Night[24]): nos. 1, 8, 9, 17, 18, 24 $(6 \times 1 = 6$ days)
Type 2 (Night[25]): nos. 4, 7, 13, 16, 23, 28 $(6 \times 0.5 = 3$ days)
Type 3 (Day-Night-Day[26]): nos. 2, 5, 10, 14, 19, 25 $(6 \times 1.5 = 9$ days)
Type 4 (Night-Day[27]): nos. 3, 6, 11, 12, 15, 21, 22, 26, 27 $(9 \times 1 = 9$ days)[28]

These 27 days, with the addition of 1 *muhūrta* of Abhijit, make the total length of $27\frac{1}{30} (= 27.0333...)$ days. This value is better than that of SKA and Ch_2, but still

[22] Taisho Tripiṭaka Vol. 13, pp. 274–5. This is an encyclopedic collection full of rich information on Indian Buddhist culture. The title of the original text is *Mahāsaṃnipātasūtra*. The text, consisting of two main parts, was compiled by Sengjiu (僧就): the first part composed by Dharmakṣema and the second by Narendrayaśas between 566 and 585.

[23] 'Day' and 'Night' are my translations of *ahaḥ* and *rātra*, respectively. Thus Day here means 'a half day'.

[24] NK 5.1 *ahaḥpūrva*, lit. 'Day-preceding'.

[25] NK 5.2 *naktaṃbhāga*, lit. '(only) Night part'.

[26] NK 5.3 *rātrīm ubhayataḥ pakṣau bhajante*, lit. 'those which have a Night and two wings (i.e. Days) on both sides'.

[27] NK 5.5 *rātrīpūrva*, lit. 'Night-preceding'.

[28] Cf. Kirfel [1920], p. 140.

it is crude compared with the modern value mentioned above.

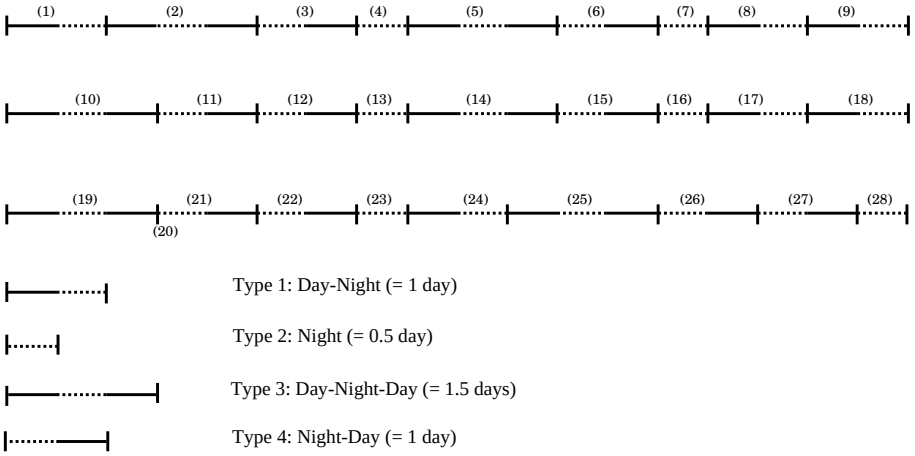

Fig. 1

In order to illustrate this system I prepared a figure (Fig. 1), where Day is drawn by a solid line and Night by a dotted line. It is to be noted that the *nakṣatra*s which are given only fifteen *muhūrta*s are type 2, namely, Night-type and that there is no Day-type *nakṣatra*. Although SKA does not explicitly say that the 15 *muhūrta* type is only Night-type, it should have been presupposed. This is also the case with the 45 *muhūrta* type of SKA. Only the Day-Night-Day type was intended with no regard to the possible Night-Day-Night type. On the other hand, the 30 *muhūrta* type of SKA was divided into the Day-Night type and the Night-Day type in NK.

Although we cannot apply the strict method of modern astronomy, we can roughly estimate the longitudinal lengths of the *nakṣatra*s which were imagined in the primitive system. We should pay attention to the two modifications. Firstly, Abhijit (20), which was given six *muhūrta*s in the older system of SKA, is given here only one *muhūrta*. Secondly, in NK Bharaṇī (28) is given only a half day, in contrast to 30 *muhūrta*s (a whole day, *ahorātra*) in SKA. This modification has settled the problem of the sequence of day and night which we have discussed above. From Table 3 we can also say that although the date of Ch_2 is later than Ch_1, Ch_2 preserves the original feature of SKA better than Ch_1 and that NK of AVPar is closer to Ch_1.

What is interesting is that immediately after this neat classification of *nakṣatra*s, two verses (NK 5.6-7) refer to the older system which we have seen in SKA and BS. The verse NK 5.6[29] summarizes the preceding verses using the term *anāgata*, *atikrānta*, and *sama* (= *sthita*), as shown in Table 2 and NK 5.7 conveys the similar meaning as BS 4.7 quoted above:

[29] *purastādbhāgāny anāgatenopariṣṭādbhāgāgny atikāntenobhayatobhāgāni vartamāne<na> naktaṃbhāgāni samaṃ candreṇa vā*. (NK 5.6)

> Six are in conjunction (with the moon) before (the moon) arrives at them (*nakṣatra*s). Twelve are in fixed conjunction (with the moon). Nine are in conjunction (with the moon) after (the moon) has passed. Thus is shown the yoga.[30]

As we have noted above, Abhijit (20) is not taken into account in this verse. Omission of Abhijit is also found in AVPar Chapter 56 (Kūrmavibhāga),[31] where 27 *nakṣatra*s are divided into nine triads (*trika*s). Thus the number of *nakṣatra*s in NK is not always 28, but sometimes 27. This kind of coexistence of two different systems is not rare in Sanskrit texts which tend to preserve whatever they inherited.

4 Conclusion

The essential tool of the lunar astrology in ancient India is the relation between the moon and the *nakṣatra* in which it stays. But before the introduction of mathematical astronomy from the west, Indian people could not make precise prediction of the moon's place, nor did they define precisely the longitudinal space of each *nakṣatra*. Instead, they tried to express the different spatial length of *nakṣatra*s by the temporal length of *muhūrta*s or day and night through which the moon stays therein. While SKA used the unit of *muhūrta*, NK used the unit of Day and Night.

It was only after the evenly spaced twenty-seven *nakṣatra* system was established that Indian people could prepare the schematic allotment of the the moon's position in order to make astrological predictions. Before that there were several attempts, some of which were recorded in Buddhist texts as well as in the *Atharvaveda-Pariśiṣṭa* and *Bṛhatsaṃhitā*, which are of encyclopedic nature.

As far as the present text is concerned, the date of SKA might not be very old, but the earlier dates of the Chinese translations are established. Thus we can guess that the original SKA belonged to the first or the second century A.D. The *nakṣatra* systems of SKA, its two Chinese translations, and NK of AVPar are very close to each other as we have shown in Table 3, and NK of AVPar shows a slight improvement. Thus I would like to conclude that NK is contemporary to or a little later than the original SKA and its Chinese translations.

The equally spaced 27 *nakṣatra* system is attested in the Ṛgvedic recension of the *Jyotiṣavedāṅga*, of which the initial point of the ecliptic coordinate is Bharaṇī 10°.[32] I wonder whether the text belongs to such an early period as 400 B.C. as Pingree [1981, p. 10] claimed. Anyway it seems that the old *nakṣatra* systems found in SKA, AVPar and BS belong to the tradition of the primitive astrology which is outside the professional mathematical astronomy.

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[30] *<ṣad a>nāgatayogāni sthitayogāni dvādaśa/*
navātikrāntayogāni tathā yogaḥ pradṛśyate// (NK 5.7)

[31] Cf. Maejima-Yano [2010].

[32] In the Chinese text *Dafang deng daji jing* (see above) the beginning of the *nakṣatra*s is Bharaṇī.

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