

## ***Vāstuvidyā of Garga; Review of the Manuscript Vṛddhagarga Samhitā from Nepal***

R.N.Iyengar<sup>1</sup>  
Warija Adiga<sup>2</sup>

### ***Abstract***

*This paper brings to light for the first time, the existence of a hitherto unknown Vāstuvidyā text by Garga, who is one among the eighteen ancient teachers of the subject of Vastuśāstra mentioned in the Matsyapurāṇa. Two manuscripts, one in Newari-Bujimol script and the other in Devanāgarī, of Vṛddhagarga Vāstuvidyā are available in the National Archives of Nepal. The text in 34 chapters, comprising of more than nine hundred verses, as seen from the style, content, and inclusion of only nakṣatra, tithi, muhūrta for deciding auspiciousness of time, must have originated Before Common Era. The text claims to be on Vāstuvidya as expounded by Vṛddhagarga to his son Kroṣṭuki and other disciples. True to this claim, the text touches on several aspects of site selection, town planning, lay out of palace complex, elephant and horse stables and many other topics, with quantified suggestions for important dimensions. The architectural and construction practices described correspond to wood as the primary material. As of now, this text is the oldest available work in Sanskrit wholly devoted to Vāstuvidyā, covering almost all aspects of architectural engineering that was prevalent in ancient India around 500 BCE.*

### **1. Introduction**

*Vāstuvidyā* the science and practice of habitat planning including architectural engineering, has a hoary tradition in the Indian subcontinent. On the literary side, several texts mainly in Sanskrit have come down to us describing the theoretical aspects of this special Indic knowledge system in differing details. These texts are the primary sources for the historian of Indian science, art and architecture and construction technology. Apart from special treatises devoted solely to the subject matter, there are broad based texts such as the Purāṇas that also provide useful information of historical

---

<sup>1</sup> Distinguished Professor (RN.Iyengar@Jainuniversity.ac.in)

<sup>2</sup> Associate (warija@gmail.com)

importance on the ancient society, culture, arts and sciences. One such text namely the *Matsya Purāṇa* before presenting a few chapters on the topic of *Vāstuvidyā*, lists eighteen preceptors; Bhṛgu, Atri, Vasiṣṭha, Viśvakarma, Maya, Nārada, Nagnajit, Viśālākṣa, Purandara, Brahma, Kumāra, Nandīśa, Śaunaka, Garga, Vāsudeva, Aniruddha, Śukra, and Bṛhaspati as the originators of the *Vāstusāstra*<sup>3</sup>. Among these the names of Viśvakarma and Maya, with published texts attributed to them, are more popular. A few other names are known to us through quotations by later authors on the subject. Since academic study of ancient Sanskrit texts on natural sciences is of recent interest, it is possible many are still in manuscript form waiting to be studied and published as source material. For example, among the eighteen listed above, Nārada is famous with works attributed to him on multiple subjects, but his work on art and architecture had remained less known till the *Nārada Śilpaśāstra* available only in manuscript form, was published with introduction, translation and notes (Iyengar 2018). Similar is the case of Garga mentioned above in the Purāṇa.

A sage by name Garga is well known as a composer of several Vedic hymns. Equally well known is the *Garga-samhitā*, a *purāṇa* style text available in print, attributed to the authorship of Gargācārya the family priest of Nandagopa and Yaśodā, the foster parents of Kṛṣṇa in Gokula. It should not be surprising to find several other texts on widely different topics under the authorship of some Garga, which is a family name. In the broad field of natural sciences, we find *samhitā* works attributed to Vṛddha-Garga and Garga styled as *vṛddhagārgīya*, *gārgya*, *gārgīya* in the manuscript (Mss.) catalogues (Pingree 1970). In the Mahābhārata Vṛddhagarga (VG) is famous as an ancient astronomer, knowledgeable about unusual celestial events<sup>4</sup>. Later authors like Varāhamihira, Bhaṭṭotpala, Nīlakaṇṭha cite Garga and Vṛddhagarga extensively as two different authors on astronomy and astrology but reference to works on *vāstuvidyā* is limited to a few stray verses. All the same, one gets the impression, as per the *Matsyapurāṇa* that an ancient work by Garga on *vāstuvidyā* may exist in manuscript form. Thus, it was a pleasant surprise, when among the fifteen manuscripts collected by us

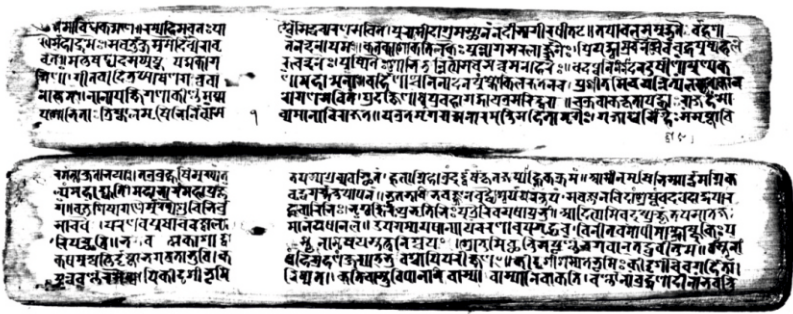
<sup>3</sup> भृगुरत्रिंशच्छिव विश्वकर्मा मयस्तथा । नारदो नम्रजिच्चैव विशालाक्षः पुरन्दरः ॥  
ब्रह्माकुमारो नन्दीशः शौनको गर्ग एव च । वासुदेवोऽनिरुद्धश्च तथा शुक्रबृहस्पती ॥  
अष्टादशैते विख्याता वास्तुशास्त्रोपदेशकाः । सङ्क्षेपेणोपदिष्टन्तु मनवे मत्स्यरूपिणा ॥ (*Matsyapurāṇa* Ch.252 v. 2,3,4)  
<sup>4</sup> यत्र गर्गेण वृद्धेन तपसा भावितात्मना । कालज्ञानगतिश्चैव ज्योतिषां च व्यतिक्रमः ॥ (*Śalya Parvan* 36.15)

catalogued under the subject of *jyotiṣa* as *Vṛddhagarga /Garga /Gārgya /Gārgīya-saṁhitā* (or suffixed *-jyotiṣa*) one from Nepal turned out to be entirely about *Vāstuvidyā*. After astral sciences cultivated since the Vedic period got compartmentalized into *gaṇita*, *horā* and *saṁhitā*, some aspects of *vāstu* are usually included in the *saṁhitā* texts of *jyotiṣa*. The first two divisions refer to mathematical astronomy and astrology respectively. What could not be classified under the above two categories, in the early centuries of the Common Era, was brought under *saṁhitā* which means *compilation*. Thus, we find chapters devoted to *vāstuvidyā* in all the Mss. collected for studying the astral science propounded by *Vṛddhagarga/Garga* before the Common Era. In fact, the fifteenth *aṅga* (section) of the traditional *Vṛddhagārgīya Jyotiṣa* (VGJ) of sixty-four *aṅga* contains some aspects of civic architecture and construction described in ten chapters. The contents of these VGJ manuscripts have been discussed elsewhere (Iyengar *et al* 2019) and hence not repeated here. However, it may be pointed out that Mss. (No.5-1099; A428/27) of the National Archives Library, Kathmandu, Nepal is distinctly different from the others in that it is not in any way a *jyotiṣa-saṁhitā*, but is on *Vāstuśāstra* as an independent subject. This is the first time a work in about thirty chapters on *Vāstuvidyā* by *Garga* as per the *Matsyapurāṇa* has come to light. This text is in the form of answers by *Vṛddhagarga* to questions put by his son *Kroṣṭuki* and *Gautama*, a follower. Since the text by its style and content predates many of the currently popular *Vāstuśāstra* texts, it should be of obvious interest to scholars investigating history of science and engineering in India. This is arguably the most ancient available Sanskrit manuscript solely devoted to the subject of *Vāstuvidyā*.

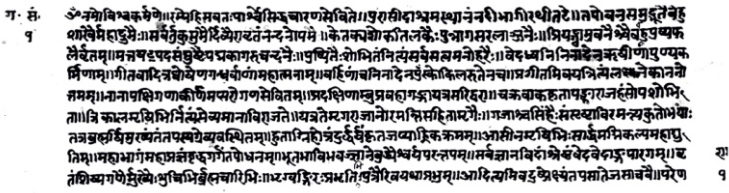
## 2. Two Manuscripts

The manuscript titled *Vṛddhagargasamhitā* bearing No. S-1099 (Reel A 428/27) is listed under *Jyotiṣa* in the National Archives of Nepal. A soft copy of this paper Ms. of 35 folios microfilmed on 5-10-1972, under the Nepal German manuscript preservation project was procured (denoted here as D) for our initial study of works of *Vṛddhagarga*. Since a corresponding or similar manuscript copy could not be located in any of the easily accessible libraries in India, another search was carried out in Nepal for availability of *Garga*-texts in other scripts. With some effort, from the National Archives of Nepal, a digital copy of the Sanskrit text of *Vṛddhagarga* (Reel No.1075/3, palm leafs) listed under *Vāstuśāstra*, in Newari script (denoted here as N) was procured. Surprisingly it turned out that both the Devanāgarī and the

Newari Mss. contain the same Sanskrit text but for minor variations. Our focus in this article is about the technical content of the text and not about writing styles of Indic scripts and their evolution. Nevertheless, to give a feeling to the reader, the first page of the two Mss. is reproduced below. It is easy to see that both start with salutations to Viśwakarma the Vedic deity of creation including all natural forms and manmade art, architecture and crafts.



F1. Facsimile of the obverse and reverse sides of the first folio of the Newari palm leaf manuscript, N.



F2. Facsimile of the obverse and reverse sides of the first folio of the Devanāgarī paper manuscript, D.

With any manuscript the first question that comes to mind is its date of writing. Unfortunately, no dates are mentioned by the copyist. Hence we can only surmise that our copies may be a few centuries old, not earlier than 1500 CE. In this connection the following points are noteworthy. The two scripts are similar and with some effort the two texts can be compared word by word. Firstly, this indicates that the contents of the two texts are identical. Historically it is known that ancient recordings in Nepal took place in the Bhujinmol script, a variant of the Brāhmī. This was succeeded by Devanāgarī from around the 15<sup>th</sup> century. In line with the classical Sanskrit tradition it is found that D introduces '*sandhi*' which N ignores in many places.

Whereas the *avagraha* symbol ॐ that is typical of Sanskrit manuscripts of recent centuries is seen in D, it is conspicuously absent in N. In place of letters that are smudged and hence unreadable in N, the copy of D shows broken lines. The copyist of D has edited N in a few places. For example, the word वन of N in the verse 1.15 is changed to वचन as it should be in the context and the meter. Some errors, such as letters श and स being interchanged in N are rectified in D. There are a few other such alterations also in D. The copy of D is paginated neatly with the abbreviated title and the word रामः in the margin which is again a feature of manuscripts of recent centuries in mainland India also. This is in contrast with the Newari manuscript that carries only the page numbers. At present, limited by the above two copies, comparison of D with N leads us to hold that even though N is the predecessor D is perhaps more accurate and in any case, easier to follow for presenting an overview of the *Vāstuśāstra* text attributed to Vṛddha-garga or Garga by the *Matsya Purāna*.

### 3. Title of the Text

The text is composed in the form of a third party narration of the subject purported to be originally expounded by Vṛddhagarga (VG) in a lecture session or conversation with his followers. The work is specifically ascribed to the authorship of Vṛddhagarga by the narrator in several places, but in a few places only the name Garga is used perhaps to suit the meter of the verse. Since Garga is a family name, without being able to identify a particular person as the author, it is preferable to treat the text as belonging to the School of Garga. The earliest teacher or preceptor of this school is to be taken as Vṛddhagarga (Senior Garga). On each page of D the title is abbreviated as ग सं

<sup>5</sup> वास्तुविद्यायां भूमिपरीक्षा द्वितीयोऽध्यायः (VGV Ch 2, end colophon)



that is *Garga Samhitā*. But the work is attributed within the text to Vṛddhagarga and the subject matter is *vāstu* and not  *jyotiṣa*. The Indian textual tradition recognizes VG and Garga as different ancient authors, as discussed previously (Iyengar *et al* 2019). In our text both the words Vṛddhagarga and Garga are met with, the latter name being just a short form of the first one to suit the meter. In one place (Ch 9.17), only the honourific *vṛddha* is used to indicate the senior speaker that is Garga. Moreover, the questioner Kroṣṭuki in the present text is specifically said to be the eldest son of Vṛddhagarga in VGJ<sup>5</sup>. Kroṣṭuki appears in the earlier sections of VGJ as the prime questioner of the Senior Garga. This synchrony in the two important names between VGJ and the present text tacitly makes the astronomer Vṛddhagarga to have narrated an original *vāstuvidyā* text also. In fact, VGJ has six chapters of *vāstuvidyā* somewhat similar in spirit but not in letter to the current text under review. The colophon at the end of the second chapter in the manuscripts N and D under consideration reads *vāstuvidyāyām bhūmiparīkṣā*. Thus, it is appropriate to name the present text following the above two Mss. N and D from Nepal as *Vṛddhagārgīya Vāstuvidyā* (VGV).

#### 4. Form of the Text

The text is mainly in the popular *śloka* meter (*anuṣṭup*) with eight syllables per quarter. A few other meters are also met with in some places. The scripted VGV is available in 34 chapters, but one gets the feeling that the present redaction, obviously from an older version, is incomplete. The last folio in the Mss. does not have a completion colophon nor do the verses indicate any desired conclusion. On the other hand, the last folio repeats a few verses from a previous chapter on *balikarma* only to break off abruptly in the middle. Another anomaly that can be located in chapter twenty-nine, is where King Sagara is said to be asking Viśwakarma the divine architect to explain about *prāsāda* (mansion/palace). But the immediate next chapter thirty on auspicious asterisms for first entry is clearly attributed to Garga. Again chapter thirty-three on *pratolī* and *kanyāpura*, is in the form of narrating a conversation between Gautama and Viśwakarma. Hence, chapters twenty-nine and thirty-three consisting of a wealth of information about forts and fortified cities, appear to be later additions to the original manuscript.

<sup>5</sup> अथ भगवन्तं अमिततपसं आश्रमस्थमासीनं महर्षिपरिवृतं वृद्धगर्गं ज्येष्ठः पुत्रः क्रोष्टुकिर्नाम संशयं पप्रच्छ ॥ (VGJ, *Rāhucarita*)

Notwithstanding a few other inconsistencies, the first twenty-eight chapters are fairly homogenous in their content and the VGV text offers interesting insights into the very early period of Indian town planning and construction practices. A critical edition of VGV is certainly desirable, short of which, here we briefly review VGV to bring to the attention of Sanskrit scholars, historians and engineers existence of such a work by Vṛddhagarga. Here, first a brief summary of each of the chapters in sequence is presented. Also a few select verses are shown in the foot notes to provide a sample of the style of the text. This is followed by a discussion on the likely date of VGV and other information in the text that is of historical importance.

### 5. Contents in Brief

The VGV manuscript consisting about nine hundred and forty verses has come down to us in thirty-four chapters. A brief chapter wise summary focusing on technical points and not on grammatical irregularities in the language is presented below. The chapter title is as per the end colophon in the Ms. D. It may be noted that D mentions the number of verses in each chapter after the end colophon. But this does not match always with the actual number count of verses, which is given below in brackets after the chapter title.

1. *Praśnādhyāyaḥ* (56). The first chapter starts with a poetic description (v 1-15) of the hermitage of Vṛddhagarga on the banks of River Gaṅgā<sup>6</sup>. This is followed by (v 16-34) a set of about twenty major and thirty minor questions on *vāstuvidyā* posed by Kroṣṭuki to Vṛddhagarga. These include questions on site selection, ground testing, town planning, and location of the king's palace, horse and elephant stables, which were important for the society in the time period of the composition of the VGV<sup>7</sup>. The remaining 22 verses are responses of VG that are elaborated in the succeeding chapters. VG starts with the legend of Viṣṇu felling the demon duo (*daityau*) on earth and says that due to the smearing of their *medas* (marrow) earth got the name *medinī*<sup>8</sup>.

<sup>6</sup> रम्ये हिमवतः पार्श्वे सिद्धचारणसेविते । पुरासीदाश्रमस्थानं नदीभागीरथीतटे ॥ (1.1)  
 आसीनमृषिभिः सार्द्धमग्निकल्पमहाद्युतिम् ॥ महाभागं महाप्रज्ञं वृद्धगर्गं तपोधनम् ॥ (1.11)  
 आदित्यमिव दुष्प्रेक्ष्यं तपसा तेजसा च वै ॥ परेण वपुषा चैव ज्वालयमानं यथानलं ॥ (1.14)  
<sup>7</sup> उपगम्य यथान्यायं चरणवुपगृह्य च ॥ विनीतवचनो धीमान् क्रोष्टुकिः परिपृच्छति ॥ (1.15)  
 कति वा वास्तु नामानि प्रमाणाण्यपि वा कति ॥ द्वाराणि कति चोक्तानि उपद्वाराणि वा कति ॥ (1.20)  
 तलानामुच्छ्रयश्चापि सर्वमाख्यातुमर्हसि ॥ कतरस्मिन्पुरस्थाने राजा वासं निवासयेत् ॥ (1.30)  
 इति पृष्ठः स धर्मात्मा मुनिज्ञानविशारदः ॥ प्रश्नमव्यग्रमन्वर्थं वृद्धगर्गः सभाषते ॥ (1.34)  
<sup>8</sup> एकार्णवे पुरालोके प्रनष्टग्रहभास्करे ॥ जघान तौ महादैत्यौ हरिनरायणः प्रभुः ॥ (1.35)  
 तयोस्तन्मेदसाच्छन्नं सर्वमम्भः समन्ततः ॥ येन नाम्ना वसुमती मेदिनीत्युच्यते बुधैः ॥ (1.36)

This story is easily recognized as the legend of Viṣṇu vanquishing Madhu, Kaiṭabha, who eventually fall down on earth dividing it into several parts<sup>9</sup>. The etymology of the word *medinī* of VGV appears to be from the *Brahmāṇḍa Purāṇa*<sup>10</sup>. This cosmological preamble is similar to but unlike the story of a demon falling face down on earth, as found in the majority of published *vāstu* texts. Interestingly for the necessity of ground inspection and soil testing VG cites the practice of animals examining the ground before selecting their habitat<sup>11</sup>. VG states some eighteen qualities of a good *sthapati* which word refers to a professional with expertise in planning and construction. The chapter ends by advising people to appoint an expert *sthapati* for palace, gateway, hall and residence construction<sup>12</sup>.

2. *Bhūmiparīkṣā* (28½). The chapter starts with land forms and sites unfit for development of a town. Land near forests with thickly grown trees and with canopies grown over others, cemeteries, deep gorges, slushy region should be rejected<sup>13</sup>. Sites near hermitages, funerary monuments (*caitya*) and temples are not preferred. Further testing the site for its porosity by filling a pit with water is mentioned. Testing for smell, colour and taste are also mentioned. All the waste water and rain water falling in a village should be taken out through the town gate. Cities should always be founded by the side of large rivers<sup>14</sup>. A few more instructions, similar to those in other popular *vāstu* texts, are narrated.

3. *Diggrahaṇam* (28½). This chapter is about marking the cardinal directions. It starts with a question by Gautama to VG on how the directions should be decided. First Garga explains the fixing of the gnomon on flat ground, wide enough, with no obstructions due to hills, ramparts, boundary walls and tree clusters. The well-known method of marking the shadow in the forenoon and in the afternoon to draw a straight line indicating the East-West line is explained. Next, the method of identifying the east by observing the rise of *kṛttikā*, *puṣya*, *śravaṇa* asterisms is mentioned. The sight line between

<sup>9</sup> Sṛīmat Bhāgavata (7.9.37); Devī Bhāgavata (1.9.83-84)

<sup>10</sup> मधुकैटभयोः पूर्वमेदसा संपरिप्लुता । तेनेयं मेदिनीत्युक्ता निरुक्त्या ब्रह्मवादिभिः ॥ (Brahmāṇḍa Purāṇa 1.37.2)

<sup>11</sup> पशवोऽपि परीक्षन्ति पृथिव्यास्तु गुणागुणान् । गन्धरूपरसस्पर्शान्परीक्ष्य निवसन्ति च ॥ (1.46)

<sup>12</sup> ईदृशं सर्वसंपन्नं स्थपतिं शास्त्रपारगं ॥ प्रासादादालकद्वारवेश्मकर्म सुयोजयेदिति ॥ (1.56)

<sup>13</sup> असारवृक्षैः कण्टकितं बहुभिश्च द्रुमैर्वृतम् ॥ अवतानैः कपालैश्च वृतं च परिवर्जयेत् ॥ (2.2)

<sup>14</sup> महानदीनां कूलेषु नगराणि निवेशयेत् ॥ (2.27a)



the rising stars *citrā* and *svāti* is also said to indicate the eastern direction. These two methods are same as the ones prescribed in the *Mānava śulbasūtra* and other Vedic texts for orienting ritual halls and fire altars in the E-W direction<sup>15</sup>. Interestingly finding the south and north direction with the help of the *mṛgaśīras* (Orion) constellation is mentioned in verse 17. Marking E-W line following the reflection of sun in a series of water filled pots, and observing flowers that follow sun's direction are also mentioned. This chapter needs further analysis to critically assess the methods mentioned here.

4. *Nagarasaṁniveśaḥ* (47). This chapter is about planning the capital city where the king resides. The selected land parcel is leveled by ploughing and marked into a square grid of 64 x 64 blocks. The first ten verses are about the rituals to be carried out by the king and the priest at the central part of the site on a 8 x 8 grid. After the rituals, the site is divided into blocks of 8 x 8 grids. Seven parts in the front and the central part are for Brahma; that is left open. Verses 16 to 38 are about the planning of the city with a palace, places of worship, elephant and horse stables, roads and settlement of groups of other professional people. Some of the dimensions are provided in terms of length measures *dhanus*, *hasta*, *aratni*, *kiṣku* and *aṅgula*. The relations between the different units are also stated<sup>16</sup>. From the information provided one may form an idea of an ancient city with four gates and king's palace in the central part of the north-east block. *Hasta* (cubit) is specifically mentioned as the basic measure recommended by Garga<sup>17</sup>. A few interesting ancient customs, such as placing icons of *śiva* and *vaiśravaṇa* at the gates<sup>18</sup> and a heavy vessel at the southern border of the town are mentioned<sup>19</sup>.

5. *Rājakulaniveśaḥ* (22). After the planning of the town, the site layout of the king's palace and the residence of the queen are explained in some detail. This is placed on a square plan of measure ranging from 36x36 to 108x108 grid units. This perhaps refers to the area allotted to the palace complex in proportion to the area of the town. The queen's residence is towards the

<sup>15</sup> अन्तरेण चित्रास्वाती श्रवणप्रतिश्रवणौ कृत्तिकाप्रतिकृत्तिके तिष्यपुनर्वसू च प्राग्देशोऽयं युगमात्रोदितयोः पाशाञ्च॥ (Mānavā Śulbasūtra 1.3)

<sup>16</sup> द्विचत्वारिंशाङ्गुलः किष्कु अरत्निश्चैक विशतिः चतुर्विंशाङ्गुलो हस्तश्चतुर्हस्तं धनुः स्मृतम्॥ (4.32)

<sup>17</sup> हस्ते प्रतिसमं वस्तु यथा गर्गस्य शासनम्॥ (4.42b)

<sup>18</sup> शिवं वैश्रवणं चापि द्वारे द्वारे निवेशयेत्॥ (4.23 b)

<sup>19</sup> दक्षिणापरमन्ते तु गुरुं भाण्डं निवेशयेत्॥ संस्थानेषु तु सर्वेषु बलानि विनिवेशयेत्॥ (4.43)

southern part of the layout. Position of doors and openings are indicated by name on the *vāstu* grid. The width and height of the bed room door are specified as 48 x 108 in *āṅgula* measure<sup>20</sup>.

6. *Devatāvibhāgaḥ* (14). This chapter describes the directions and the number of grid boxes allocated to the various deities totaling forty-five irrespective of the number of divisions of the square template. This indirectly refers to verbally locating a particular grid with respect to the centre which is always called *brahma*. This type of naming is common to any layout and the text specially remarks that usually people worship their personal Deva in their homes (v 13). Eight verses are missing in both the manuscripts N and D, indicated in the original by blank spaces after the third verse. The chapter ends by stating the allocation of spaces to the forty-five names of *vāstu* deities. Eight deities occupy one-and-half slots each; sixteen get half slot each; twenty are allotted one slot each, and only one is allotted four slots<sup>21</sup>.

7. *Dvāradevataḥ* (23). The chapter opens with a question by Kroṣṭuki to Garga requesting the latter to explain how many doors of entry are desired for a house and how the deities are reckoned. In answer the teacher says the house has to be divided in four or eight equal parts. (This seems to mean a *vāstu-maṇḍala* grid of 4x4 or 8x8 blocks is assumed). On the site (*puṭa*) the north-eastern space is known as the entry route (*gṛhapraveśamārga*). On each of the four sides of the square grid, starting from east, eight slots are named as per the *vāstu* convention for door positions. The presiding deities at each of such doors are correspondingly stated.

8. *Dvāradaivatakaḥ* (16½). The title appears to mean the door deities already stated in the previous chapter. This chapter is more about the good and bad auguries of having a door in a particular slot on the *vāstu* grid. Sixteen door slots with names are mentioned plausibly referring to the boundary lines on a 4x4 grid.

9. *Dvāraguṇadoṣaḥ* (17). This is a continuation of the previous chapter. The good and bad effects of doors placed in sixteen *vāstu* slots are stated. The names are all different from the ones in the previous chapter. The two chapters taken together perhaps cover both the 4x4 and the 8x8 grid boundary. The chapter ends by declaring that the name of the grids listed is as per *Vṛddha* that is an honorific reference to the teacher Garga<sup>22</sup>.

<sup>20</sup> अष्टचत्वारिंशाङ्गुलं कार्यं विस्तारं तस्य वक्ष्यते ॥ द्वारं तु शयनीयस्य कुर्यादष्टशताङ्गुलम् ॥ (5.12)

<sup>21</sup> अध्वर्द्धभागिनश्चाष्टौ षोडशैवाद्धभागिनः ॥ विशतिपदिकाश्च स्युरेक एव चतुष्पद इति ॥ (6.14)

<sup>22</sup> एतानि नामानि निशम्य विद्वान् यथा यथा शास्त्रनिदर्शितानि । तत्संप्रधार्यांशुविचारयित्वा वृद्धस्य धर्मार्थवचो यथेति ॥ (9.17)

10. *Dvāradoṣaḥ* (17). Alignment errors in openings, wrong location of doors and their ill effects are stated in this chapter. For example, door [frame] bent south bodes death, sloping north leads to loss. Door obstructed by a place of worship leads to severe ill health<sup>23</sup>.

11. *Māpane Naimittikaḥ* (16). The good and bad omens that appear by chance during the measurements and construction of a house are listed in this chapter. Interpretations of sighting and sounds of animals, birds and other unexpected events are described.

12. *Vāstuśāntikaḥ* (8). This short chapter is about the Vedic fire rite at the site before construction. This is prescribed to be done under either the *puṣya* or the *punarvasu nakṣatra* in the bright fortnight. A pit is dug in the *sāvitra muhūrta* (about four hours from sun rise) and sprinkled with honey, ghee, cow's urine. Next the oblations are done. The text is partly in prose, briefly describing the hymns to be used in the ritual. Three offerings are specially stated namely, *vāstune svāhā, vāstupataye svāhā, āyatapataye svāhā*<sup>24</sup>. Next, oblations to the directional deities of the doors in the four directions along with Indra in east, Vaivasvata in south, Varuṇa in west and Soma in north are mentioned as per the Vedic tradition<sup>25</sup>.

13. *Gṛhapraveśakarma* (14). After the *śānti* (appeasement) rites, the first entry procedure to the new building is described. The first verse mentions that the appropriate *tithi, muhūrta, nakṣatra* and *pakṣa* should be selected for the entry<sup>26</sup>. Herbs and other materials used in the entry ritual are listed. The last verse states that the *vāstuśānti* and *gṛhapraveśa* procedure is stated by Kāroṭa Gautama for the benefit of all the four social groups<sup>27</sup>.

14. *Navakarmikaḥ* (17½). The good and bad effects of a new township with special signs and omens are explained, especially for the king. For example, if the eastern part of the city is pleasant and attractive, the king will thrive with his family, and relations<sup>28</sup>. Qualities of a good town in which all the four direction parts are kept clean and beautiful, are said to be beneficial to the

<sup>23</sup> दक्षिणावनते म्युरुत्तरावनते व्ययः ॥ देवागारप्रतिहते अनारोग्यं प्रमारकम् ॥ (10.9)

<sup>24</sup> Among these only the second hymn is found in the Vaikhānasa, Agniveśya and Hiranyakeśi *gṛhyasūtra* texts.

<sup>25</sup> प्राग्भगेभ्यो देवताभ्यो इन्द्राय स्वाहा । दक्षिणद्वारेभ्यो देवताभ्यो वैवस्वताय स्वाहा । पश्चिमद्वारेभ्यो देवताभ्यो वरुणाय स्वाहा ॥ उत्तरद्वारेभ्यो देवताभ्यो देवतासोमाय स्वाहा । द्यौरन्तरिक्षेभ्यो दिवाकरेभ्यो लोकधातृभ्यः स्वाहा ॥ (12.4-8)

<sup>26</sup> गृहप्रवेशं वक्ष्यामि वर्णानामनुपूर्वशः ॥ तिथिमुहूर्तनक्षत्रपक्षादींश्चोपपादयेत् ॥ (13.1)

<sup>27</sup> प्रजानामनुकम्पायै ब्राह्मणानां विशेषतः ॥ अन्येषां चैव वर्णानां कारोटो गौतमोऽब्रवीत् ॥ (13.14)

<sup>28</sup> पूर्वं नगरभागं च रम्यं च प्रियदर्शनम् । राजा विवर्द्धते तत्र सपुत्रबलबान्धवः ॥ (14.6)

king. If the northern part is good looking, the king acquires thousands of cows<sup>29</sup>. The chapter is an advice for the king to keep his city neat and clean without defects in the roads and in the buildings. The good and bad effects are applicable up to a year in the towns to the king and in residences to the house owner. The chapter ends by declaring this to be as per Bhagavān Vṛddhagarga<sup>30</sup>.

15. *Vāstuvaiṅkṛtikāḥ* (21). This chapter is about defects in layout, plan and elevation of buildings. Rectangle, square, pentagonal and circle forms of objects and shapes are considered auspicious<sup>31</sup>. Ten types of defective shapes and plans of houses with corresponding technical names are mentioned. These are *biḍāla*, *kubja*, *dvipada*, *dakṣiṇa*, *vyajana*, *bhinnakarṇa*, *kākapāda*, *trihasta*, *catvara* and *rākṣasa*. In such places even cows do not like to stay as per their natural choice. Normally residences are not more than three storeys in height. King's palace can be four storeys in height<sup>32</sup>. *Aṭṭa* (tower, loft) can be built in four floors but not in five. City gateways are to be constructed with three floors (levels) in *śravaṇa nakṣatra*, taller than this is not beneficial to the citizens<sup>33</sup>.

16. *Vāstumadhye Nirdeśaḥ* (35½). Further suggestions are provided in this chapter on the exterior and interior planning of residences. In the central part of the layout four slots are meant for Brahma. His worship on a square or circular place (platform) brings prosperity to the inhabitants<sup>34</sup>. In the four directions also niches are prescribed for other divinities.

17. *Kūpabhramasthānam* (13). The chapter begins with Kroṣṭuki asking his teacher about places for a water-well and water paths (drains) in a residence<sup>35</sup>. Several alternative positions for a well on the *vāstu* grid are stated by Garga. The north and north east parts of a site are said to be good for a well. Some instructions are given for taking out the waste water also. Exit drains should

<sup>29</sup> बहूनि गौसहस्राणि तदा राजा समाप्नुयात् ॥ पुरस्योत्तरतो भागो यदा दृश्येत शोभनः ॥ (14.12)

<sup>30</sup> देवागारे पुरद्वारे प्रासादे गोलकेषु च ॥ हस्तिशालाश्च शालासु रथशालासु वा तथा ॥  
कोष्ठागारायुधागारे निमित्तं यच्छुभाशुभम् ॥ यदि किञ्चित्प्रदर्शयेत् राज्ञस्त्वदिति निर्दिशेत् ॥  
दिशस्थानं तु राष्ट्रेषु गृहेषु तु कुटुम्बिनम् ॥ संवत्सरपरं सर्वं निमित्तं यच्छुभाशुभम् ॥  
इति होवाच भगवान्वृद्धगर्गो महातपाः ॥ (14.15-17½)

<sup>31</sup> आयतं चतुरस्रं च पञ्चास्रं परिमण्डलम् ॥ समान्येतानि वस्तूनि प्रशस्तानि न संशयः ॥ (15.1)

<sup>32</sup> प्रासादं तु चतुर्भूमिं कारयेद्राजवेश्मनि ॥ गृहाणि तु त्रिभूमीनि न प्रशस्ताततः परम् ॥ (15.14)

<sup>33</sup> त्रिभूमं नगरद्वारं श्रवणेन निवेशयेत् ॥ अत ऊर्ध्वं न कर्तव्यं जनक्षयकरं भवेत् ॥ (15.20)

<sup>34</sup> तस्मिन्प्रशान्ते गृहवास्तुमध्ये देवप्रदेशं विनिवेशयीत ॥ (16.18)

<sup>35</sup> स्थानानि मार्गस्य जलश्च यानि शास्त्रप्रशस्तानि गृहेषु तानि ॥ विज्ञातुमिच्छामि तव प्रसादात्प्रब्रूहि मे प्रश्रमिदं यथावत् ॥ (17.1)

not run through the front door or through the bed room.

18. *Brahmsthāpitaḥ* (14). The chapter starts by stating that before dividing the *vāstu* (site or layout) Brahma should be first established<sup>36</sup>. This concept of fixing the central part before marking the other blocks in a town, site residential or otherwise is a natural way of coordinating the relative positions of the enclosures on the corresponding *vāstu* grid. The text specifies thirteen deity names matching with the grid names which are to be specially worshipped with respect to the central part (*Brahmsthāpita*)<sup>37</sup>.

19. *Vastucedikaḥ* (21). The chapter starts with dividing the layout (town or house) into nine equal parts (3x3) using four threads<sup>38</sup>. The good and the bad portents that can arise on each of the nine divisions are stated. This chapter appears to be by a later hand since the *anuṣṭup* meter is changed to *upajāti*. As a confirmation of possible interpolation, the next chapter has the same title and similar content in the *anuṣṭup* meter, with Garga's name also appearing in the text.

20. *Vastucedikaḥ* (24). This chapter is like a continuation of the previous one. Here the omens are described depending on the damages (ground fissures) at specific locations such as *bhr̥ṅgarāja*, *gandharva*, *jayanta*, *dauvārika*, *sugr̥iva*, *bhallāṭa* etc. on the original *vāstu* grid<sup>39</sup>.

21. *Śālānirmāṇakaḥ* (30). *Śālā* usually means a *hall*; but sometimes it may refer to the enclosures of the hall. Some general suggestions are provided in locating a hall near a water source<sup>40</sup>. [Some text appears to be missing in this chapter]. The hall in the south is governed by the deity *yama*. The dimension of the hall in the west with *varuṇa* as deity will be one-twentieth less than the southern hall. One-twentieth less than this should be the hall in the east with the deity as *āditya*. One-twentieth less than this should be the northern hall. Near forests halls are constructed in three blocks. Timber of fruit bearing trees are recommended to be used in construction combined with other materials. Unburnt silt, soil collected from fire altars and also sticks and mud blocks picked up from lakes can be used. Usable materials should be briefly

<sup>36</sup> सर्वेषामेव भूतानां ब्रह्मभूता हि देवताः ॥ ब्रह्माणं प्रथमं स्थाप्य ततो वास्तुं विभाजयेत् ॥ (18.1)

<sup>37</sup> ब्रह्मपुरभागोक्तास्तु देवाहोते त्रयोदश ॥ अभ्यन्तरगृहस्यैव गर्गस्य वचनं यथा ॥ (18.14)

<sup>38</sup> वस्तुप्रमाणं नवधा विभज्य सूत्रैश्चतुर्भिः कुशलप्रदिष्टैः ॥ शुभाशुभं तत्र विनिर्दिशेत् छेदं विबद्धं द्विविधं यथावत् ॥ (19.1)

<sup>39</sup> यदाग्निदेशे दीर्येत् धनलाभमुपस्थितम् ॥ जायते च तदा तीक्ष्णे कीर्त्या युक्तो यथोशनाः ॥ (20.1)

भल्लाटे पर्वमाप्नोति दीर्णमात्रे नरः स्वयम् ॥ पुत्रलाभं च न चिरादिति गर्गस्य शासनम् ॥ (20.17)

<sup>40</sup> मातरः सर्वभूतानां प्रमाणसुखदाः सदा ॥ मातृस्थानं च तत्रैव कुर्वीत सलिलाश्रये ॥ (21.1)

stated since there are alternative designs<sup>41</sup>.

22. *Svaniveśaḥ* (31). This chapter is about the private residences of people of the four social groups. The chapter begins by recommending cows to be tethered first, on the site, for a few days. Pegs of same size, straight and devoid of defects are used in marking the corners. Measurement should be done by a *sthapati* who is adept in fixing the corners<sup>42</sup>. The measurement (marking) is done in the *uttarāyaṇa śuklapakṣa* under an auspicious *tithi* and *muhūrta*<sup>43</sup>. A new residence can be built or an old one can be renovated. The eastern and northern parts of the roof beams are known as the door-heads (*dvāraśirāṇi*). The east direction is decided by the stars *citrā*, *svāti*, *śravaṇa*, *dhaniṣṭhā*, *krittikā* when these are above the horizon by the height of a *yuga* (yoke of a cart that measures about 86 *āṅgula*)<sup>44</sup>. Old timber for construction should be kept immersed in water for seven nights. Let the water to ooze out and then it is coated with bee wax<sup>45</sup>.

23. *Dvāracchedaḥ* (24). This chapter is about the scenario of using new and used timbers for doors. A common rule to take care of mixed usage of construction materials cannot be given. Hence broad-guidelines are suggested for setting up the doors. The doors should align in one direction, without any hindrance in the sight lines between. Verses 9-11 give the dimensions of the city gate. The direction of the bedstead of the four social groups is mentioned. The headrest of the Kṣatriyas, Vaiśyas, Śūdras and the Brāhmaṇas will be respectively towards east, south, west and north<sup>46</sup>. The quality of water coming out of soil of different colours is listed in verses 14 and 15<sup>47</sup>.

24. *Chāyālakṣaṇam* (8). This chapter list out the ways to understand the good and bad portents based on the shapes of shadows that appear on the different *vāstu* grids of a house<sup>48</sup>.

<sup>41</sup> वस्तु संक्षेपेण ब्रूयात्कृतस्य च विकल्प्यते ॥ (21.7b)

<sup>42</sup> सर्वकर्णगतं कुर्यान्महल्यल्पेव वस्तुनि ॥ मापनं स्थपतिः कुर्यात्कर्णसंस्थानकोविदः ॥ (22.6)

<sup>43</sup> पूर्वाह्ने वा पराह्ने वा मुहूर्ते तिथिपूजिते ॥ कारयेच्चोदगयने शुक्लपक्षे सुमापनम् ॥ (22.7)

<sup>44</sup> चित्रास्वात्यां धनिष्ठायां श्रवणा कृत्तिकासु च ॥ एतेन गृह्यते प्राची युगमात्रेण दर्शयेत् ॥ (22.17)

<sup>45</sup> पुराणदारुमुदके सप्तरात्रं निधापयेत् ॥ उदकं दुह्यतां तेन मर्षयेन्मधुसर्पिषा ॥ (22.20)

<sup>46</sup> प्राक्शिरात् वीरशयनात् क्षत्रियस्य विधीयते ॥ दक्षिणाशीर्षशयनं वैश्यस्य तु विधीयते ॥ (23.12)

प्रत्यक्शीर्षः स्वयं शूद्रः सर्वं जनपदी भवेत् ॥ उदक्शीर्षं तु कर्तव्यं शयने ब्राह्मणस्य तु ॥ (23.13)

<sup>47</sup> नीले कषाय मधुरमविकर्णजलं स्मृतम् ॥ लौहित्येभ्यस्तु मधुरं पाण्डुरं वर्णमादिशत् ॥ (23.14)

सिते कषायं पानीयं मधुरं कृष्णभूमिषु ॥ कपिले क्षारिकं विन्द्यादनिर्देशस्तु पीतके ॥ (23.15)

<sup>48</sup> अथकर्ममनिष्टस्य तथेष्टस्य च दर्शनम् ॥ गृहे दैवतनिर्देश्यं फलं वास्तुपताविह ॥ (24.1)



25. *Navagr̥ha-vikarma* (41). The title of this chapter indicates that it is about anomalies in a newly constructed building. But the first verse is a reference to a particular era when the four social groups were formally recognized. As the manuscript is from Nepal we speculate that this refers to such recognition by a ruler of Nepal. The era is mentioned as *mālībhava yuge*<sup>49</sup>.

If we reckon the word *mālībhava* as a number word as per the *kaṭapayādi* system, this translates to 4435 Śaka year corresponding to 1334 CE. [This is a tentative interpretation, but the lack of homogeneity in the contents of the chapter indicates that some of the verses might have been added at different dates]. The chapter mentions good and bad omens that may be visible in towns and villages. The chapter is a mix of many social and religious information including portents in cremation grounds, omens in daily life and temple icons<sup>50</sup>, but in no particular order. Mention of icons of Rāma, Kṛṣṇa, Soma, Śiva, Skanda and restoration of damaged temples is interesting. However, the overall style of the text with hierarchical appellations of officials points to this chapter being a late addition.

26. *Ucchrayanikaḥ* (25). This chapter gives some general suggestions about construction of a building by raising the pillars first. This chapter begins with preparation of the ground by digging, filling up with soil and stone pieces followed by ramming the place to make it level and hard. The material of the pillars is said to be *aśmasāra* that is usually interpreted in lexicons as metal. But this could be a material like lime stone or just rough cut stone. Wooden columns (*vanaspati*) are specifically mentioned. The word *gajapāda* refers to heavy elephant-foot compactors or ramming the ground by real elephants<sup>51</sup>. The first placement of the column is done under an auspicious combination of *tithi*, *nakṣatra* and *muhūrta*. Here again week days are not known for auspiciousness<sup>52</sup>.

27. *Sarvavarṇānām* (49). The end colophon of this chapter reads *ityeṣā gargakṛte vāstuvidyā prajānām sarvavarṇānām*. The name of Garga appears

<sup>49</sup> अभ्युत्पन्नं चतुर्वर्णं गते मालीभ(ध?)वे युगे ॥ अविधेयो वशं याति राज्ञः कीर्तिर्विवर्द्धते ॥ (25.1)

<sup>50</sup> देवायतनकर्मेषु निमित्ता साध्वसाधु च ॥ वक्ष्यामि निखिलेनैव प्राणिनां यदुपस्थितः ॥ (25.14)

रामे कृष्णे च सोमे च शिवे स्कन्दे हुताशने ॥ ब्रह्मणि काश्यपे चैव इन्द्रे वैश्रवणे तथा ॥ (25.15)

यक्षनागसुपर्णेषु मातृषु श्वेतवाहने ॥ शक्तिध्वजापताकासु पाषण्डायतनेषु च ॥ (25.16)

प्रादुर्भवि प्रनष्टस्य भूत्वा पूर्वेऽथवा पुनः ॥ जीर्णे वाप्यपकर्षित्वा यद्यत्कुर्वात्सुनर्भवम् ॥ (25.17)

<sup>51</sup> पांसुना कल्पयेद्भूमिं सशैलपिटकन्विताम् ॥ घातयेद्गजपादैश्च खातकाः सर्वतः समम् ॥ (26.3)

<sup>52</sup> प्रशस्ते तिथिनक्षत्रे मुहूर्ते चाति पूजिते ॥ सर्वतः संवृतं कृत्वा वस्तुमध्ये निवेशयेत् ॥ (26.5)

five times in this chapter as *gargasya śāsanam*. The text describes the negative effects on the occupants when the *vāstu devatās* are disaffected<sup>53</sup>. This applies to all the four social groups and hence the chapter strictly orders (*śāsanam*) citizens in the name of Garga to maintain their residences properly. Large numbers of portentous effects are described pertaining to types of defects in planning and construction. For example, if door after door is impeded or intruded the *āditya devatā* gets disaffected and the owner becomes poor<sup>54</sup>. The chapter ends by advising the occupants to propitiate the deities daily by various offerings.

28. *Prāsādavibhāgaḥ* (32½). This chapter as per the title is about classification of mansions that would include palaces. Four types of plans, namely rectangle, square, circle and *svāstika* are stated to be the regional styles. Square plan is popular in Magadha; circular plan is followed in Surāṣṭra. Rectangular plan and *svāstika* are practised in Kosala and Avanti regions respectively. All these are defined by the way of assembling the pillars<sup>55</sup>. Further numerical details of the four types are mentioned which are not easy to follow due to complexities in interpreting the numbers. There are several terms not used in their usual meaning. For example, the word *kṣaṇa* is used not in the temporal sense of time but in the special sense of middle or centre<sup>56</sup>. Similarly the word *koṭi* is used not as a large number but in the sense of angle/corner/vertex<sup>57</sup>. The material that is mentioned with shaping instructions is *dāru* that is timber<sup>58</sup>. The overall thrust of the chapter appears to be suggestions to carpenters about making timber columns and linking them at ground level and at a height with *nemi* (rim/circumference) that perhaps refers to cross beams of the framework. More than the technicalities, it is interesting to note that four regional styles are recognised that covers large parts of northern India of ancient times. Magadha, Kosala and Avanti

<sup>53</sup> यथा यथा विरज्यन्ति येन येन च देवता ॥ श्रृण्वते निखिलं सर्वमेवमेव यथा यथा ॥ (27.1)

<sup>54</sup> द्वारे द्वारे तु संविद्धे कुटुम्बीनिर्द्धनो भवेत् ॥ आदित्यस्तु तथा युक्तो वेश्म तस्य विरज्यते ॥ (27.6)

<sup>55</sup> आयतं चतुरस्रं च वृत्तं स्वास्तिकमेव च ॥ चतुर्विधाः स्युः प्रासादाः कर्मकल्पविपर्ययः ॥ (28.1)

चतुरस्रं च कर्तव्यं मगधेषु यथाविधि ॥ वृत्तकार्यो सुराष्ट्रेषु प्रासाद इति मे मतिः ॥ (28.2)

कौशलेषु तु कर्तव्यः स्वस्तिको नात्र संशयः ॥ आयतः कल्पतो युक्तः प्रासादस्त्ववन्तिषु ॥ (28.3)

एते सर्वे तु विधयः पादतः परिनिष्ठिताः ॥ पादसंकलनादेव युक्तो विधिविपर्ययः ॥ (28.4)

<sup>56</sup> क्षणेनैव प्रवक्ष्यामि विभागेन यथाविधि ॥ यस्य यस्य तु यत्कार्यं क्षणं पदविभागशः ॥ (28.8)

<sup>57</sup> मागधे किष्कुकोटीयं कारयेत्पादमन्ततः ॥ (28.10a)

<sup>58</sup> पञ्चभागफलं कुर्यात्तेन दारूमहीयते ॥ स्कन्दकं फलतः कुर्याच्चतुरस्रेण संमितम् ॥ (28.20)

(Ujjayini) are well known. But Surāṣṭra is not to be mistaken for modern Saurāṣṭra. In ancient times Surāṣṭra was a well governed state probably in the present Kathiawad region (Law 1920, Agrawala 1953).

29. *Prāsādasūtraḥ* (100). This is the longest chapter in the manuscript, longer than the average length of the earlier chapters of VGV. This is perhaps an indicator of later addition. The first four verses introduce the subject of *prāsada* (palace/mansion) and *torāṇa* (arched gateway) by Viśvakarma responding to the request of King Sagara<sup>59</sup>. The third verse is quite clear that the material of construction is wood. There are many classifications depending on the shape like square, octagonal, circular, sixteen sided; also based on the breadth, width and height. Primarily there are 14 types, increasing to 126 including variations in the number of floors. Verse 10 to 14 list fourteen types named after their form (*rūpa*) as *rucaka*, *maṇḍalākāra*, *phalakasthita*, *jīhapūrṇa*, *rājāvīkrānta*, *gajayūthaka*, *puṇḍarīkākṣa*, *puṅgata*, *siṃhavīkrānta*, *śoḍaśadvāraka*, *nandyāvarta*, *sarvatobhadra*, *svāstika*, and *dikkumbhika*. Verses 15 to 46 describe each of the above in greater detail. Several architectural terms such as *kaṇṭaka*, *piṭaka*, *niryūha*, *śrṅga*, *torāṇa*, *śrṅkhalā*, *pracīraka*, *garbhagr̥ha*, *kaṇṭhika* that are generic features common to all the fourteen types are used. Some ratios and proportions are also mentioned, the meanings of which have to be worked out to verify their internal consistency. The form of the *prāsāda* is differentiated by the number and location of the gateways, turrets, domes, corners, projections, cornices etc. The *garbhagr̥ha* or *garbhāgāra* is the living room or enclosure which is generally at the center and can be of square, octagonal and duo-decagonal plan<sup>60</sup>. Some specialty of King's *prāsāda* is mentioned. This may have a *śaila-garbhagr̥ha* (rubble stone enclosure) with a side tunnel (*surāṅga-pārśva*) and enclosed by a marshy (*kaccha*) moat. The palace can be in three, five or ten floors depending on the ground conditions<sup>61</sup>. Verses 56 to 60, briefly state the steps and staircases of the palace. Verses 61

<sup>59</sup> राजा धर्मशुचिः श्रेष्ठः श्रीमान्सत्यः शुचीरुचिः ॥ इक्ष्वाकुवंशप्रवरः सगरो नृपसत्तमः ॥  
सर्वशिल्पी कृतां मुखं विश्वकर्माणमब्रवीत् ॥ भवाच्छासार्थं कुशलः प्रासादगृहकोविदः ॥  
दारूकर्माणि यत्रैवख्यातस्तैलोक्य संमतः ॥ प्रासादनाम रूपं च संस्थानं च यथा विधि ॥  
तोरणानां विधानं च विधिवद्वक्तुमर्हसि ॥ (29.1-4a)

<sup>60</sup> पिटके तोरणे द्वे द्वे द्वि चत्वार्यपचीरके ॥ कुटुम्बिनो गर्भगृहं कोणद्वादशमाचरेत् ॥ (29.31)

<sup>61</sup> त्रिभूमं पञ्चभूमं वा दशभूमं च कारयेत् ॥ प्रासादानां यथाभूमि स्वच्छन्देनाभिवर्धते ॥ (29.57)

to 78 are about the general form, structure, decorations and proportions to be adopted for *torāṇa* (entry door or gateway). Three types of *torāṇa* named as *māgadha*, *gāndhāra*, and *ardha-māgadha* are briefly described in the remaining verses.

*Note: Between the end colophon of this chapter and the first verse of the next chapter, manuscripts N and D have two stray sentences shown below*<sup>62</sup>.

30. *Nakṣatrayogaṃ* (28). This chapter lists the portents for a city founded under each of the twenty-seven *nakṣatra*. All the 27 asterisms starting from *kṛttikā* ending with *bharaṇi* are listed. City founded on *kṛttikā* shines with wealth, gold, silver and lights<sup>63</sup>. Under *ārdrā nakṣatra* there will be availability of fish, meat and other foods. But men folk will be cruel and people generally foolish<sup>64</sup>. On similar lines the good and bad effects of the founding *nakṣatra* are stated. Under asterism *bharaṇi*, the city dwellers will be given to quarreling and unhappy due to wicked persons<sup>65</sup>. The chapter ends with the advice that one should select an auspicious *nakṣatra* for founding a city as per the words of Garga.

31. *Balikarma* (17). This chapter prescribes the type of food to be offered (*bali*) during *grhapraveśa* (first entry) to please the different *vāstu devatā* at their respective grid locations. The *vedi* (fire altar) should be in the *agni-grha* (fire-room). The *homa* (fire ritual) be done in the *vedi* and not at the centre part of the site<sup>66</sup>. About thirty offerings of different food items are mentioned in this chapter.

32. *Balikarmika* (10 ½). This chapter is also about *bali* offerings, most likely as an extension of the previous chapter. However, several of the prescriptions are of four monthly offerings<sup>67</sup>.

33. *Pratolīsūtra* (68). The chapter is introduced in the manuscript as a dialogue between Viśwakarma and Gautama. This chapter gives technical information about special construction features of *kanyāpura*, *godhāmukha*

<sup>62</sup> होममन्त्रा द्वात्रिंश कुलदेवतानाम अभिमन्त्र्य जुहुयात्॥हुताशन पृथिवीति च स्वाहा॥०॥

<sup>63</sup> कृत्तिकासु निविष्टं तं नगरं दीप्यते श्रियम्॥प्रभूतरुक्मरजतं ज्वलनानां च निर्दिशेत्॥(30.1)

<sup>64</sup> आर्द्रायां मत्स्यमांसं च भक्ष्यभोज्य धनानि च॥भवन्ति क्रूरपुरुषा मूर्खप्रायजनं पुरः॥ (30.4)

<sup>65</sup> भरण्यां तु निविष्टे तु नगरं कलह प्रियम्॥ दुःखशीला नराः सर्वे वसन्ते पुरुषाधमाः॥(30.27)

<sup>66</sup> ये पूर्वमुक्तसंभारा यथा न्यायं परीक्ष्य च ॥गृहप्रवेशने तत्र सर्वार्थमुपकल्पयेत्॥(31.1)

वेदिमग्निगृहे कुर्याद् द्वारमूलसमन्ततः॥वास्तुमध्ये न होतव्यं वेद्यां होतव्यमुच्यते॥(31.2)

<sup>67</sup> दौवारिकेषु सुग्रीवे चातुर्मासे बलिं हरेत्॥सुरां चैवचमांसं च असुराय बलिं हरेत्॥(32.6)

and *pratolī*, used in ancient cities for protection against external attacks<sup>68</sup>. It is stated that *kanyāpura* is specially meant to ward off enemies<sup>69</sup>. This text has recognizable synchrony with chapters 2.3 and 2.4 on forts and fortified cities of Kauṭilya's Arthaśāstra<sup>70</sup>. The *kumārīpura* of Kauṭilya is perhaps same as *kanyāpura*. The present text gives more details and measurements about *godhāmukha*, which is an intentionally designed geometrical feature of a long snout-like entry passage in the fort. Distinctive features of the *pratolī* that forms the front security gate built in two or three levels with concealed steps are also mentioned. However, from the context and the contents, this chapter is unconnected with the original *Vāstuvidyā* of Vṛddhagarga. In comparison with the earlier *nagara sanniveśa* (Ch.4) and *rajakulaniveśa* (Ch.5) the present chapter *pratolīsūtra* is too sophisticated and hence can be taken to represent a later stage in the development of *Vāstuvidyā*. The primary text of this chapter as attributed to the authorship of Viśwakarma is yet to be traced.

34. *Dvāranirdeśikāḥ* (31). This chapter lists out omens based on the grid positions of the doors. In the end it says, if one hears about even small faults in the doors, one should rectify them for prosperity. The name of Garga does not appear in this chapter. Since doors are discussed already in chapters 7, 8, 9 and 10 this chapter reads out of place.

The last folio of the manuscript after Chapter thirty-four has a few lines repeated from *balikarma* (Ch.31). With this the manuscript ends abruptly.

## 6. Discussion

The *Vṛddhagarga Samhitā* manuscript from Nepal reviewed in this study is of evident historical interest in tracing the growth of habitat planning, architecture and civil engineering in India. The review presented above brings out the appropriateness of naming the work as *Vṛddha-gārgīya-vāstuvidyā* (VGV) as supported by the end colophon of the second chapter. Though there are two chapters ascribed to Viśwakarma, the primary author is said to be Vṛddhagarga. Thus the present VGV text can be taken to be by the ancient school of Garga as mentioned in the Matsya Purāṇa. This is arguably

<sup>68</sup> कन्यापुरेति प्रथितं पदेतत् पुरेषु राष्ट्रेषु तथा गृहेषु॥तस्य प्रमाणं च विधिक्रियं च श्रोतुं प्रयच्छे भगवान् प्रसादात्॥(33.3)

<sup>69</sup> तमुग्रतेजामृषिमिन्द्र कल्पं शुश्रूषमाणं भगवानुवाच॥शृणुष्वशत्रुप्रतिघातनार्थं कन्यापुरं युक्तविधिप्रमाणम्॥(33.4)

<sup>70</sup> प्राकारसमं मुखं अवस्थाप्य त्रिभाग-गोधामुखं गोपुरं कारयेत्॥ प्राकारमध्ये वापीं कृत्वा पुष्करिणीद्वारम् । चतुः-शालं अर्ध-अन्तरं साणिकं कुमारीपुरम् । मुण्ड-हर्म्य-द्वि-तलं मुण्डक-द्वारम् । भूमि-द्रव्य-वशेन वा निवेशयेत् ॥(Arthaśāstra 2.3)

the oldest available text solely devoted to *vāstuvīdyā* the subject of habitat planning and settlement in India. It is not possible to precisely date the composition of the work, but can be safely said to have originated before the Common Era. A significant pointer to this claim arises from the *nakṣatra* list starting from *ṛttikā* as in the Vedic period and attribution of auspiciousness to the day and time for starting a new work. Specifying this in terms of five time parameters (*pañcāṅga*) *nakṣatra*, *tithi*, *karaṇa*, *muhūrta* and *vāra* has been the practice starting from around 400 CE. The last parameter namely *vāra* refers to the seven week days, which was not in vogue from Vedic times till the early centuries of CE. We see that ancient post Vedic texts such as the Arthaśāstra, Nāṭyaśāstra of Bharata, Nāradaśilpa, have no citations to weekdays. Similarly, the Atharvaveda Pariśiṣṭa, astral works of Parāśara and Vṛddhagarga keep *ṛttikā* at the head of the *nakṣatra* list and make no reference to week days. The present text VGV refers to auspiciousness of time in a day in terms of *nakṣatra*, *tithi* and *muhūrta*. Even the fourth *tithi* related *karaṇa* is not referred, unlike in VGJ the Jyotiṣa text of Vṛddhagarga. Thus, the contents of this work can be, beyond reasonable doubt, assigned to a period before the Common Era. It is generally accepted that the Vedic *Śulbasūtra* texts were composed before 500 BCE. Our text for marking the E-W line prescribes alignment with rising stars which is same as the method described in the *Mānava Śulbasūtra*. This also makes a case for VGV to have originated around 500 BCE.

As per the text the initial composition of VGV is said to have happened in the hermitage of Garga on the banks of River Bhāgīrathi that is same as Gaṅgā. However, the place of compilation in its present form appears to be the classical Magadha region, which included or overlapped with present day Bihar, Uttara Pradesh and Nepal. In synchrony with this, the other historically attested regions Kosala, Gāndhāra, Surāṣṭra and Avantī are mentioned.

Among the few proper names appearing in the text, the Vedic *vāstuśānti* rituals of chapters 12 and 13 are associated with Kāroṭa Gautama. Here, the first name Kāroṭa refers to the birth place of Gautama, to discriminate him from others with the same family name Gautama. This place is known as Karoṭi (Karoṭa, Kāroṭi) from the period of the later Vedic Brāhmaṇa literature (Śatapatha Brāhmaṇa IX.5.2) as a place where a fire altar was built in more ancient times by Tura Kāvāṣeya. This place should have been quite famous in ancient times to have been specially mentioned in the Vedic and in the present



VGV text. Bharadwaj (1986) identifies Karoṭa with the village having a mound of the same name near Diplana Railway Station, Rajasthan. By and large the cultural picture that emerges from the text, matches with classical India of middle first millennium BCE. The rituals associated with house construction mentioned in VGV are derived from more ancient Vedic practices, some of which can be verified even now in the available *gr̥hyasūtra* texts.

### 7. Special Features

There are several specialities in the VGV text, which can come out only after the text is edited critically for its technical content. The lone available manuscript is incomplete and hence parts of the present review is either incomplete or tentative. Nevertheless a few specialities can be pointed out. The text unambiguously refers to the subject it expounds as *vāstuvidyā* and not as *vāstuśāstra*. With renewed interest among the general public in the ancient science and engineering of classical India, it may be noted here that VGV is not prescriptive but leaves much to the *sthapati* to innovate. The text nowhere claims it to be a part of *Jyotiṣa* or as one among the traditional sixty-four arts. This brings up the question of the relation between the present *vāstuvidyā* text (VGV) and the *Jyotiṣa* text (VGJ) both attributed to Vṛddhagarga. The latter text (Iyengar *et al* 2019, 2020) explains cursorily *vāstuvidyā* in ten chapters of varying length, totalling 187 verses. The subject covered overlaps in part with VGV particularly when doors and entry gates are discussed. Even when the topics are similar, the VGJ text is entirely different but in some places claims to say the opinion of Vṛddhagarga. The end colophons in VGJ mention the *vāstuvidyā* chapters as belonging to *Gārgīsamhitā*. There are also differences in the construction materials cited for use. Whereas VGV almost exclusively refers to timber as the material, VGJ mentions stone in addition to timber as construction material. Neither of these refers to lime plaster or any other binding material. Overall, between the two texts attributed to Vṛddhagarga, the Nepal manuscript clearly carries more ancient and hence information originally due to the school of VG. The *vāstuvidyā* section in VGJ appears to be a later composition by the followers of Vṛddhagarga, to make up for the sixty-four *aṅga* (limbs) of the *astral science* of their time.

Several methods listed in VGV for fixing the E-W direction are in contrast with other texts that prescribe only the gnomon and the shadow method. Using the stars of Orion constellation to mark the north-south line is a novelty

not found in other known texts.

The 29<sup>th</sup> and the 33<sup>rd</sup> chapters, though not by Garga, are of interest as they introduce special architectural features *torāṇa*, *kanyāpura* and *godhāmukha* not discussed in the earlier chapters. The *prāsāda* and its various forms with mention of dimensions needs a separate study. The word *kanyāpura* is generally interpreted as women's apartment in the palace complex. But our manuscript is clear that it is meant for defending against external attacks. Thus, we have to take this as a technical word and not in its etymological sense. This appears to be a special enclosure having an approach styled *godhāmukha*, which in turn is a long vestibule or passage, compared to the snout of a garden lizard. The *kanyāpura* is perhaps same as the *kumārīpura* of the Arthaśāstra that appears in connection with the design of forts (see foot note 70). Schlingloff (2014) in his monograph on fortified cities, presents a comparison between the Arthaśāstra descriptions with the plan of a city gate excavated at Śiśupālgarh to bring out the architecture of *godhāmukha* and the adjoining stairwells near the *pratolī*. Chapter 33 of our text on *Pratolīsūtra* has more details with dimensions that deserves a separate study. It may be noted here that both the Brahmāṇḍa and the Vāyu Purāṇa know about *kumārīpura* as part of a fort surrounded by a moat or trench with flowing water<sup>71</sup>. Relation between the *Vāstuvidyā* of the Purāṇa texts and the work of Vṛddhagarga would be an interesting topic for future studies.

## 8. Conclusion

A brief review of the contents of the manuscript listed as *Vṛddhagarga Samhitā* (No.5-1099; A428/27) of the National Archives Library of Nepal, classified under *Jyotiṣa* is presented in this article. It is found that this is a rare manuscript that has been transcribed from a previous version of the same Sanskrit text available in Newari script in the above Archives. The text is not a work on astronomy or astrology but as of now the only available ancient text ascribed to Garga or Vṛddhagarga, one among the eighteen ancient teachers of *Vāstuvidyā* as per the *Matsyapurāṇa*. The nature of the work and the society in which the contents can be placed is in synchrony with the early centuries prior to the Common Era. Absence of week days and description of wood as primary construction material are pointers to the work to be an

<sup>71</sup> सोत्सेधरंध्रप्राकारं सर्वतः खातकावृतम् | रुचकः प्रतिकद्वारं कुमारीपुरमेव च ||  
द्विहस्तः स्रोतसां श्रेष्ठं कुमारीपुरमञ्जतान् | हस्तस्रोतो दशश्रेष्ठो नवहस्तोऽष्ट एवच || (Brahmāṇḍa Purāṇa 1.7.103-104)

important source for tracing the historical development of architectural engineering in greater India. Critical edition of the *Vṛddha-Garga-Vāstuvidyā* is a desideratum, but this depends on the availability of other versions of the same text, for which a dedicated search in the manuscript libraries within India and abroad is necessary.

### 9. Acknowledgements

The study reported here is carried out under the grant-in-aid project AICTE/IKS/CENTER-1/2021-22/02 under the IKS Center Scheme of the Ministry of Education, Govt. of India. The authorities of the Nepal Archives Library are thanked for providing us the digital copies of the two manuscripts cited in the paper as N and D. Thanks are due to Sri Tuladhar, (Kathmandu) for helpful discussions on the indigenous scripts of Nepal.

### 10. References

1. Agrawala V.S., (1953) *India as known to Pāṇini*, Publ. Univ. of Lucknow, Lucknow.
2. Bharadwaj O.P., (1986) *Studies in the Historical Geography of Ancient India*, Sundeep Prakashan, Delhi.
3. Iyengar R.N. (2018) *Nārada Śilpaśāstra*, Jain University Press, Bangalore
4. Iyengar R.N., Sudarshan H.S., Anand V (2019, 2020) *Vṛddhagārgīya Jyotiṣa* (Parts 1 to 4)  
*J. of Academy of Sanskrit Research*; Melkote, Vol. 25.
5. Law B.C (1984) *Historical Geography of Ancient India* (Indian Edition) Munshiram Manoharlal Publishers, Delhi.
6. Pingree D.E. (1970-1994) *Census of the Exact Sciences in Sanskrit* (4 vols.) American Philosophical Society, Philadelphia.
7. Schlingloff D. (2014) *Fortified Cities of Ancient India; A Comparative Study*. Anthem Press India.