Measuring the body of god: Temple plan construction and proportional measurement in early texts on north Indian architecture

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Abstract. By reconsidering the fragments from early texts on north Indian temple architecture, namely the Purāṇas and their supposed sources, this paper sets out to explore the accounts of arrangement of the plans for temple ground plans and the modes of proportional measurement. It is contended that the general system of proportional measurement, called *sāmānya* or *sarvasādhāraṇa* and elaborated on in the texts under discussion, comprises temple *garbha*-shrines of various scales and forms, from which measurements for the entire temple structure are derived. The importance given to the *garbha*-shrine is attested by the method of classification of diverse temple types that are distinguished by the geometrical form of the ground plan of the *garbha*-shrine. It is consequently suggested that the arrangement of the ground plan of a *garbha*-shrine adapted by temple architects most probably reiterated the practices used for building Vedic altars, the layouts of which, as the Śulbasūtras state, might have served as models for structuring the ground plans of *garbha*-shrines.

Introduction

Chapters on Indian architecture in early texts are often addressed to studies of the beginning of temple architecture from the Gupta period and the centuries that followed it almost till the time of the *Samarāṅgaṇasūtradhāra* of Bhoja written in the 11th century. The fragmentary and indefinite description of architectural procedures in those texts highlights just one side of the problem concerning the textual reconstruction of architectural practices of the period. Posited more substantially, the problem reflects the overall reliability of the early vāstuśāstras as texts of visual and material culture that have for a long time been questioned on the basis of irregular and faulty Sanskrit, to recall a sound metaphor by Ramakrishna Gopal Bhandarkar, 'barbarous Sanskrit'.

Still, the early vāstuśāstric passages in such 'barbarous Sanskrit' enable one to shed some light on temple architecture when attested on the basis of the correlation of text and preserved temples. It would not be an underestimation to argue that

I acknowledge my sincere appreciation to K.P. Umapathy Acharya from Kumbakonam (Tamil Nadu) for his valuable comments and suggestions. Whatever faults and mistakes that appear in the article are however mine.

many scholars failed to even adequately raise the problems related to early architectural practices (though not of architectural construction!) due to mistrust of the earliest available accounts of architectural theory in the Purāṇas and related sources. However, more careful examination to these texts, the structure of architectural themes, and their correspondence to the texts of common pedigree tend to convince one that even material of the compilative Purāṇas is subject to a particular framework of the selected themes which has very little to do with the 'overwhelming temptation towards classification' frequently ascribed to the authors of the śāstras.

The architectural material provided in the Purāṇas and their plausible sources, records the architectural practice of north India from the 6th to the 9th centuries and is accordingly limited to the description of various types of north Indian, or Nāgara, temples. Such early architectural practice is found reflected in the *Bṛhatsaṁhitā* of Varāhamihira (henceforth—BṛSaṁ) dating back to the 6th century, the fragments of the Purāṇas, and their probable sources. It is the *Viśvakarmaprakāśa* (ViśvaKaPra.) and the Pāñcarātra treatise *Hayaśīrṣapañcarātra* (PañcaRā.(Ha.).), that are considered the sources of the *Matsyapurāṇa* (MatsyaP.) and the *Agnipurāṇa* (AgniP.) respectively, that along with the other Purāṇas, namely the *Viṣṇudharmottarapurāṇa* (ViṣṇuDhaP.), *Garuḍapurāṇa* (GaruḍaP.), and *Bhaviṣyapurāṇa* (BhaviP.), constitute the early textual tradition of vāstuśāstric knowledge preceding the *Samarāṅgaṇasūtradhāra*. Throughout the paper these texts will be consulted with the general attempt of reconstructing the history of early architectural practices in India. For the sake of simplicity of analysis, the texts of common provenance have been grouped and the MatsyaP. is cited for reference to the ViśvaKaPra., and AgniP. respectively for reference to the PañcaRā.(Ha.). The textual divergences are commented upon when necessary.

The focal point of the subsequent analysis is temple plan arrangements and modes of proportional measurement as described in the aforementioned texts. It is noteworthy that temples in these texts are distinguished according to the arrangement of their ground plan, or construction diagram, which provides proportions for horizontal and vertical structures of the temple such as superstructure, pavilions in front of the entrance to the main shrine, ambulatories around the latter, and so on. To arrange the ground plan of a temple, the inner and outer measures of the shrine with the innermost chamber (*garbhagṛha*), hence refered to as *garbha*-shrine,[1] are pivotal, and early texts

[1] In this paper by *garbha*-shrine is meant the walled inner chamber, or sanctuary, of a temple to distinguish it from the *garbhagṛha* (refered to as *garbha*), or the inner space of a chamber itself. The temples of north India usually have the *garbha*-shrine topped with the tower, or superstructure. Quite often this towered structure with the *garbha* on a ground floor is simply called a shrine, but the term 'shrine' can also stand for the whole, more complex temple. Therefore to avoid the ambiguity between a shrine as a temple and a shrine as a structural part of a more complex temple, I chose to specify the structure of the *garbha* as a *garbha*-shrine.

therefore pay considerable attention to the measurement of the *garbha*-shrine and its constituant structural elements, such as the outer wall, the pedestal for the consecrated image, the image itself, and the entrance doors leading to the chamber.

The construction diagram used for temple plan arrangement is produced by alloting a square building site with a varied number of equal parts that, being divided into an equal number from 4 to 8 along each side of the square, generate a diagram of 16 to 64 grids. This construction diagram could be used both for the plan of a *garbha*-shrine and the temple complex that comprises the adjoining buildings.

The first and so far the most comprehensive analysis of the proportional measurements of Nāgara temples belongs to Stella Kramrisch and is found in her magnum opus *The Hindu Temple* (first published in 1946). Following the study of purāṇic fragments, she distinguished five norms of proportional measurement which basically take their difference from the structure of the square ground plan and the module of either architectural origin or the one taken from the main cult object (*liṅga* or *pratimā*). Four of five norms (namely, Norm I, III, IV and V) vary in the use of the architectural module which conforms to either the outer width of the temple wall, or secondarily, to the width of the *garbha*. Norm II, on the other hand, is a proportional system based on the module taken from the main cult object. After Kramrisch, the scholar who wrote a series of articles on architecture in the Purāṇas, Tahsildar Singh, has been uncritically following Kramrisch's treatment by identifying different modes of proportional measurement as the discriminative feature of various types of temples (cf. Singh 1980; Singh 1981a; Singh 1981b; Singh, Singh 1983). Recently, Patrick Alexander George, in his unpublished doctoral thesis on temple design and construction in north India, returned to the problem of proportional measurement in the Purāṇas, providing annotated translations of their fragments, but the discrepancy of treatment of proportional measurement in these texts did not prove to be worth deeper analysis for him (George 1994).

Evidently both Kramrisch and Singh, by considering the norms of proportional measurement, intended to prove that these norms served as a classifying criterion of various types of temples that are listed in the Purāṇas ranging from 20 to 101. My contention, however, is, and it will be argued in this paper, that it is not the application of the norm of proportional measurement but rather the form of the *garbha*-shrine that might have been taken as a criterion for discriminating the variety of temples listed in these texts. As for the norms of proportional measurement, which I am inclined to term *modes* instead of *norms* to emphasize their *operational* rather than *normative* character, it will be proved that despite the variety of the scale and perhaps even the form of *garbha*-shrines, the entire structures of temples have been

proportioned by taking as a module the length dimension of one of the architectural elements of the *garbha*-shrine: its outer or inner wall or the pedestal of the sacred image. As a consequence my suggestion concerning the interpretation of the modes of proportional measurement discussed in the texts issues from the consideration of different arrangements of ground plans in those texts as an outcome of the integration of the *garbha*-shrine of different size into the construction diagram of a temple rather than the application of distinct modes of proportional measurement for a particular type of temple.[2]

My argument goes that the five-fold classification suggested by Kramrisch and uncritically accepted by her followers is a rather positivistic treatment which has aimed to explain the diversity of temple types listed in texts. To corroborate the classificatory origin of architectural descriptions, along with the minute typologies, the reference to the MatsyaP. which states that temples are to be divided into three types with regard to their scale (small, average and big) (269.26cd: *evaṃ tu trividhaṃ kuryājjyeṣṭhamadhyakanīyasam*) has been commonly cited. However this reference is relevant when the scale of the *garbha*-shrine is considered but not the whole temple building and highlights the central issue of the elaborate description of temple proportions, i.e. the focus on the proportions of the *garbha*-shrine from which the dimensions for other structural parts of temple are derived.

This system of proportional measurement that explores the dimensions of a *garbha*-shrine for proportioning the temple is called *sāmānya* (or *sarvasādhāraṇa*) through the texts. Critical investigation of these texts has suggested that the *sāmānya* system of proportions encompassed diverse modes of proportional measurement (*liṅgamāna*, *garbhamāna*, *kṣetramāna*) all in one or another way being derivative from the dimensions of a *garbha*-shrine. None of these modes, however, is conceived as a normative construction device but rather as a practical method applied to measuring the body of the temple—conceived as the body of god—with regard to the scale and form of the *garbha*-shrine—the most sacred space of the temple. It might be assumed that the procedure of arranging a temple ground plan with the *garbha*-shrine in its centre most probably reiterated the practice of building Vedic altars, the diverse forms of which, as accounted for in the Śulbasūtras and traced in the purāṇic typologies, have been applied to plan the *garbha*-shrine.

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[2] It has already been pointed out by Kramrisch that different norms of measurement that are based on the proportional integration of plan and elevation of the temple emerged 'due partly to the integration of sanctuaries of heterogenous origins into the Hindu temple' (1996, 237). The following analysis is however an elaboration of this attitude which has nevertheless also led Kramrisch to derive norms of proportional measurement from the moduelse of non-architectural provenance which undermines the central function of the *garbha*-shrine for establishing the proportional module for the temple.

Sāmānya/sarvasādhāraṇa system of proportional measurement

The general system of proportional measurement for temples, called *sāmānya* or *sarvasādhāraṇa*, termed by Stella Kramrisch (1996) Norm I, is described in the ViśvaKaPra. 6.56cd–61, the MatsyaP. 269.1–7ab, and the GaruḍaP. 1.47.6–10 (referred to as *sāmānya*) on the one hand, and the AgniP. 42.1–9ab and the PañcaRā. (Ha.). 13.1–9ab (referred to as *sarvasādhāraṇa*) on the other. Each of the texts within its group provides an almost verbatim description of proportional measurement and all the texts share identical dimensions of structural elements. I will therefore use the method of complimentary reading of all five texts for the analysis of this system of proportioning. To illustrate the likely plan arrangements, graphical figures are included to facilitate more comprehensive understanding of the construction practices under consideration. Although it was not my aim to investigate the historical setting of the application of the *sāmānya/sarvasādhāraṇa* system, it will be concluded on typological grounds that temples designed according to this system of proportions can be provisionally identified and historically located.

The distinctive feature of this system is that it uses for the ground plan of the *garbha*-shrine a square construction diagram which consists of 16 equal grids (*bhāga*), out of which 4 central ones should be engaged for the sanctum (*garbhagṛha* or *āyata*), while the remaining 12 should be used for the surrounding wall (*bhitti*). Other proportions of the structure vary in both groups of texts.

1) MatsyaP. 269.1–7ab:[3]

evaṃ vāstubaliṃ kṛtvā bhajet ṣoḍaśabhāgikam |
tasya madhye caturbhis tu bhāgair garbhaṃ tu kārayet ‖ 1 ‖
bhāgadvādaśakaṃ sārdhaṃ tatas tu parikalpayet |
caturdikṣu tathā jñeyaṃ nirgamaṃ tu tato budhaiḥ ‖ 2 ‖
caturbhāge[*na?*]*ṇa bhittīnām ucchrāyaḥ syāt pramāṇataḥ* |
dviguṇaḥ śikharocchrāyo bhittyucchrāyapramāṇataḥ ‖ 3 ‖
śikharārdhasya cārdhena vidheyā tu pradakṣiṇā |
garbhasūtradvayaṃ cāgre vistāro maṇḍapasya tu ‖ 4 ‖
āyataḥ syāt tribhir bhāgair bhadrayuktaḥ suśobhanaḥ |
pañcabhāgena saṁbhajya garbhamānaṃ vicakṣaṇaḥ ‖ 5 ‖
bhāgam ekaṃ gṛhītvā tu prāggrīvaṃ kalpayed budhaḥ |
garbhasūtrasamo bhāgād[or °*samādbhāgā*°] *agrato mukhamaṇḍapaḥ* ‖ 6 ‖
etat sāmānyam uddiṣṭaṃ prāsādasyeha lakṣaṇam |

Following allocation of the *garbha* and its surrounding walls[4] within the 16-part grid,

[3] All subsequent short references within this and the following paragraphs are to the cited text.

[4] The wording in the MatsyaP. 269.2a and the ViśvaKaPra. 6.57c for the arrangement of the walls of the *garbha* as occupying twelve parts and a half (*bhāgadvādaśakaṃ sārdhaṃ*) is obscure.

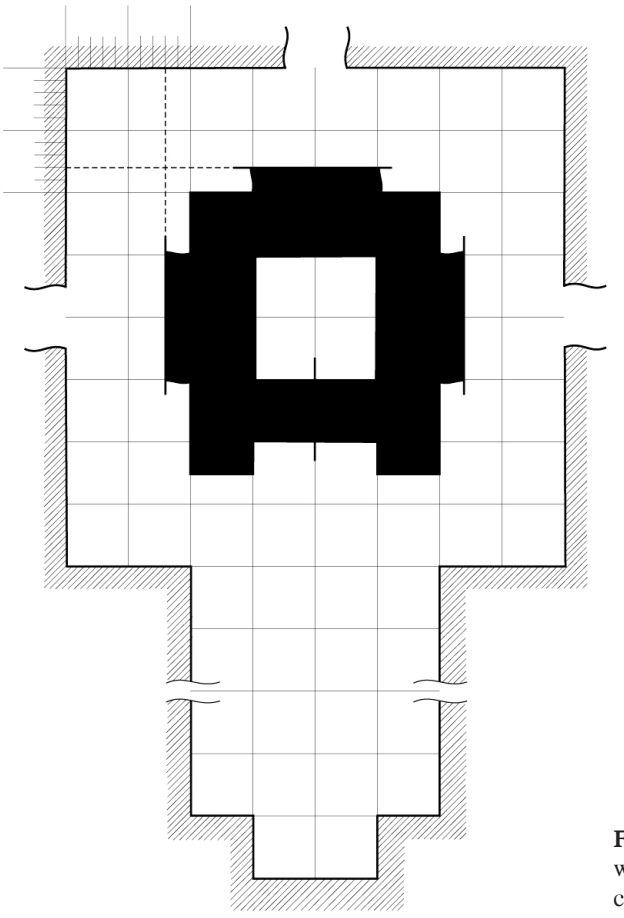

Fig. 1. *Sāmānya* temple plan with 16-grid *garbha*-shrine according to MatsyaP. 269.1–7ab.

it is said that openings should be arranged in the four directions (2cd). The height of the wall should be the measure of the length of four divisional parts (3ab). Twice the measure of the height of the wall is the height of the superstructure (*śikhara*) (3cd). The circumambulation passage (*pradakṣiṇā*) is stated to be a quarter of the superstructure in width (4ab). In front of the *garbha*-shrine and behind the circumambulation passage, a hall (*maṇḍapa*) twice the width of the *garbha* should be allotted (4cd).[5]

Patrick A. George's suggestion that the 'half' might have referred to the sanctum, which is one half of the width of the temple (1994, 87, n. 176), does not seem relevant. Of note is the fact that the verse under consideration omits the reference to the wall as an arrangement around the *garbha*. Therefore, in spite of the violation of the metrics of the verse, I suggest the meaningful emmendation of *sārdhaṃ* for *bhittyarthaṃ* following closely the wording in the AgniP. 42.2cd: *dvādaśaiva tu bhāgāni bhittyarthaṃ parikalpayet* 'then one should allot twelve parts for the wall'. Cf. GaruḍaP. 1.47.7ab: *bhāgadvādaśikāṃ bhittiṃ tataśca parikalpayet*.

[5] To translate the latter verse, I consider it relevant to follow Kramrisch's treatment of *garbhasūtradvayaṃ* as referring to the length of the *maṇḍapa* twice the width of the *garbha* (1996,

Further, the *garbha*-shrine (*āyata*) is prescribed to be made with beautiful offsets (*bhadra*) from three sides (5ab), each projecting 1/5 the width of the *garbha* (5cd).[6] Having allotted one part for the protruding walls (i.e. half a part for each), the walls of the porch (*prāggrīva*) are made (6ab). In front of the pavilion (*maṇḍapa*), an entrance hall (*mukhamaṇḍapa*) that is the *garbha*'s width and projects by one part should be constructed (6cd) (fig. 1).

Line 2cd ('Then openings (*nirgama*) are known [as being placed] in the four directions by the wise man') is more problematic than might appear at first sight and therefore deserves closer inspection. The phrase is almost verbatim found not only in the ViśvaKaPra. 6.59cd but also in the GaruḍaP. 1.47.9ab. What is of considerable importance here is the term *nirgama*, which elsewhere in our texts stands for 'projection', but in this place this meaning creates serious difficulties for interpretation. Referring to the primary meaning of the term, *nirgama* in this place has commonly been treated by scholars as projection, or offsets, on the outer wall of the *garbha*-shrine.[7] However, since *nirgama*s in 2cd are reported to be placed in the four directions, there is sufficient reason to question the meaning of 'projection' because at least one side of the temple, where the doors are installed, has no projecting offset. Taking into consideration inconsistencies of interpreting *nirgama*s as projections, Patrick A. George has made an attempt to introduce a new understanding of *nirgama*. It is the appearance of the term in the MatsyaP. immediately after the description of the *garbha*-shrine that perhaps induced George to relate this term with the latter and translate *nirgama* as 'doors', but no comment upon his choice of the terms has been provided (George 1994, 87). Yet such a relation is architecturally hardly feasible since the *garbha*-shrine described in the MatsyaP. is a walled structure, whereas the structure with four doors should have been an almost open pavilion with narrow walls at the corners holding the superstructure. It is concomitantly untenable in terms of the massive superstructure prescribed further in the text as being twice the measure of the height of the wall.

The position in which the term *nirgama* appears in the MatsyaP. is perhaps decisive in arguing its meaning. Interestingly, in the ViśvaKaPra. 6.58cd and the

chart 1) rather that accepting the meaning of equality in length to two lines (*sūtradvayaṃ*) that issue from the *garbha*, which is suggested by Singh, Singh 1983, 56. (For the supporting meaning of *garbhasūtra* see *garbhasūtrasamo* with regard to the dimensions of the *mukhamaṇḍapa* in 6c.) Moreover, my contention is that 'in front' (*agre*) refers to *pradakṣiṇā* rather than *garbha*. Cf. rendering 'the *maṇḍapa* attached to the *garbhagṛha*' (Singh, Singh 1983, 56).

[6] Judging from the measurements given in Chart 1 in Kramrisch 1996 she treats *āyata* in 5ab as a pavilion of the *maṇḍapa* which is suggested to project in three parts (*tribhir bhāgair*) and to be flanked by *bhadras* from outside. I, however, restrict myself to the frequent meaning of *āyata*[*na*] as a *garbha*-shrine used in early texts and inscriptions (cf. Willis 2009) though it can also mean an addition to the structure of the temple (see Gonda 1969).

[7] Kramrisch 1996, 229 considers *nirgama*s as projections of the buttresses in the middle of each of the three sides of the temple. Cf. the glossary of Sanskrit terms in Singh, Singh 1983, 55.

GaruḍaP. 1.47.9ab, *nirgama* happens to appear in the verse along with the dimensions of the *pradakṣiṇa*.[8] This corroborates the view that *nirgama* is actually related to the *pradakṣiṇa* instead of the *garbha*-shrine. To judge by the reconstruction of early stone temples in north India, especially the early 6th-century Gupta Viṣṇu temple at Deogarh and the 7th-century temples of the early Calukyas, it seems likely that the *nirgama*s might have designated the openings of the roofed ambulatory around the *garbha*-shrine. To refer to Klaus Imig's reconstruction of the Gupta temple in Deogarh, it had such porticoed openings on each side to illuminate the ambulatory and, in particular, the pilaster-flanked reliefs on the *garbha* walls (Imig 2003). The use of the openings, varied in number, in the walled enclosure is also found in the temples of the early Calukyas, Galaganātha temple in Paṭṭadakal (c. 685–696), Svarga-Brahmā temple in Ālampur (almost the contemporary of the preceding temple), and the Paṭṭadakal Pāpanātha temple modeled on Ālampur, being merely a few examples (EITA, 290–1, 305, 330–2). Accordingly my suggestion would be, to avoid confusion, to consider *nirgama*s not as doors, misleadingly associated with those of the *garbha*-shrine, but as the openings within the ambulatory wall, the number of which is four (*caturdikṣu*) as in the MatsyaP. and the GaruḍaP., or two, one from each side (*ubhayoḥ pārśvayoḥ*), as in the AgniP. 42.4cd and the PañcaRā.(Ha.). 13.4cd. It should be noted that the four openings referred to in the MatsyaP. and related texts must have differed in size, the one in front of the *garbha*-shrine being more spacious than the other three; since these texts prescribe the *maṇḍapa* to be less wide than the *pradakṣiṇa*, the junction between these two structures naturally produces a fourth—although broader—opening within the front wall of the *pradakṣiṇa*.

2) AgniP. 42.1–9ab:

prāsādaṃ sampravakṣyāmi sarvasādhāraṇa[*ṃ*] *śṛṇu* |
caturasrīkṛtaṃ kṣetraṃ bhajet ṣoḍaśadhā budhaḥ ‖ 1 ‖
madhye tasya caturbhis tu kuryyād āyas[*t?*]*am anvitam* |
dvādaśaiva tu bhāgāni bhittyarthaṃ parikalpayet ‖ 2 ‖
jaṅghocchrāyan tu karttavyaṃ caturbhāgeṇa cāyatam [or *saṁyutam*] |
jaṅghāyāṃ dviguṇocchrāyaṃ mañjaryyāḥ kalpayed budhaḥ ‖ 3 ‖
turyyabhāgena mañjaryyāḥ kāryyaḥ samyak pradakṣiṇaḥ |
tanmāna nirgamaṃ kāryyaṃ ubhayoḥ pārśvayoḥ samaṃ ‖ 4 ‖
śikhareṇa samaṃ kāryyam agre jagati vistaram |
dviguṇenāpi karttavyaṃ yathā śobhānurūpataḥ ‖ 5 ‖
vistārān maṇḍapasyāgre garbhasūtradvayena tu |
dairghyāt pādādhikaṃ kuryyān madhyastambhair vibhūṣitam ‖ 6 ‖
prāsādagarbhamānaṃ vā kurvvīta mukhamaṇḍapam |

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[8] See ViśvaKaPra. 6.58: *śirorārddhasya cārddhena vidheyā tu pradakṣiṇā* | *caturdikṣu tathā jñeyo nirgameṣu tathā budhaiḥ*; GaruḍaP. 1.47.8cd–9ab: *śikharārddhasya cārddhena vidheyās tu pradakṣiṇāḥ* ‖ *caturdikṣu tathā jñeyo nirgamas tu tathā budhaiḥ* |

ekāśītipadair vvāstuṃ paścāt maṇḍapam ārabhet ‖ 7 ‖
śukān prāgdvāravinyāse pādāntaḥsthān yajet surān |
tathā prākārāvinyāse yajed dvātriṁśad antagān [or °*d antare*] ‖ 8 ‖
sarvasādhāraṇaṃ caitat prāsādasya ca lakṣaṇam |

The AgniP. 42.1–9ab and the PañcaRā.(Ha.). 13.1–9ab in principle follow the description of the four-part *garbha*-shrine plan described in the preceding paragraph. In the interpretation that follows, I will therefore highlight only those points in the text that deviate from the texts of the MatsyaP. group.

Attested by comparative reading, the wording in the AgniP. 42.3cd 'One who knows should fix twice the height of the superstructure (*mañjarī*) in the outer wall (*jaṅghā*)',[9] which means that the *mañjarī* is two times lower than the *jaṅghā*, seem to be incongruous in the context of the neighboring lines. 3ab states that the height of the *jaṅghā* is to be extended by four parts (*bhāga*), while the proceeding *śloka* prescribes the width of the *pradakṣiṇā* as being a quarter of the *mañjarī*. Following these dimensions, the width of the *pradakṣiṇā* would correspond with one-fourth of the width of the sanctum[10] which is evidently untenable from a practical point of view. Thus, the meaning supposedly is that the *mañjarī*'s height is twice that of the *jaṅghā*, which consequently accords with the corresponding account in the MatsyaP. 269.3cb and the GaruḍaP. 47.8ab.

In addition to the MatsyaP. and the GaruḍaP., the dimensions of the *nirgama*s—here openings on both sides of the *pradakṣiṇā*—are provided as being the same breadth as the *pradakṣiṇā* (4cd). Furthermore, a new structural element—a basal platform or *jagati* (perhaps corrupt form of *jagatī*)—is mentioned, the measure of which is said to be equal to or, conforming to beauty, to be twice the height of the superstructure (5).[11] Given that the *jagatī* extended for the height of the superstructure, it should have conformed to the outer border of the *pradakṣiṇā*. In case of being planned twice that size, a broad passage around the closed *pradakṣiṇā* would have been made. Discrete descriptions of the *pradakṣiṇā* and the *jagatī* given in the text seemingly refer to the practice of using a covered ambulatory, since otherwise it would be hard to explain why the dimensions of an open ambulatory were considered separately if the basal platform could have been also used for the circumambulation ritual.

The dimensions of the hall (*maṇḍapa*) and entrance hall (*mukhamaṇḍapa*) are reiterated as they appear in the MatsyaP. with the sole explanatory remark that the

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[9] Cf. PañcaRā.(Ha.). 13.3cd: *jaṅghāyā dviguṇocchrāyaṃ mañjaryyāḥ kalpayed budhaḥ.*

[10] Having no coherent meaning in the text, the word for sanctuary, *āyasa* (2b), should be emended with the *āyata* which also appears later on in the text. See Singh 1981, 193, n. 12.

[11] One should notice that terms for the superstructure, *mañjarī* and *śikhara*, are used in the text interchangeably. As for the *agre* in 5b, it certainly means 'at the base' of the temple structures and refers to the platform (*jagatī*) rather than the uppermost part of the *śikhara* as George would suggest (1994, 96–7).

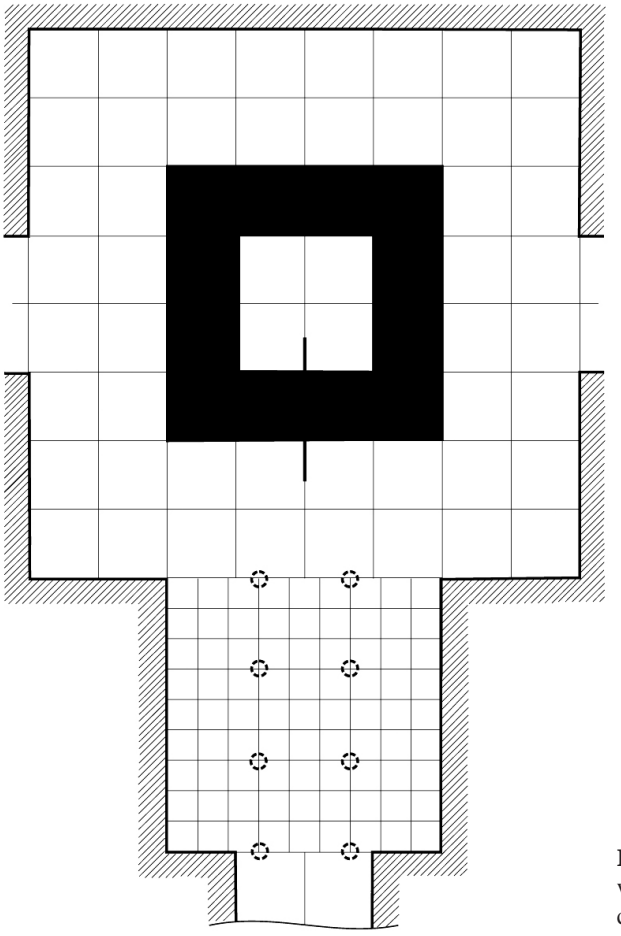


Fig. 2. *Sāmānya* temple plan with 16-grid *garbha*-shrine according to AgniP. 42.1–9ab.

maṇḍapa should be decorated with pillars along its length (6cd) and arranged within the site divided into 81 parts (7cd). The *śuka*[*nāsa*] should be erected above the doorway, while within the *śuka*[*nāsa*] the gods are sculptured and flanked by two pillars [or pilasters] (*pādāntaḥstha*) intended to be worshiped (8ab).

Finally, the passage under consideration at the very end refers to the 32 deities housed on the surrounding wall (*prākāra*) (8cd). Since there are no separate dimensions of the *prākāra* as a rampart-wall (to which this term usually refers), I infer that the reference is made to the 64-grid (8×8) ritual diagram, termed *maṇḍūka maṇḍala* and its outer row in particular.[12] The latter consists of 28 grids, but the method of housing the guarding deities (*padadevatās*) requires placing two deities at each of

[12] *Maṇḍūka maṇḍala* as a ritual device for offerings at the site of the temple is accounted for in the AgniP. 40.2–13. See also Kramrisch 1996, 67–97.

the corners, which are considered the most vulnerable places of the *maṇḍala*, so that the total number of deities comes to 32. Furthermore, if we superimposed a 64-grid diagram upon the constructional diagram of the temple surrounded by the *pradakṣiṇā* as described above, we would notice that the outer row of the ritual diagram faced the enclosing wall of the *pradakṣiṇā* or, if the enclosing wall fell within the passage's space, even overlapped it. It is relevant therefore to think of *prākāra* as the enclosing wall of the circumambulation passage rather than a rampart wall around the temple complex. The question remains open as to the deities established within this enclosure (*prākārāvinyāse*), which can be interpreted either as the sculpured images or the *padadevatās* of the ritual diagram (fig. 2).

To sum up, from the accounts of the the Purāṇas and the related texts discussed above, it might be concluded that the general system of temple proportional measurement called *sāmānya* or *sarvasādhāraṇa* was common to all architectural traditions and supposedly came from a single source, which could also also have served as the basis of the texts under consideration.

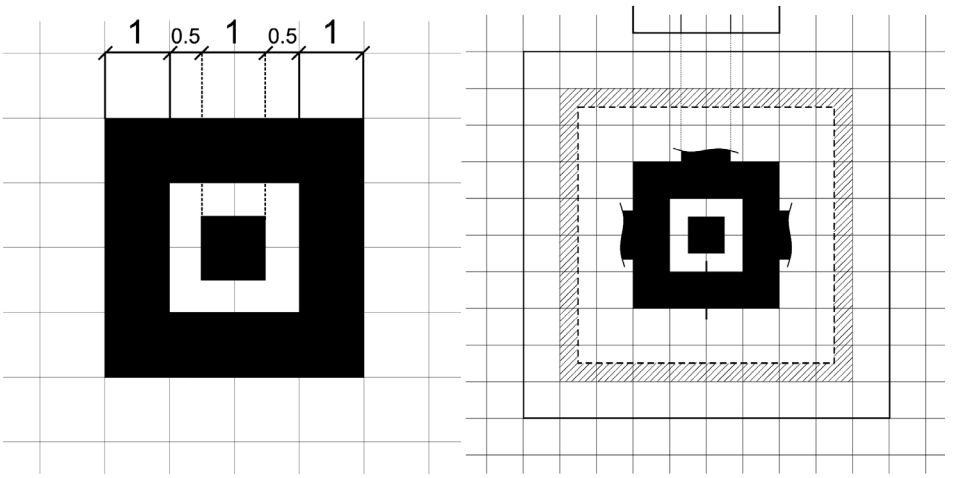
Variations of the *sāmānya* system of measurement

Although in the preceding paragraph all the texts addressed share common construction principles for a temple that is planned on a 16-part construction grid of which 4 are allocated to the *garbha* and the remaining 12 to its walls and surrounded by supposedly closed ambulatory, some other texts, the AgniP. 104 and the ViṣṇuDhaP. 3.88 in particular, provide alternative measurements of the 'general' (*sāmānya*) system. The AgniP. under the label of *sāmānya* considers three modes for arranging a temple ground plan that are produced by dividing the site into four, five, or six proportional parts respectively, while the ViṣṇuDhaP. devotes an entire chapter entitled 'Sāmānyaprāsādalakṣaṇa' to the elaboration of a 64-grid plan for a temple. Such a variety of ways to arrange the ground plan suggests that the construction diagram of 16 grids was not considered a discriminative feature of the *sāmānya* system as Kramrisch has argued (1996, 237, n. 19). What is meant by '*sāmānya*' can be seen when 'deviant' modes of arranging the ground plan are investigated in detail.

1) AgniP. 104.1–9ab:

vakṣye prāsādasāmānyalakṣaṇaṃ te śikhidhvaja |
caturbhāgīkṛte kṣetre bhitter bhāgena vistarāt ‖ 1 ‖
adri[or *ardha°*]*bhāgena garbhaḥ syāt piṇḍikā pādavistarāt* |
pañcabhāgīkṛte kṣetre [*'*]*ntar*[or *vāpi madhya°*]*bhāge tu piṇḍikā* ‖ 2 ‖
suṣiraṃ bhāgavistīrṇaṃ bhittayo bhāgavistarāt |
bhāgau dvau madhyame garbhe jyeṣṭhabhāgadvayena tu [or *madhyamo garbho jyeṣṭho bhāga°*] ‖ 3 ‖

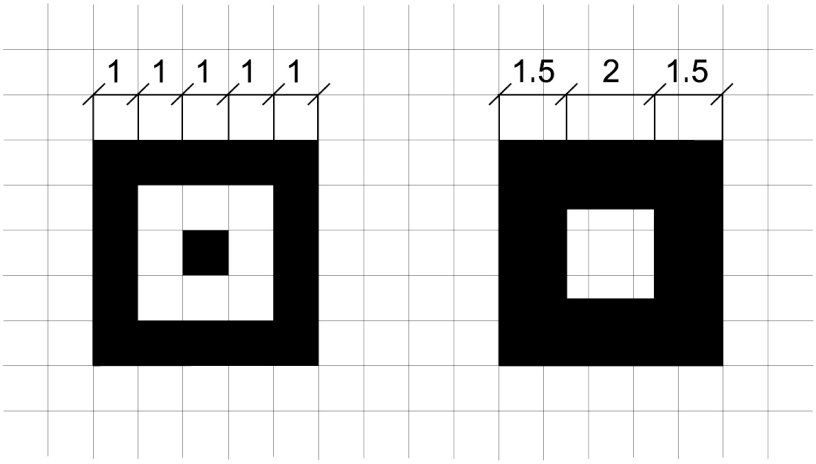
tribhis tu kanyasā[*o?*] *garbhaḥ śeṣo bhittir iti kvacit* |
ṣoḍhā bhaktethavā kṣetre bhittir bhāgaikavistarāt ‖ 4 ‖
garbho bhāgena vistīrno bhāgadvayena piṇḍikā |
vistārād dviguṇo vāpi sapādadviguṇo 'pi vā ‖ 5 ‖
arddhārddhadviguṇo vāpi triguṇaḥ kvacid ucchrayaḥ |
jagatī vistarārddhena tribhāgena kvacid bhavet ‖ 6 ‖
nemiḥ pādona vistīrṇā [or *pādena vistīrṇāṃ*] *prāsādasya samantataḥ* |
paridhis tryaṁśako madhye rathakāṁs tatra kārayet ‖ 7 ‖
cāmuṇḍaṃ bhairavaṃ teṣu nāṭyeśaṃ ca niveśayet |
prāsādārddhena devānām aṣṭau vā caturo 'pi vā ‖ 8 ‖
pradakṣiṇāṃ vahiḥ kuryāt prāsādādiṣu [or *prāsādād dikṣu*] *vā navā* |



Figs 3a (left) and **3b** (right). The 4-part *garbha*-shrine plan according to AgniP. 104.1–9ab.

The description of the general characteristics of a temple (*prāsādasāmānya-lakṣaṇa*) is commenced with the 4-part, or 16-grid, ground plan. The building site is to be divided into four parts, and the wall should be made one part wide (1cd). The *garbha*[-passage] should be made with half a part and the pedestal with a width of one-fourth of the building site (2ab). As George rightly points out, the proportional part (*bhāga*) here refers to the linear measure, specifically width, but not the site (George 1994, 91). The word *garbha* as characteristic to the AgniP. (cf. 42.10c) is used to denote the passage around the pedestal rather than the innermost chamber proper (fig. 3a).

When the building site has been divided into five parts, the pedestal has the middle part (2cd), the open space (*suṣiraṃ*) has a width of one part, and one part is allocated to the walls (3ab) (fig. 4a). With reference to an unidentified source (*iti kvacit*) the texts state that there are two possible arrangements of the five-part plan, the best of



Figs 4a (left) and **4b** (right). The 5-part *garbha*-shrine plan according to AgniP. 104.1–9ab.

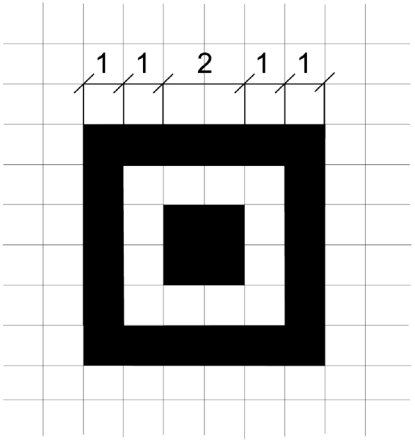


Fig. 5. The 5-part *garbha*-shrine plan according to AgniP. 104.1–9ab.

which is when the sanctum occupies the middle two parts (3cd) (fig. 4b), while in other less desirable arrangements, the sanctum is made with three parts, the wall being made of what remains (4ab) (cf. fig. 4a) (George 1994, 92–3).

When the building site is divided into six parts, a wall is made from the width of one part (4cd), the width of the *garbha*-passage is made with one part, and the pedestal is made with two parts (5ab) (fig. 5).

It is noteworthy that the height of the temple is proportioned according to its width but not the height of the wall as is usual in other modes of measurement. The height of the temple should consequently be either two or two and one-quarter (5cd), or two and one-half, or even three times the width of the temple (6ab). Whatever the width of the wall of the temple, the height of the basal platform (*jagatī*) should be made three

and one-half times the width of the temple (6cd).[13] The platform-plane (*nemi*) of the temple[14] should be made 1/4 less (*pādona*)[15] than the width of the temple all around it (7ab). Besides, the temple under discussion should have niches (*rathaka*) made in the middle 1/3 of the outer wall (*paridhis*) (7cd) where four or eight images of gods such as Cāmuṇḍa, Bhairava, and Naṭeśa are to be created (8). The circumambulatory passage (*pradakṣiṇā*) can be either constructed around the temple or absent (9ab) (fig. 3b; here a four-part temple plan stands for an example, though similar surrounding structures might be characteristic to all the subdivisions of this plan). Further the creation of other gods and establishment of the vertical division of the *śikhara* is accounted, which has no particular relevance to our topic.

As discussed in the previous paragraph, the description of the circumambulatory passage seemingly refers to a roofed type of *pradakṣiṇā*. Now, if we take the fragment in the AgniP. 104.1–9ab as an extension of the description of the *sāmānya* system, my hypothesis about the roofed *pradakṣiṇā* can be attested in this text because of the order the elements of the temple structure are listed. The *pradakṣiṇā* is considered there as an optional structural element that can be either constructed all around the temple or simply absent. The line appears immediately after the measurements of the basal platform (*jagatī*), the platform- plane (*nemi*) surrounding the temple, and the installations within the niches (*rathaka*s) of the temple wall. If by *pradakṣiṇā* an open circumambulatory space had been meant, there would have been no need to mention its optional construction. Perhaps it is not incidental that the MatsyaP. and the ViśvaKaPra.[16] in various places along with the description of the *pradakṣiṇā* prescribe that the superstructure is to be built upon the walls of the *garbha*. It might infer that the *pradakṣiṇā*

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[13] I support the view that the dimensions of the *jagatī*, as well as those of the *śikhara*, refer to its height but not width as George 1994, 95 would suggest. The platform-plane (*nemi*) or circumambulatory passage (*pradakṣiṇā*) determines the width of the space around the temple.

[14] The meaning of the term *nemi* is problematic, and therefore reference to available earlier sources is of particular importance. I consider it appropriate to attest its meaning by reference to the compound *śīlan-nemi* ('the ground platform') defining the structures of a *caitya*, which is met in the passage entitled 'Prakīrṇaka-caitya-lakṣaṇa' included in the Nepalese Sanskrit treatise *Stūpa-lakṣaṇa-kārikā-vivecana* (ca. 2nd century A.D.) attributed to the Lokottaravādins (Roth 1980, 193). Terminology derived from Buddhist architecture found a place in the Hindu tradition from the beginning of structural masonry architecture in the Gupta period. For the Buddhist influences on temple architecture reflected in the Purāṇic texts, see more in my forthcoming article 'Building visual order in Kashmir: Analysis of architectural structures as described in the *Viṣṇudharmottarapurāṇa*'.

[15] An orthographical rendering of the word as *pādena* (of 1/4 part) seems to be architecturally inconsistent having in mind that one of the following verses speaks of a circumambulatory passage that could be constructed around the temple, yet 1/4 the width of the temple would not have been sufficient for that.

[16] See MatsyaP. 269.12ab: *ūrdhvaṃ bhittyucchrayāt tasya mañjarīṃ tu prakalpayet* 'The superstructure should be made rising from the walls'; and ViśvaKaPra. 6.79ab: *kārayecchikharaṃ tadvat prākārasya vidhānataḥ* 'Likewise the superstructure should be build upon the enclosure [of the *garbha*] according to the measurements [stated above]'.

was meant to be a closed ambulatory covered with a sloping roof most frequently found in the aforementioned temples of the Guptas and early Calukyas.

Before proceeding to another variation of *sāmānya* construction, one specific innovation of the 'general' system of measurement deserves to be remarked upon. Patrick A. George pointed out that the subdivisions of the temple plan found in the AgniP. 104 would not necessarily be squares, nor even geometrically equivalent shapes (1994, 92). The AgniP. in the same chapter (104.11cd–21) classifies 45 types of temples that are grouped into five categories according to the form of the temple plan, namely square, rectangular, circular or stellate, apsidal, or octagonal. A virtually identical typology of temples is also encountered in the GaruḍaP. (1.47.19–29), while less elaborate classifications of 20 types of temples are found in the MatsyaP. (269.27cd–55) and the BhaviP. (1.130.23cd–37). Recent explorations of extant temples having a ground plan other than square prove that from the late 7th c. through the early 8th c. all these varieties of temple plans could be found throughout region of central India (Stadtner 1981; Meister 1981–2; Meister 1983; Harding 2003). Moreover, the *liṅgamāna* and *kṣetramāna* modes of measurement discussed later in this paper also explore the linear measure which, as has been suggested, was applied to generate different forms of temple plans. With reservation therefore, it might be argued that the modes of measurement of the *sāmānya* system are applicable not only for temples with a square plan but also for those with a rectangular, circular or stellate, apsidal, and octagonal plan.

'Sāmānyaprāsādalakṣaṇa' of the ViṣṇuDhaP. and the 64-grid temple plan

Chapter 88 of the ViṣṇuDhaP. is not a single passage where temple proportions are given, although this chapter solely aims at providing 'the general' (*sāmānya*) system of measurements. The *sāmānya* system is preceeded by a description of 100 types of temples wherein the Himavān type (3.86.4–12) is provided with a more complex description of its construction than other types. Furthermore, the entire Chapter 87 is devoted to a single type of temple called Sarvatobhadra, which generally draws its measurements from the *sāmānya*. As will be shown throughout the critical gloss of the *sāmānyaprāsādalakṣaṇa* of the ViṣṇuDhaP. below, the framework of the latter is virtually a reiteration of the BṛSaṁ. 10–16. It is therefore highly plausible that the proportional system of the ViṣṇuDhaP. was guided by the norms of architectural practice common to the period of Varāhamihira.

1) ViṣṇuDhaP. 3.88.1–10:

sāmānyam atha vakṣyāmi prāsādānāṃ tu lakṣaṇam |
catuṣṣaṣṭipadaṃ kāryaṃ devatāyatanaṃ sadā ‖ 1 ‖

dvāraṃ ca madhyamaṃ tasya samadiksthaṃ praśasyate |
dvāraṃ vistarataḥ kāryaṃ bhūpāla dviguṇocchrayam ‖ 2 ‖
...
dvāramānāṣṭabhāgonāṃ pratimāṃ tu sapiṇḍikāṃ |
dvau bhāgau pratimā tatra tṛtīyāṁśaś ca piṇḍikā ‖ 5 ‖
kaṭir aṣṭamabhāgonaṃ dvāre [or *dvāraṃ*] *kāryā* [or *kāryaṃ*] *vijānatā* |
tṛtīyam aṁśaṃ vasudhā tṛtīyāṁśaḥ kaṭir bhavet ‖ 6 ‖
mañjarī ca tṛtīyāṁśaḥ prāsādasya mahābhuja |
garbhaṃ pādena [or *pādona*] *vistīrṇaṃ tathā dvāraṃ praśasyate* ‖ 7 ‖
bhittir garbhāṣṭabhāgonā tathā kāryā vijānatā |
prāsādocchrāyabhāgena caturthena ca śasyate ‖ 8 ‖
vasudhāsañcaro rājan kaṭyaṃśadvitayena tu |
aṣṭamena tathā hīno madhye sopāna iṣyate ‖ 9 ‖
samasaṁkhyaṃ tu kartavyaṃ sopānaṃ nityam eva tu |
nāṭyarthaṃ saṁkaṭaṃ kāryaṃ na vistīrṇaṃ tathaiva ca ‖ 10 ‖

The chapter starts with indication that the site of the temple should be divided into 64 parts (*pada*s) (1cd). The central doorway, placed in one of the cardinal regions (2ab), should be made twice as high as its width (2cd). An image with a pedestal is said to be 1/8 of a part lower than the height of the doorway,[17] the image itself comprising two parts while the third being that of the pedestal (5). A bit further, the text prescribes that it is commendable for the doorway to occupy 3/4 of the the width of the *garbha* (7cd) (fig. 6).[18]

What is of particular importance here but nevertheless did not attract the attention of Lubotsky and other scholars is that reading *garbhapādena* is untenable from a practical perspective. Given the established proportions of the doorway being twice as high as its width and the width of the *garbha* being almost twice the width of the temple (see 8ab below), the measure of the width of the door being 1/4 that of the *garbha* would generate a height equal to 1/4 of the width of the temple, which is structurally entirely impossible. As for the reading of the line in the BṛSaṁ., I would accept its supposedly more correct rendering in the BhaviP. as *garbhapādona* ('less by a quarter'). If 3/4 of the width of the *garbha* is composed of the doorway (which is appropriate if the doorway is meant to include an elaborate doorframe like those of the Gupta temples), 6ab would not sound like a reiteration of 7cd as Lubotsky believes. If we accept Shah's (1958) editorial emendation of *kāryaṃ* to *kāryā* and Lubotsky's proposal to emend *aṣṭamabhāgonaṃ* to *aṣṭamabhāgena* (1992, 208, n. 11),

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[17] For better syntax of the verse see its almost literal rendering in the BṛSaṁ. 56.16: *dvāramānāṣṭabhāgonā pratimā syat sapiṇḍikā* | *dvau bhāgau pratimā tatra tṛtīyāṁśaś ca piṇḍikā* (Lubotsky 1992, 208, n. 10). Cf. identical dimensions for the image related to the Himavān type of temple in the ViṣṇuDhaP. 3.86.9ab: *dvārocchrāyaś ca kartavyo devāś cāṣṭāṁśasaṃyutāḥ*.

[18] Again, as Lubotsky rightly suggests, syntactically inconherent *garbhaṃ pādona* should be emended to *garbhapādona* on the model of the the BṛSaṁ. 56.12cd: *garbhapādena vistīrṇaṃ dvāraṃ dviguṇaṃ ucchritam* (1992, 208, n. 11).

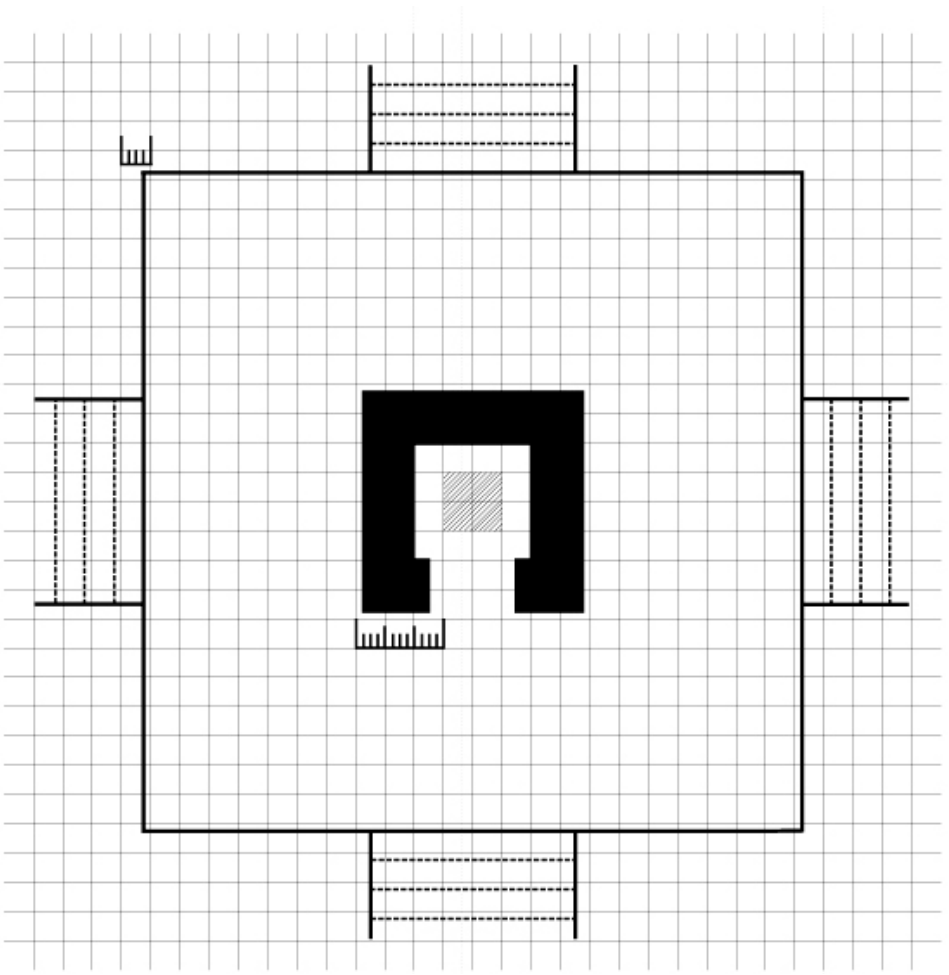

Fig. 6. The 64-grid temple plan of the *sāmānya* type according to ViṣṇuDhaP. 3.88.1–10.

the line appears to establish the height of the wall, which is 1/8 of a part bigger than the doorway. The height of the wall logically entails the division of the total height of the temple which consists of three equal parts: the basal platform (*vasudhā*), the outer wall of the *garbha*-shrine (*kaṭi*),[19] and the superstructure (*mañjarī*) (6cd–7ab).

The height of the outer wall of a temple, which according to the reconstruction of the measurements above comprises 9/8 of the heigth of the doorway, is close to the width of the temple prescribed in 8ac. The text states that the wall (*bhitti*) should be made 1/8 less than the width of the *garbha*, where by *bhitti* most probably the

[19] As Dagens 2003 has proved, the term *kaṭi* in the ViṣṇuDhaP. 3.88 has distinct meaning from that in the BṛSaṁ. where it most probably stands for 'the platform'. See further discussion in the paragraph on the Varāhamihira's treatise.

thickness of both walls is meant (Lubotsky 1992, 209).[20] The height of the wall is proportional to 1/4 of the height of the temple (8cd).[21] The walking area on the platform (*vasudhā-sañcara*) is twice the width of the wall (*kaṭi*) (9ab). The length of the *sañcara* as a matter of fact entails the calculation of the lengtht of the platform (*vasudhā*), which is the length of the *sañcara* plus the width of the wall so that the *sañcara* extends three times the width of the temple wall. Furthermore, the staircase is to be arranged at the middle of the platform border within the width of 1/8 less that of the *kaṭi* (9cd).[22] The staircase has to have the same number of steps, which have to be neither too dense nor too expanded (10).[23]

Along with textual analysis, archaeological data of the extant temples from the Gupta period can be brought in support of application of the *sāmānya* system of the ViṣṇuDhaP. Following the most elaborate description of the Sarvatobhadra type in Chapter 87, we observe that it shares many general features of the *sāmānya*. As it has been persuasively proven by Madho Sarup Vats (1952) and Alexander Lubotsky (1992, 1996), the Gupta temple of Viṣṇu at Deogarh (Jhansi district, Uttar Pradesh), dated to the first quarter of the 6th century, bears many features of the Sarvatobhadra temple. Not to get into details of comparative analysis, I shall touch upon a few common features to support the argument that the *sāmānya* system of measurement and the temple at Deogarh exemplify parallel architectural practices.

Even though the ViṣṇuDhaP. states that the temples of the *sāmānya* system derive from the 64-grid ground plan, it seems that in practice this construction grid has not been identified with the ground plan of the main temple (*mūlaprāsāda*). As Michael W. Meister points out, the dimensions of the remains of the Deogarh Viṣṇu temple prove that the 64-grid diagram covered the entire temple complex; the corners of the

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[20] Very close proportion is found in the BṛSaṁ. 56.12ab (see below). Interestingly enough, Michael W. Meister, when investigating the plans of the temples from Western India dated from the 7th to the 10th centuries has pointed out that the width of the *garbha* wall when measured from the corner (*karṇa*) does not match the prescribed ratio of 1:2 with regard to the width of the *garbha* and could not be easily accomodated within the 64-grid construction diagram. The prescribed proportions are however strictly followed when measured from the projection of the *bhadra*, which perfectly coincides with the border of the diagram (see Meister 1979, 207ff.) It is possible that the dimensions of the width of the outer wall in the ViṣṇuDhaP. correspond to the prevalent architectural practice attested by Meister.

[21] Given that the term *bhitti* here is synonymous to *kaṭi*, the measure of the wall strikingly contradicts proportions laid out in 6cd–7ab, where the wall comprises 1/3 of the total height of the temple. In contradiction to the meaning of *tṛtīya aṁśa* in 6cd–7ab as a proportionalproportional third part, the reading as referring to 'one of the three parts' in general as associated with the total height of the temple would be more appropriate. Cf. Also Dagens' hesitation towards the reliability of such triple proportional division in the ViṣṇuDhaP. attested by proportional measurement in the BṛSaṁ. (2003, 112).

[22] Cf. ViṣṇuDhaP. 3.86.6cd: *kaṭimūlāṣṭabhāgona sopānavistaro bhavet* 'The width of the staircase should be 1/8 less than the measurement of the bottom of the *kaṭi*'.

[23] Cf. ViṣṇuDhaP. 3.86.7ab: *samasaṁkhyaṃ tu kartavyaṃ sopānaṃ …*

diagram coincide with the shrines at the corners of the walking platform (*sañcara*), while the *garbha* of the main temple takes four grids at the centre of the diagram (Meister 1979, 205). The correspondence with the proper *sāmānya* mode, which accomodates the *garbha* within 4 grids out of 16, is by no means accidental.

The second issue which deserves mention is the proportions of the platform. As stated in the ViṣṇuDhaP. 3.88.9ab, the width of the platform should be calculated by adding the width of the walking platform around the temple to the width of the outer wall of the temple. Archaeological reconstruction shows that the width of the platform of the Deogarh temple approximates those dimensions (Lubotsky 1992, 209). Besides, given the reliability of the hypothetical height of the ruined superstructure at Deogarh by Vats, it bears close resemblance to the proportions of the *sāmānya* mode in the AgniP. 42.5 (and the PañcaRā.(Ha.) 13.5), which states that the length of the platform should equal the height of the superstructure (*śikhara*) or be double that height. It may be argued that the architect of the Deogarh temple followed the second option of proportion.

Variant accounts of the 64-grid temple plan

Despite the prescription of the 64-grid ground-plan for the temple in the ViṣṇuDhaP. 3.88, it has been clearly shown that that diagram did not serve for allocation of its structural elements. The same stands for the BṛSaṁ. 56.10–16 and the BhaviP. 1.130.17–23ab, which repeats the fragment from the Varāhamihira's treatise nearly word-for-word, while the more proportion-related 64-grid plan is accounted for only in the GaruḍaP. 1.47.1–5. In contrast to the ViṣṇuDhaP., none of these texts explicitly names this mode of measurement for temples planned on the 64-grid diagram as *sāmānya*. This seemingly encouraged Kramrisch to treat this type of temple plan as a distinct feature of Norm V in her classification (Kramrisch 1996). As characteristic features of this norm, she saw the tripartite vertical division of the temple into the platform, the main temple, and the superstructure. Omission of the term *sāmānya* in the BṛSaṁ. and the BhaviP. after it might be because both texts provide solely this temple plan, and therefore no particular term for that is required, while the GaruḍaP. clearly reserves this term for the 16-grid plan of a temple which immediately follows the 64-grid one.

The validity of the tripartite division of a temple as a decisive characteristic of the type of temple planned on the 64-grid arrangement is hardly sufficient, however. As will be shown below, such a vertical division of a temple is related not only to the 64-grid temple plan but is also characteristic to the four-part temple plan as in the AgniP. 42.5 and the PañcaRā.(Ha.). 13.5. The closeness of both types of con-

struction diagrams corroborate the hypothesis that the tripartite vertical division of a temple might have been applied disregarding the ground plan of a temple. As has already been suggested, to attest the textual records with available archeological data, it might be securely argued that the *sāmānya* system should be treated as a general framework including varieties of proportional measurement that supposedly emerged in temple architectural practice following construction regulations for building the *garbha*-shrine. I tend to believe that the 64-grid temple plan as decribed in the BṛSaṁ. and related texts takes its origins from the 8×8 ritual diagram introduced for the purpose of architectural planning in Chapter 53 by Varāhamihira. In the GaruḍaP., it was appropriated for the general system of temple measurement as a distinct temple ground plan. Thus it would be an overestimation to consider the 64-grid ground plan as a distinct feature of a unique mode of temple measurement.

1) BṛSaṁ. 56.10–16:

catuḥṣaṣṭipadaṃ kāryaṃ devatāyatanaṃ sadā |
dvāraṃ ca madhyamaṃ tasmin samadikṣthaṃ praśasyate ‖ 10 ‖
yo vistāro bhaved yasya dviguṇā tatsamunnatiḥ |
ucchrāyād yas tṛtīyāṁśas tena tulyā kaṭiḥ smṛtā ‖ 11 ‖
vistārārdhaṃ bhaved garbho bhittayo 'nyāḥ samantataḥ |
garbhapādena vistīrṇaṃ dvāraṃ dviguṇaṃ ucchritam ‖ 12 ‖
...
dvāramānāṣṭabhāgonā pratimā syāt sapiṇḍikā |
dvau bhāgau pratimā tatra tṛtīyāṁśaś ca piṇḍikā ‖ 16 ‖

So far most of the proportions of the temple as described by Varāhamihira were discussed in relation to the type of temple plan explored in the ViṣṇuDhaP. It should be pointed out that although the 64-grid is referred to both in the ViṣṇuDhaP. and the BṛSaṁ., it does not serve as a construction diagram to accomodate the ground-plan of a temple in either of these texts. In spite of this inconherence, the main proportions in the BṛSaṁ. refer to the general framework of the *sāmānya* system by establishing the height of a temple that is twice its width (11ab) and the width of the *garbha* that makes up half the total width of the temple (12ab) (fig. 7).

According to Bruno Dagens, the main difference in terminology from the ViṣṇuDhaP. is that of the meaning of *kaṭi*. The scholar opines against an interpretation identifying *kaṭi* with the 'middle' part of the temple, i.e. its ground floor or *garbha*-shrine. What underminds this meaning is the proportions of the doors as indicated in the BṛSaṁ.: given that the heigh of the *kaṭi* is a third of a part of the temple's total height (11cd), and the height of the door is half of the *garbha*'s width (12cd), which is half that of the temple, it comes to the height of the door being 3/8 of the *kaṭi* or 1/4 of the width of the temple. If under *kaṭi* is meant the *garbha*-shrine, the given proportions seem to be totally unaccounted for in practical architecture (2003, 111ff.).

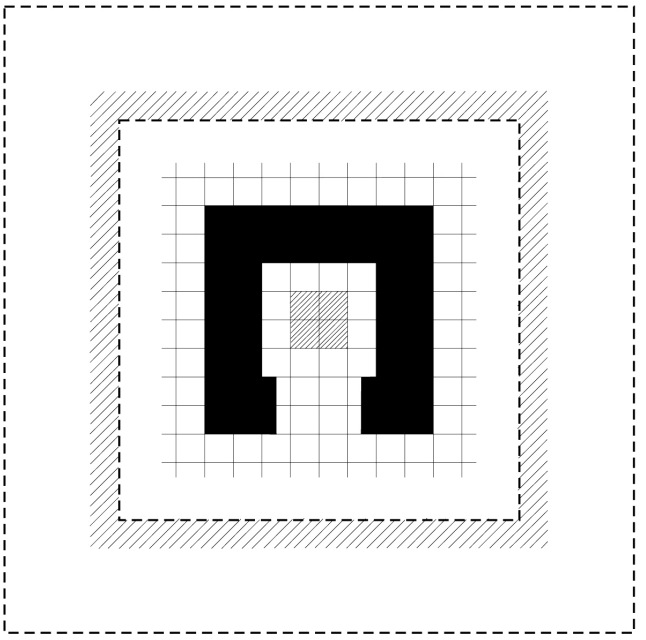

Fig. 7. The 64-grid temple plan of the *sāmānya* type according to BṛSaṁ. 56.10–16.

The interpretation of *kaṭi* by Dagens predominantly rests on his reading of the BṛSaṁ. 56.12cd, which states that 'the width of the door is a quarter of that of the *garbha*, while its height is twice its width' (*garbhapādena vistīrṇaṃ dvāraṃ dviguṇaṃ ucchritam*). Dagens consequently comes to the conclusion that 'as far as the B[ṛ] S[aṁ.] is concerned, the most satisfying hypothesis will be to consider that the word *kaṭi* designates the lower part of the temple, that is to say its base, probably a terraced one' (Dagens 2003, 113). As a supportive argument for *kaṭi* meaning platform stands the fact that nothing in the Varāhamihira's text is said about the base below the sanctum that the ViṣṇuDhaP. designates as *vasudhā*.

I, however, made an attempt in a previous paragraph to prove that emendation of *garbhapādena* to *garbhapādona-* as in the BhaviP. 1.130.19cd, which otherwise literally follows the BṛSaṁ., is more appropriate within the entire system of measurement of both texts. Such emendation entails allocating doors 3/4 of the width of the *garbha* and respectively reaching up to 3/4 the height of the temple wall—*kaṭi* if we assume its meaning from the ViṣṇuDhaP. and interpret the BṛSaṁ. 56.11cd as referring to the proportional tripartite division of the entire structure of which the *kaṭi* comprises one part.

As for Dagens's argument about the absence of reference to the temple platform in the BṛSaṁ., other than the possible '*kaṭi*', it could be explained on the analogy of absence of reference to the superstructure within the basic measurements of the 64-grid

temple plan. Both these structural elements—the platform and the superstructure—remain inexplicit most probably because information on the temple structure in these texts has served predominantly to explain the ritual provenance of the temple plan rather than its building practice. This hypothesis certainly requires more developed argumentation, but it should be noted that most of the plans of the 20 types of temples, including those—to put it in Dagens's words—'really intriguing' ones shaped like a Garuḍa, Nandin or Haṃsa, classified and described within the same chapter most probably took their prototypes from the accounts of the layouts of Vedic altars as described in the Śulbasūtras (cf. Kulkarni 1987). If so, it elucidates the intentions of Varāhamihira's detailed (although on an architectural basis hardly explainable) typology of temples along with limited interest in the structural intricacies of temples.

The final point which deserves mentioning with relation to the BṛSaṁ. is the Utpala's (10th c.) commentary concerning the kind of circumambulation passage which goes around the sanctum. Almost all the texts that are consulted in this article and describe the *sāmānya* system of measurement refer to a circumambulatory passage (with exception of the ViṣṇuDhaP., despite the fact that extant temples closely resembling accounts of this Purāṇa have this structural element) which has also been a distinct feature of one of the types of Gupta temples (Agrawala 1968). The BṛSaṁ., however, is considered by modern scholars as a text which makes no reference to such an circumambulatory passage (Shastri 1962; Singh 1981a), although Utpala, in particular, first in his commentary ad 56.12ab, interprets *bhittayo 'nyāḥ samantataḥ* as the walls that surround the temple by making up the circumambulatory passage (*bhramaṇa*). In another place, in the commentary ad 56.28cd, he explains the construction of the circumambulatory passage, which is intended to prevent external light from entering the sanctum. This circumambulatory passage is said to have the outer entrance to the temple from the north, thus maintaining the entrance to the *garbha* proper from the east unilluminated by the sunlight (Dagens 2003, 109, n. 14; 117, n. 28). Although the former commentary bears close reference to the text of Varāhamihira, the latter is a mere elaboration of the word *añjanarūpa*, 'with the obscure form', applied to the four last types of temples from the typology of the twenty. The structure of the ambulatory is unfortunately not attested in any other place in the BṛSaṁ., which would prove that Varāhamihira intentionally accounted for such a structure. What remains is to support the view of Dagens that the BṛSaṁ. provides some 'hints of the presence of an external circumambulatory passage built on the periphery of a terraced base and covered by a lean to roof resting on sanctum external wall' (2003, 119). To sum up the discussion on the structure of the ambulatory in the BṛSaṁ., the supportive accounts on the *sāmānya* system in the Purāṇas enables one to assume with some reservation the view that Utpala was likely updating the text,

but this update might have adhered to the architectural practice prevalent in around the 6th century which later was textualized by the vast corpus of the Purāṇas and thus made known to Utpala.

2) GaruḍaP. 1.47.1–5:

prāsādānāṃ lakṣaṇañ ca vakṣye śaunaka tac chṛṇu |
catuḥṣaṣṭipadaṃ kṛtvā digvidikṣūpalakṣitaṃ ‖ 1 ‖
catuṣkoṇaṃ caturbhiś ca dvārāṇi sūryyasaṁkhyayā |
catvāriṁśāṣṭabhiś caiva bhittīnāṃ kalpanā bhavet ‖ 2 ‖
ūrdhvakṣetrasamā jaṅghā tad ūrdhve dviguṇaṃ bhavet |
garbhavistāravistīrṇā śukānghriś ca vidhīyate ‖ 3 ‖
tat tribhāgena karttavyaḥ pañcabāgena vā punaḥ |
nirgamas tu śukāṅghreś ca ucchrāyaḥ śikharārddhagaḥ ‖ 4 ‖
caturddhā śikharaṃ kṛtvā tribhāge vedibandhanam |
caturthe punar asyaiva kaṇṭham āmūlasādhanam ‖ 5 ‖

In contrast to the the BṛSaṁ. and the ViṣṇuDhaP., the GaruḍaP. provides the method of constructing the *garbha* and its walls within the construction diagram. It is written that after the site is divided into 64 parts oriented to the cardinal and intermediate directions (1cd) there should be an arrangement of 4 squares where the pedestal of an image is intended to be placed, 12 squares for the passage (*dvārāṇi*)[24] around it (2ab), and 48 squares for the walls of the *garbha* (2cd) (fig. 8). Later the text introduces the way of dividing the outer wall by stating that the socle (*ūrdhvakṣetra*) equals in width the upper division of the wall (*jaṅghā*), which should rise two parts above the former (3ab). The length of the *śukāṅghri* is to be allotted for the width of the *garbha* (3cd), and is to be projected by either 1/3 or 1/5 of its length (4ab). The height of the *śukāṅghri* should correspond to a height of half the superstructure (4cd). Finally the division of the superstructure is described.

One of the most intriguing things in this brief description is the vertical division of the wall into the socle (*ūrdhvakṣetra*) and the upper wall (*jaṅghā*). Kramrisch (1996, 238, n. 20) has suggested that in the GaruḍaP. *jaṅghā* denotes the vertically divided lower part of the wall corresponding to the 'uprights' or shafts of pillars while the *ūrdhvakṣetra* refers to the upper division with its horizontal mouldings; she has also stated that the opposite meaning, namely that the *ūrdhvakṣetra* connotes the lower part of the wall, or *vedibandha*, is also applicable. My assumption is that the *jaṅghā* in the GaruḍaP. refers to the upper part of the wall above the socle (*ūrdhvakṣetra*). This suggestion, to my opinion, is attested first by the description in 3ab of the *jaṅghā* as being placed above the *ūrdhvakṣetra* (*ūrdhvakṣetrasamā jaṅghā tadūrdhve*), the latter meaning 'the elevating ground' rather than 'the upper place'. Secondly, the reference

[24] As George 1994, 88 points out, here the word *dvārāṇi* is used in its basic meaning of 'opening' and is interpreted as the open space between a central pedestal and surrounding walls.

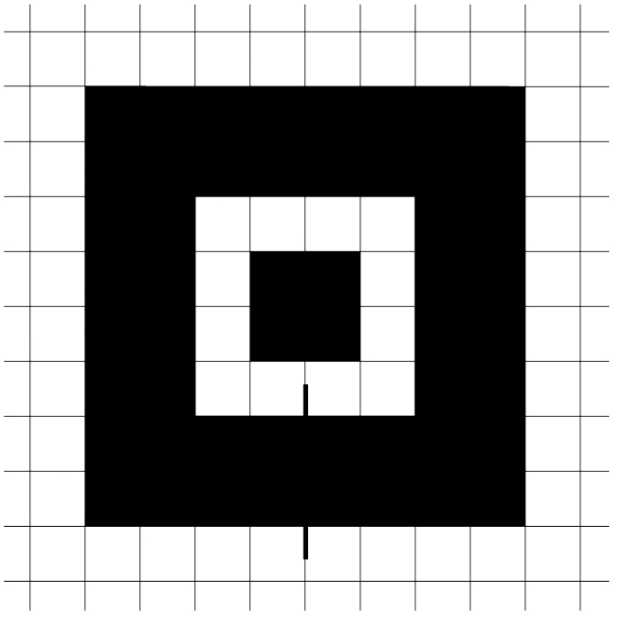

Fig. 8. The 64-grid temple plan of the *sāmānya* type according to GaruḍaP. 1.47.1–5.

to the division of the wall seems to be by no means accidental here. Although pilastered wall structures above the socle mouldings are a commonplace feature of the temples of northern India, the reference in the GaruḍaP. perhaps pertains to the structural character of the wall division rather then to its aesthetic appearance. As Michael W. Meister proves by using the Cālukya temples of the early 7th century at Aihole, Mahākūṭa and Paṭṭadakal as examples, this division of the wall entailed elevating the sanctum's floor which had been set in these temples above the *vedibandha*-like mouldings in contrast to the general practice of northern Indian temple architecture to construct the *vedibandha* as a base supporting the walls above the level of the sanctum's floor (Meister 1989; Michell 1975). With some reservation, it is therefore relevant to suggest that the term *ūrdhvakṣetra* in this fragment of the GaruḍaP. Is used to designate the socle as 'the elevating ground' and directly or not appeals to the architectural practice followed by the Calukyas and known in the 8th-century Kashmir or the early 9th-century central India. As a matter of fact, the elevated socle of the extant northern Indian temples occupies approximately 1/3 of the hight of the temple's *garbha*-shrine, which would closely match the dimensions of the GaruḍaP.[25]

[25] While developing this working hypothesis, it is tempting to speculate on the possible meaning of *kaṭi* as 'lower part of the wall' in the the BṛSaṁ. and the ViṣṇuDhaP. At least the commentary of Utpala on *kaṭi* as the part 'where the temple starts from above the steps' (comm. ad BṛSaṁ. 56.11), although equivocally, corroborates to this interpretation, though one should consent that the latter must have been more appropriate to the architectural practices of the Utpala times than to those of Varāhamihira. Leaving aside further speculations on the issue, what deserves mentioning is that

To conclude the interpretation of the fragment under consideration, it should be noted that by using the method of arrangement of structural elements within the constructional diagram, the GaruḍaP. sticks to the logic observed throughout the chapter in which different ground-plan arrangements are accounted for. The description of the 64-grid diagram is similarly characterised by establishing architectural proportion between the width of the *garbha* and its external wall. This method, as will be shown later, is applicable to all other varieties of the ground plans whatever their internal division. Although explicitely unstated, it can be deduced from the description of ground plan arrangements in the GaruḍaP. that the architectural proportion of the widths of the 64-grid diagram is also applied to the vertical structure of the temple. The main difference in treatment of the construction diagram in this Purāṇa and both other texts that explore the 64-grid plan is its application as a proportional device for the entire building rather than a mere diagram for horizontal arrangement of the temple scomplex. The newly suggested function of the ground plan supposedly highlights the shift from the ritual function of the diagram to its treatment as a proportional device in temple construction which became the established practice in the period of compilation of the Purāṇas.

Dimensions of the doors (*dvāramāna*)

It has been contended by Kramrisch that one of the features of the norm of measurement based on the 64-grid ground plan (termed Norm V in her classification) is that it combines two sets of proportional measurement, namely the modules of the entrance door and the height of the image (Kramrisch 1996, 238–9). After her, Singh has misleadingly argued for a specific variety of temple that took its doorway as a scale for determining the dimensions of the sanctum (1980, 183). In my opinion the hypothesis about a separate norm of proportional measurement based on the module of the door (*dvāramāna*) is cause for serious doubt even though, few texts provide meticulous descriptions of the doors and the GaruḍaP. 1.47.13cd–16 even posits it as a mode of proportional measurement (*dvāramāna*). Some explanatory notes for my argument are therefore required. Besides the GaruḍaP., the dimensions of the doors are also found in the ViṣṇuDhaP. 3.88, the AgniP. 42.19–21ab and 104.24–31, and the BṛSaṁ. 56.13–15 (the latter being reiterated with a slight omission in the BhaviP. 20–22ab), but in all these texts the description proves that the proportions of the doors were

the proportion of the *ūrdhvakṣetra* with relation to the remaining width of the wall as given in the GaruḍaP. is strikingly similar to the proportion of the *kaṭi* in the BṛSaṁ. 56.11cd as occupying 1/3 of the height of the temple (ground floor?) (*devatāyatanaṃ*). However one should asume that consistency of the meaning of *kaṭi* in the texts mentioned above remains obscure and requires additional textual evidence.

applicable to various types of temples without discrimination. I, therefore, further restrict myself to the analysis of the *dvāramāna* fragment in the GaruḍaP. Here, quite opposite to the notion of Kramrisch, the dimensions of the doors are inserted between the *liṅgamāna* and *kṣetramāna* modes of measurement, and thus is in no way related to the 64-grid temple ground plan.

1) GaruḍaP. 1.47.13cd–16:

liṅgamānaḥ smṛto hyeṣa dvāramānam athocyate ‖ 13 ‖
karāgraṃ vedavat kṛtvā dvāraṃ bhāgāṣṭamaṃ bhavet |
vistareṇa samākhyātaṃ dviguṇaṃ svecchayā bhavet ‖ 14 ‖
dvāravat pīṭhamadhye tu śeṣaṃ śuṣirakaṃ bhavet |
pādikaṃ śeṣikaṃ bhittir dvārārddhena parigrahāt ‖ 15 ‖
tad vistārasamā jaṅghā śikharaṃ dviguṇa[*ṃ*] *bhavet* |
śukāṅghriḥ pūrvavajjheyā nirgamocchrāyakaṃ bhavet ‖
uktaṃ maṇḍapamānan tu svarūpaṃ cāparaṃ vada ‖ 16 ‖

The text relates that the doors should be oriented to the region of the world from where the sunlight approaches (*karāgra*) and extend for 1/8 of a part of the temple's width (14ab). The height of the doors is double its width (14cd).[26] The doors should be installed at the middle of the pedestal of the image (15ab). The width of the wall equals its height, the superstructure being twice as high as the wall (16ab).[27]

The treatment of the passage as introducing the width of the doors as the module of proportional measurement, therefore, is completely incorrect and rests solely on the translation of the term *dvāramāna* as referring to a discrete mode of proportional measurement. Instead, the term *dvāramāna* and *maṇḍapamāna* in 16ef are used by the compilers of the Purāṇa not as technical terms to introduce the particular module of the width of the doors for proportional measurement of temple but rather describe the dimensions of both those structural elements—the doors and the pavilion—with regard to the measure of the width of the outer wall, which is common to the *sāmānya* system of proportional measurement. (It is most probably to the latter that the reference is made regarding dimensions of the *śukāṅghri* and its projection in 16cd.) It might be therefore assumed on the basis of critical analysis of the dimensions of the doors (*dvāramāna*) that the latter pertains to a single system of proportional measure-

[26] The instrumental form *svecchayā* in 14d makes no sense and seemingly stands for *ucchraya* as in the ViṣṇuDhaP. 3.88.2d *dviguṇocchrayam* with reference to the measure of height (cf. *dvāraṃ dviguṇaṃ ucchritam* in the BṛSaṁ. 56.12cd and the BhaviP. 1.130.19cd).

[27] Given that the width of the doors makes up 1/8 of the width of the outer wall, Singh's interpretation of *tad vistārasamā jaṅghā* in 14ab as referring to the height of the wall (*jaṅghā*) being proportional to the width of the doors (when *tad* is taken to refer to the width of the doors) is totally misleading (see Singh 1980, 184). My contention is that *tad* here refers to the width of the outer wall, and the height of the superstructure is proportionally twice as high as the former.

ment termed *sāmānya*, which from the architectural module of the width of the outer wall of a *garbha*-shrine establishes proportions for the entire temple structure.

Planning according to the dimension of an image (*liṅgamāna*)

The mode of proportional measurement which takes its module from the height of the main cult object (*liṅga*, *pratimā*) is called *liṅgamāna*. Its descriptions are found in the MatsyaP. 269.7cd–14ab and ViśvaKaPra. 6.62–68, and in the AgniP. 42.9cd–14 and 21cd–23ab, PañcaRā.(Ha.). 13.9cd–14 and 21cd–22 and GaruḍaP. 1.47.11–13ab. Both text groups have almost identical renderings of the mode, while the GaruḍaP. provides slightly different proportions for the temple.

The module of proportional measurement taken from the image has been misleadingly considered by Kramrisch as contrasting with the architectural module—the outer width of the wall of the temple (Kramrisch 1996, 237). I will attempt to prove, however, that the height of the image serves as a measure for proportioning the *garbha*-shrine only, while the remaining structure of the temple derives its proportions from the linear measure of the width of the *garbha*-shrine as in the *sāmānya* system.

1) MatsyaP. 269.7cd–14ab:

tathā 'nyaṃ tu pravakṣyāmi prāsādaṃ liṅgamānataḥ ‖ 7
liṅgapūjāpramāṇena kartavyā pīṭhikā budhaiḥ |
piṇḍikārdhena[28] *bhāgaḥ syāt tan mānena tu bhittayaḥ* ‖ 8
bāhyabhittipramāṇena utsedhas tu bhavet punaḥ |
bhittyucchrāyāt tu dviguṇaḥ śikharasya samucchrayaḥ ‖ 9
śikharasya caturbhāgāt kartavyā ca [or *śikharārdhasya cārdhena vidheyā tu*] *pradakṣiṇā* |
pradakṣināyās tu samas tv agrato maṇḍapo bhavet ‖ 10
tasya cārdhena kartavyas tv agrato mukhamaṇḍapaḥ |
prāsādān nirgatau kāryau kapolau [or *kapālau*] *garbhamānataḥ* ‖ 11
ūrdhvaṃ bhittyucchrayāt tasya mañjarīṃ tu prakalpayet |
mañjaryāś cārdhabhāgena śukanāsāṃ prakalpayet ‖ 12
ūrdhvaṃ tathā 'rdhabhāgena vedībandho bhaved iha |
vedyāś coparī yaccheṣaṃ kaṇṭhaś cāmalasārakaḥ ‖ 13
evaṃ vibhajya prāsādaṃ śobhanaṃ kārayed budhaḥ |

According to the MatsyaP. and ViśvaKaPra., the ground plan of the main temple is construed by fixing the width of the pedestal (*pīṭhika*) equal to the height of the *liṅga* (8ab). The thickness of the walls is said to be half the width of the pedestal,[29]

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[28] Cf. ViśvaKaPra. 6.63ab: *pīṭhikārddhena.*

[29] I emend *piṇḍikā* in the MatsyaP. 269.8c to *pīṭhikā* on the basis of the term for 'the pedestal' used in the previous line (269.8ab) as well as the more consistant rendering in the *ViśvaKaPra.* 6.63ab: *pīṭhikārddhena bhāgaḥ syāt tan mānena tu bhittayaḥ* 'The walls should be made at the mea-

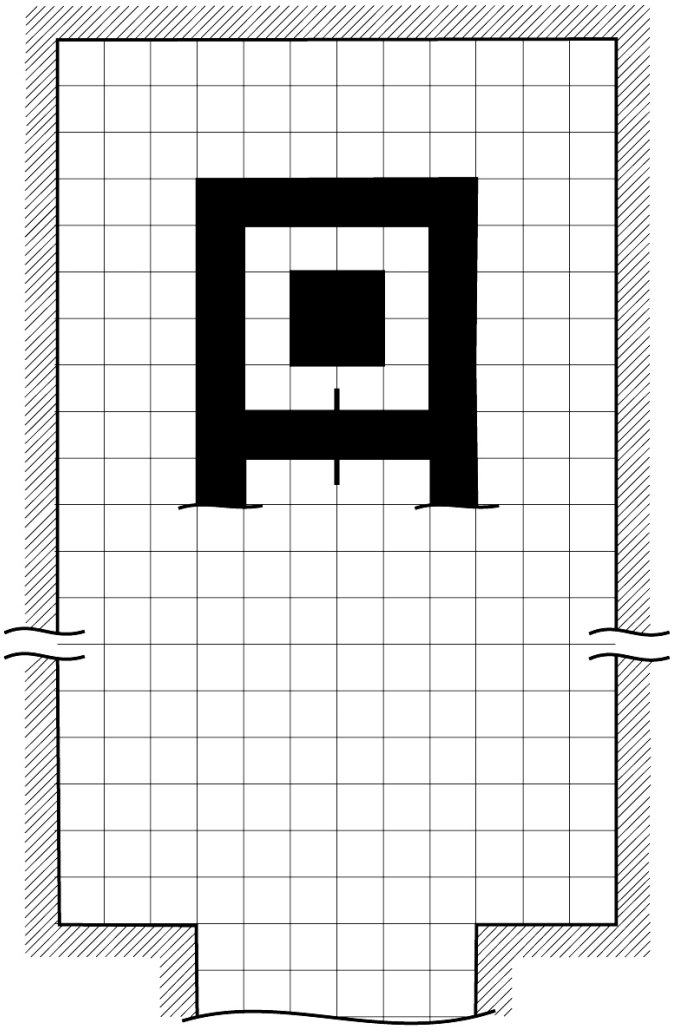

Fig. 9. Temple plan based on the *liṅgamāna* mode of measurement according to MatsyaP. 269.7cd–14ab.

while the height of the outer wall should be made equal to its width (8cd–9ab). Both texts omit the dimensions of the *garbha* proper or the *garbha*-passage around the pedestal, which are provided by the AgniP. and PañcaRā.(Ha.). The latter texts mention the passage around the pedestal, called here *garbha*, being half of the width of the

sure of half [the width] of the pedestal'. The argument of Kramrisch 1996, 243, n. 32 that the 'border-space' of the *garbha* around the pedestal is meant by *piṇḍikā* in the MatsyaP. is not attested by the measurements in the text. The proportioning of the walls as being half the width of the 'border space' seems illogical since the dimension of the very 'border space' is not mentioned at all. If not an orthographical mistake, *piṇḍikā* in the MatsyaP. 269.8c may be used as a synonym for *pīṭhikā* (the term used in the AgniP. and PañcaRā.(Ha.).) both meaning 'the pedestal'.

pedestal—the measure prescribed for the thickness of the walls also.[30] Transferring the aforementioned proportions to a construction diagram, the 6-part temple plan is produced. The remaining structure of a temple is generated on the basis of the proportion between the height of the walls and the superstructure, the ratio of which is 1:2.

The MatsyaP. and the ViśvaKaPra. prescribe that the *garbha*-shrine is surrounded by a circumambulatory passage (*pradakṣiṇā*).[31] Its width is commensurate with 1/4 of the superstructure (10ab), the latter being twice the height of the wall (9cd), which means that the circumambulatory passage equals 1/2 of the height of the wall. In front of the temple surrounded by the *pradakṣiṇā*, a hall (*maṇḍapa*) corresponding in width to the *pradakṣiṇā* is to be built (10cd). In front of the latter, half its size, the entrance-hall (*mukhamaṇḍapa*) is to be made (11ab). The AgniP. and the PañcaRā. (Ha.)., however, omit the dimensions of the *maṇḍapa* and derive the dimensions of the *mukhamaṇḍapa* from the height of the superstructure.[32] The MatsyaP. continues by saying that at the entrance to the shrine two porch walls (*kapolau*/*kapālau*) are to be constructed at a distance from each other of the width of the *garbha* (11cd) (fig. 9).[33]

It is highly informative that the MatsyaP. and the ViśvaKaPra. describe the superstructure rising from the walls.[34] It proves that the *pradakṣiṇā* mentioned above in the text is meant to be covered by a separate sloping roof. As has already been suggested, this type of temple with a closed circumambulation passage (*sāndhāra*) is attested by extant buildings: the Gupta temples, such as Viṣṇu temple at Deogarh and Pārvatī temple at Nacnā; early Calukya temples, such as Galaganātha temple in Paṭṭadakal; etc.

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[30] AgniP 42.10cd: *garbhas tu piṇḍikārddhena garbhamānās tu bhittaya* 'The *garbha* [i.e., the *garbha*-passage around the pedestal] is to be half of the pedestal, while the walls are of the measure of the *garbha*[-passage]'.

[31] Termed *bhramaṇa* in the texts of the AgniP. group.

[32] The proportions of the *mukhamaṇḍapa* in the AgniP. and the PañcaRā.(Ha.). suggest a type of temple without the *maṇḍapa*, though it is possible that both texts merely omit one line from a source common to all the texts discussed herein.

[33] Vasudeva S. Agrawala 1963, 367 relates *kapolas* with the central offset and the one which flanks it within the wall of the shrine and deliberately associates them with the *ratha* and *pratiratha* or *bhadra* and *pratibhadra* of the shrine with five offsets (*pañcaratha*). Such a method of offsetting is certainly found in medieval Hindu temples, but is hardly attested by the text under discussion. Therefore following Singh, Singh 1983, 57, n. 25, I tend to treat *kapola*/*kapāla* as an amendment for *kapilī*, the wall projecting in front of the *garbha*-shrine framing a vestibule (see EITA, 402), of which the dual form in the text is indicative. It should be noted that in the ViśvaKaPra. 6.66cd *kapotau* instead of *kapolau* is found, most probably due to the orthographic similarity of Sanskrit *ta* and *la* although this has nothing to do with the intention of using the term *kapota*, 'roll cornice' here. Kamrisch, however, leaves unexplained the places in all the texts under consideration where the term *kapola*/*kapāla* is met.

[34] MatsyaP. 12ab: *ūrdhvaṃ bhittyucchrayāttasya mañjarīṃ tu prakalpayet* 'The superstructure should be made rising from the walls'.

2) AgniP. 42.9cd–14, 42.21cd–23at:
mānena pratimāyā vā prāsādam aparaṃ śṛṇu ‖ 9 ‖
pratimāyāḥ pramāṇena karttavyā piṇḍikā śubhā |
garbhas tu piṇḍikārddhena garbhamānās tu bhittayaḥ ‖ 10 ‖
bhitterāyāmamānena utsedhan tu prakalpayet |
bhittyucchrāyāt tu dviguṇaṃ śikharaṃ kalpayed budhaḥ ‖ 11 ‖
śikharasya tu turyyeṇa bhramaṇaṃ parikalpayet |
śikharasya caturthena agrato mukhamaṇḍapam ‖ 12 ‖
aṣṭamāṁśena garbhasya rathakānān tu nirgamaḥ |
paridher guṇabhāgena rathakāṁs tatra kalpayet ‖ 13 ‖
tat tṛtīyeṇa [or °*turīyeṇa*] *vā kuryyād rathakānān tu nirgamam* |
vāmatrayaṃ sthāpanīyaṃ rathakatritaye sadā ‖ 14 ‖
...
prāsādasya caturthāṁśaiḥ prākārasyocchrayo bhavet ‖ 21 ‖
prāsādāt pādahīnas tu gopurasyocchrayo bhavet |
pañcahastasya devasya ekahastā tu pīṭhikā ‖ 22 ‖
gāruḍaṃ maṇḍapañ cāgre ekaṃ bhaumādidhāma ca |

In addition to the *liṅgamāna* mode explored in the MatsyaP. group of texts, the AgniP. and the PañcaRā.(Ha.). provide measurements for the projections of the niches (*rathaka*) within the offsets of the walls. The dimensions of these projections are reported to be 1/8 the width of the *garbha* (13ab) and installed within the 1/3 part (*guṇabhāga*) of the wall (13cd).[35] From the texts it might be suggested that projection of the niches, superimposed with a curved trefoil (*vāmatraya*), were supposed to be 1/3 (or 1/4) the height of the wall (14).[36]

After a brief description of the outlining method of the superstructure and the doors of the temple (42.15–21cd), the AgniP. provides measurements for the temple complex that might be related to the proportions of the *liṅgamāna* mode. Of particular interest is the notion of the walled enclosure (*prākāra*), the height of which is commensurate to 1/4 of the temple height (21cd), which corresponds to 2/3 of the height of its wall. Curiously for the northern Indian temples, the entrance gates (*gopura*) are prescribed as the height of 1/4 of a part less than the height of the entire temple (22ab). Within the enclosure in front of the temple, the Gāruḍa-maṇḍapa is constructed, which is suggestive of the structure of a Vaiṣṇava temple (23ab). Finally, with correspondence to the main cult object, the proportions of the height of its pedestal and the icon itself should correspond to ratio of 1:5 measuring in *hasta* (22cd) (fig. 10).

The extant temples corresponding to these descriptions can be associated only relatively, but the mixture of the elements from northern and southern architectural

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[35] Cf. wording in the AgniP. 104.7cd: *paridhis tryaṁśako madhye rathakāṁs tatra kārayet* ‘One should cause niches (*rathakas*) to be made in the middle 1/3 part of the wall (*paridhis*)’ (see George 1994, 95).

[36] It is probable that *tṛtīyeṇa* (or *turīyeṇa*) here refers to the vertical measurement of the wall, which would corroborate the logic of locating the *rathakas* within the offset of the wall, whereas the horizontal division of the wall with regard to the *rathaka* was referred to in the previous line.

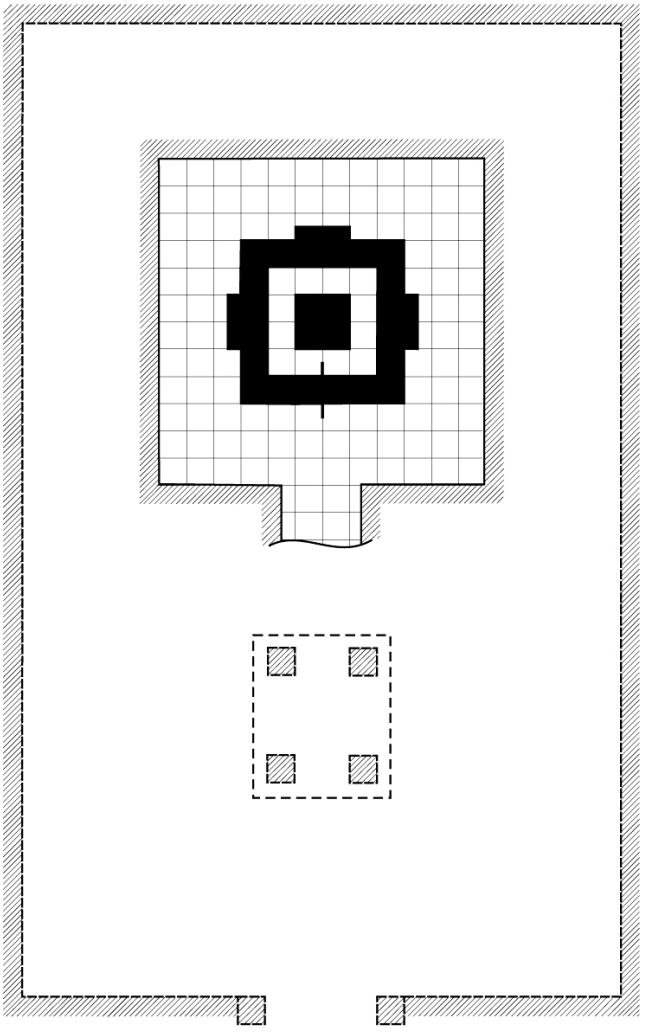

Fig. 10. Temple plan based on the *liṅgamāna* mode of measurement according to AgniP. 42.9cd–14.

traditions are well known in the architecture of the Calukyas, especially in their territories of Āndhradeśa, where a number of enclosured temple complexes were built from the late 7th century, the Saṅgamēśvara temple in Kūḍavēli (8th c.) being a single example. The proportions of its walled enclosure (c. 15 ft.) in relation to the height of the temple (c. 68 ft.), as well as a former gateway within the *prākāra*, closely correspond to the description of the ch. 42 in the AgniP. (EITA 329–30).

3) GaruḍaP. 1.47.11–13ab:

liṅgamānam atho vakṣye pīṭho liṅgasamo bhavet |
dviguṇena bhaved garbhaḥ samantācchaunaka dhruvam ‖
tadvidhā ca bhaved bhittir jaṅghā tad vistarārdhagā ‖ 11 ‖
dviguṇaṃ śikharaṃ proktaṃ jaṅghāyāś caiva śaunaka |

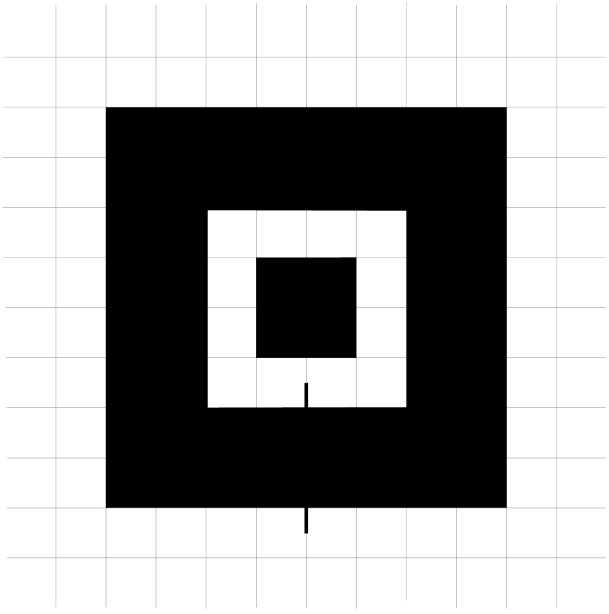

Fig. 11. Temple plan based on the *liṅgamāna* mode of measurement according to GaruḍaP. 1.47.11–13ab.

pīṭhagarbhāvaraṃ karma tan mānena śukāṅghrikām ‖ 12 ‖
nirgamas tu samākhyātaḥ śeṣaṃ pūrvavadeva tu |

In contrast to the other texts, the GaruḍaP. provides different proportions for the ground plan of the *garbha*-shrine. The width of the pedestal is reported to equal the height of the *liṅga*, while the *garbha* around it is twice its size (11ab–cd). Further, the thickness of the wall is equal to the height of the *liṅga* (11e) and the height of the wall (*jaṅghā*) equals one-half of a part of the width of the wall (11f). *Jaṅghā* also serves as a module for proportioning the superstructure, the latter being twice as high as the *jaṅghā* (12ab). Finally, the antefix above the vestibule in front of the *garbha*-shrine (*śukāṅghrikā*; the term stands here for *śukanāsa*) should be as wide as the *garbha* with the pedestal below (12cd).

After giving the proportions of the *garbha* and its walls, for the dimensions of the remaining structures the text refers to the aforementioned characteristics of the *sāmānya* type.[37] Notably, the *liṅgamāna* mode in the GaruḍaP. reiterates the 64-grid plan described earlier in 1.47.1–5 of this very text (fig. 11; cf. fig. 8).

It is informative that most of the texts discussed above explore the *liṅgamāna* mode of proportional measurement with relation to the proportions of the *garbha*-

[37] Cf. GaruḍaP. 1.47.13ab ‘Its elevation, however, should follow the previous description, and the rest [is made] according to what has been said previously’. The previous description which the verse refers to is perhaps that of 4cd from this very chapter, which states that ‘the height of the *śukāṅghri* should reach a height of half the superstructure’.

shrine only, while the remaining structure of the temple is moduled with the help of the width of the wall. It seriously undermines the notion that *liṅgamāna* deals with a distinctive non-architectural module; *liṅgamāna* should instead be treated as a mode of proportional measurement which was applied when the space of the *garbha* had to be arranged with regards to the dimensions of an extant image. It is natural that the dimensions of the image created special proportions of the *garbha* intended to accommodate it. Accordingly, in the cases of a particular image being produced or having been brought from elsewhere to the shrine that was intentionally constructed to house it, the *liṅgamāna* mode should have been applied. In fact this approach corroborates the view that the ground plan attained by proportioning the *garbha*-shrine according to the height of an image can be treated as an extension of the *sāmānya* system.

Planning according to dimensions of a sanctum (*garbhamāna*)

Arranging a temple plan and establishing the proportional measurement of a temple according to the dimensions of the *garbha* is given only in the MatsyaP. 269.14cd–20 and the ViśvaKaPra. 6.69–74, where it is termed the third variety of temple.[38]

1) MatsyaP. 269.14cd–20:

athānyañ ca pravakṣyāmi prāsādasyeha lakṣaṇam ‖ 14 ‖
garbhamānapramāṇena prāsādaṃ śṛṇuta dvijāḥ |
vibhajya navadhā garbhaṃ madhye syālliṅgapīṭhikā ‖ 15 ‖
pādāṣṭakaṃ tu ruciraṃ pārśvataḥ parikalpayet |
mānena tena vistāro bhittīnāṃ tu vidhīyate ‖ 16 ‖
pādaṃ pañcaguṇaṃ kṛtvā bhittīnām ucchrayo bhavet |
sa eva śikharasyāpi dviguṇaḥ syāt samucchrayaḥ ‖ 17 ‖
caturdhā śikharaṃ bhajya ardhabhāgadvayasya tu |
śukanāsaṃ prakurvīta tṛtīye vedikā matā ‖ 18 ‖
kaṇṭham āmalasāraṃ tu caturthe parikalpayet |
kapola[or *kapāla*°]*yos tu saṁhāro dviguṇo ʹtra vidhīyate* ‖ 19 ‖
śobhanaiḥ patravallībhir aṇḍakaiś ca vibhūṣitaḥ |
prāsādo ʹyaṃ tṛtīyastu mayā tubhyaṃ niveditaḥ ‖ 20 ‖

Following this method, the *garbha* is divided into nine parts with the pedestal of the *liṅga* placed at the center (15cd). The remaining eight parts (*pāda*) should be arranged around the pedestal (16ab). Further, allocating one part for the width of the walls (16cd), the five-part temple plan is produced. The width of the wall provides the measure for its height (17ab), while the height of the superstructure should be twice

[38] MatsyaP. 269.20cd: *prāsādo ʹyaṃ tṛtīyas tu mayā tubhyaṃ niveditaḥ* ‘this is the third [variety] of a temple of which you were told by me’.

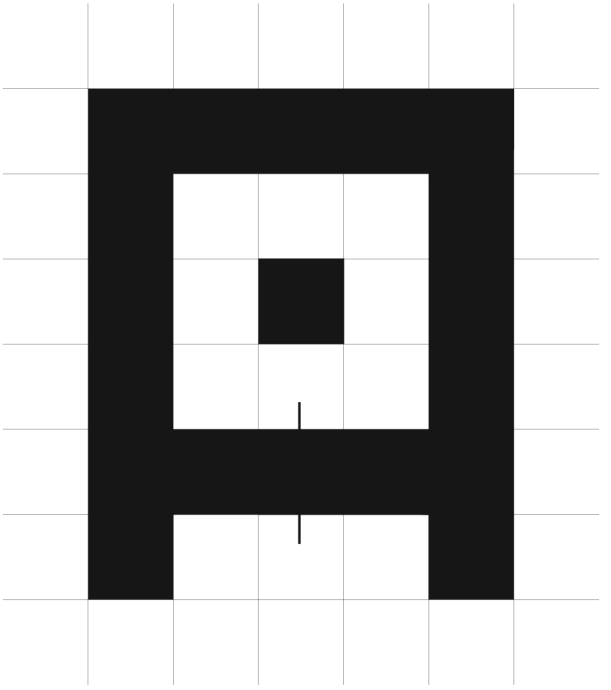

Fig. 12. Temple plan based on the *garbhamāna* mode of measurement according to MatsyaP. 269.14cd–20.

the height of the wall (17cd). In front of the *garbha*, a pair of projecting walls (*kapola/kapāla*) are to be constructed at the measure of two parts (19cd) (fig. 12).[39]

From this description of the *garbhamāna* mode of measurement, it is clear that the text accounts for the five-part plan which is also met in the AgniP. 104.2cd–3ab. In both cases the identical proportioning of the width of the outer and inner walls of the temple as well as the dimension of the pedestal is provided without any innovation to the general (*sāmānya*) measurement system.

In contradiction to the *liṅgamāna* mode, the special mention of the *garbhamāna* is perhaps related to the requirement of measuring the *garbha* and disregarding the particular image to be installed in it. Still it is not relevant to consider the *garbhamāna* as a general method of proportional measurement; it is rather a practically attained mode of measurement which explored the width of the inner wall of the *garbha*-shrine as in other variations of the *sāmānya/sarvasādhāraṇa* type.

[39] Here the meaning of *kapola/kapāla* as the porch wall is accepted on the example of the wording in the MatsyaP. 269.11cd.

Ground plan arrangement according to dimensions of the site (*kṣetramāna*)

In the MatsyaP. 269.21–25, the ViśvaKaPra. 6.75cd–80ab, and the GaruḍaP. 1.47.17–18 another supposed variation of the *sāmānya* measurement system is provided, which has been termed Norm IV by Kramrisch (1996).

1) MatsyaP. 269.21–25:

sāmānyam aparaṃ tadvat prāsādaṃ śṛṇuta dvijāḥ |
tribhedaṃ kārayet kṣetraṃ yatra tiṣṭhanti devatāḥ ‖ 21 ‖
rathāṅkastena mānena bāhyabhāgavinirgataḥ |
nemī pādena vistīrṇā prāsādasya samantataḥ ‖ 22 ‖
garbhaṃ tu dviguṇaṃ kuryāt tasya [or *bhittiś ca triguṇā/dviguṇā kāryā tasyā*] *mānaṃ bhaved iha* |
sa eva bhitter utsedhā dviguṇaḥ śikharo mataḥ ‖ 23 ‖
prāggrīvaḥ pañcabhāgena niṣkāsas tasya cocyate |
kārayet suṣiraṃ tadvat prākārasya tribhāgataḥ ‖ 24 ‖
prāggrīvaṃ pañcabhāgena niṣkāṣeṇa viśeṣataḥ |
kuryād vā pañcabhāgena prāggrīvaṃ karṇamūlataḥ ‖ 25 ‖

GaruḍaP. 1.47.17–18:

traivedaṃ kārayet kṣetraṃ yatra tiṣṭhanti devatāḥ |
itthaṃ kṛtena mānena bāhyabhāgavinirgatam ‖ 17 ‖
nemiḥ pādena vistīrnā prāsādasya samantataḥ |
garbhantu dviguṇaṃ kuryān nemyā mānaṃ bhavediha |
sa eva bhitterutsedho śikharo dviguṇo mataḥ ‖ 18 ‖

According to this mode of proportioning, the site is to be arranged by a three-fold division in width and breadth (21cd), thus making a 3-part temple plan.[40] On the external wall at the width of one measure-part, there are niches (22ab). The platform-plane (*nemī*) extends by 1/4 of the shrine's width around it (22cd). The *garbha* should be made twice the size of the platform-plane (23ab); the height of the walls is the same measure (23c). The height of the wall being less than its width is a distinct feature of this mode of measurement. It means that the walled *garbha* is not cubical as usually accounted for in other modes of measurement. The height of the superstructure is said to be twice the height of the wall (23d). The GaruḍaP. ends its description of this mode with the dimensions of the superstructure, while two other texts add the proportions of the walls of the porch (*prāggrīva*). It is stated to project at 1/5 of the

[40] Emendation in the GaruḍaP. 1.47.17a of *tribhedaṃ* (three-part) for *traivedaṃ* (thrice of the number of the Vedas, i.e. 3×4=12) is most probably an orthographical mistake. Theoretically such a division is probable in a 12-part plan based on a diagram of 144 grids (cf. Sarvakāmaprada diagram in *Pauṣkarasaṁhitā* 5.57–62; see Apte 1991), but none of the texts under discussion refer to a more elaborate plan that that of 64 grids.

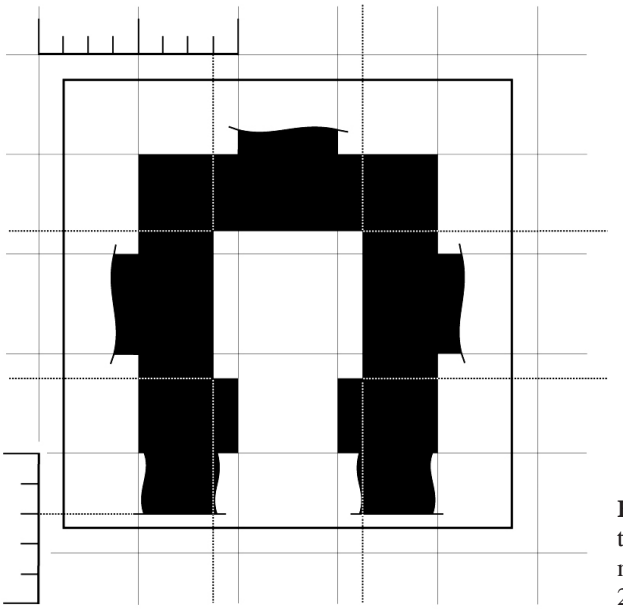

Fig. 13. Temple plan based on the *kṣetramāna* mode of measurement according to MatsyaP. 269.21–25.

superstructure (24ab), which equals 2/5 of the width of the *garbha*. Within the 1/3 of the enclosure of the *garbha*, an entrance should be made (24cd) (fig. 13).[41]

Reading 23ab as 'The *garbha* should be made twice of the size, here[after] [i.e. in this mode of measurement] its (*tasya*) measure is to be taken [as a module]' is problematic due to the uncertainty of the object referred to as 'its' and, subsequently, the basis of the measure of *dviguṇaṃ* ('twice of the size'). Kramrisch (1996, chart 1) and Singh, Singh (1983, 58) take it as referring to the measure of a part from the triple division of the width of the temple site (*kṣetra*), which would suggest that two parts had to be allotted for the width of the *garbha*. The wording in the ViśvaKaPra. and the GaruḍaP. does not corroborate this view, however. Both these texts explicitly name the *garbha* being measured by taking as a module the width of the *nemī*.[42] It is identification of the basic measure of the *garbha* with the width of the *nemī* that enables the verse to be interpreted as introducing a module of measurement which is derived from the width of the site of the temple. This also explains why the division of the site (*kṣetra*) is called another (*apara*) variation of the measurement of the

[41] The ViśvaKaPra. 6.79ab, instead, puts the line in the following manner: *kārayecchikharaṃ tadvat prākārasya vidhānataḥ* 'Likewise the superstructure should be build upon the enclosure according to the measurements [stated above]'.

[42] See ViśvaKaPra. 6.77cd: *garbhaṃ tu dviguṇaṃ kuryān nemimānaṃ bhi*[*a?*]*ved iha* and GaruḍaP. 1.47.18cd: *garbhan tu dviguṇaṃ kuryān nemyā mānaṃ bhaved iha* 'The *garbha* should be made twice as wide taken here for the unit of measurement that of the *nemī*'.

sāmānya temple in MatsyaP. 269.21a but is missing in the other texts under consideration. The the reference to 'another' seems consistant if referring to *sāmānya*, or the system of measurement which uses the width of the compond as its proportional module, since *kṣetramāna* introduces another mode of measurement which is executed with the module of the width of the platform-plane derived from the width of the temple site.

Conclusions

As has been proved by reconsidering the passages in the Purāṇas and related early sources of Indian temple architecture, the *sāmānya* or *sarvasādhāraṇa* system of proportional measurement accounted for in these texts encompasses a variety of ground plan arrangements, but it would still be irrelevant to consider the former as a normative system of measurement as Kramrisch has supposed. It is noteworthy that all of these modes explore linear measure derived from the width of the main temple, its sanctum, or the pedestal of the image worshipped. It suggests that the *sāmānya*/*sarvasādhāraṇa* system of investing the measurements of a temple with the proportions of the *garbha*-shrine was established to integrate diverse types of *garbha*-shrines. The texts as a consequence differentiate among the arrangements of the 4-part, 5-part or 6-part ground plans of the *garbha*-shrine, which can be accommodated within the 64-grid constructional diagram that seemingly follows the practice of applying the 64-grid *maṇḍala* for ritual. It is thus relevant to contend that the construction diagrams appropriated for the temple ground plans most probably took their prototypes from the layouts and construction practices of the Vedic altars as accounted for in the Śulbasūtras. Reconsideration of the descriptions of temple plans contributes to the hypothesis that, to put it in Michael W. Meister's words, the temple in north India functions as *vedī* or an altar for ritual (Meister 1989, 168). It is most probable (although further inestigation into the matter is a desideratum) that by arranging the plans of the temples the architects of early temples appropriated the practices of Vedic altar building.

To sum up the cultural arguments offered throughout the paper, my contention is that the Purāṇas and related texts on early north India Nāgara architecture highlight the building practices of the period when the Nāgara style experienced a phase of identity formation and consequently expanded into a variety of forms classified by the authors of the texts mentioned above. This identity formation was propelled by the establishment of sectarian temple worship for which Vedic legitimisation was of topmost importance. Application of not only ritual diagrams but also the geometry of Vedic altars as made clear by the typologisation of temples according to their ground plan forms proves the hypothesis of the ritual provenance of the planning devices used in the architectural practices of north Indian temples.

APPENDIX

Other fragments of the texts cited in the article

Variations of the *Sāmānya/sarvasādhāraṇa* system of measurement

GaruḍaP. 1.47.6–10:

athavāpi samaṃ vāstu kṛtvā ṣoḍaśabhāgikam |
tasya madhye caturbhāgam ādau garbhan tu kārayet ‖ 6 ‖
bhāgadvādaśikāṃ bhittiṃ tataś ca parikalpayet |
caturthabhāgena bhittīnām ucchrāyaḥ syāt pramāṇataḥ ‖ 7 ‖
dviguṇaḥ śikharocchrāyo bhittyucchrāyāc ca mānataḥ |
śikharārddhasya cārddhena vidheyāstu pradakṣiṇāḥ ‖ 8 ‖
caturdikṣu tathā jñeyo nirgamas tu tathā budhaiḥ |
pañcabhāgena saṁbhajya garbhamānaṃ vicakṣaṇaḥ ‖ 9 ‖
bhāgam ekaṃ gṛhītvā tu nirgamaṃ kalpayet punaḥ |
garbhasūtrasamo bhāgād agrato mukhamaṇḍapaḥ |
etat sāmānyam uddiṣṭaṃ prāsādasya hi lakṣaṇam ‖ 10 ‖

64-grid temple plan

BhaviP. 1.130.17–23ab:

catuḥṣaṣṭipadaṃ kuryād devatāyatanaṃ sadā |
dvāraṃ ca madhyamaṃ tasmin samadik saṁpraśasyate ‖ 17 ‖
yo vistāro bhavet tasya dviguṇā tatsamunnatiḥ |
ucchrāyas tu tṛtīyotha tena tulyā kaṭir bhavet ‖ 18 ‖
vistārārdhaṃ bhaved garbho bhinnayonyāḥ samaṁtataḥ |
garbhapādonavistīrṇaṃ dvāraṃ dviguṇam ucchritam ‖ 19 ‖
ucchrayāt pādavistīrṇā śākhātadvad uduṁbarī |
vistarāt pādapratimād bāhulyaṃ śeṣayoḥ smṛtam ‖ 20 ‖
nṛpaṃ ca saptanavabhiḥ śākhābhis tat praśasyate |
atha śākhācaturbhāge pratihārau niveśayet ‖ 21 ‖
śailamaṅgalyavihagaḥ śrīvṛkṣaḥ svastikair ghaṭaiḥ |
mānāṣṭamenabhāgena pratimā syāt sapiṇḍikā ‖ 22 ‖
dvau bhāgau pratimā tatra tṛtīyobhāgapiṇḍikā |

Dvāramāna

BṛSaṁ. 56. 12cd–15:

garbhapādena vistīrṇaṃ dvāraṃ dviguṇaṃ ucchritam ‖ 12 ‖
ucchrāyāt pādavistīrṇā śākhā tadvad udumbaraḥ |
vistārapādapratimaṃ bāhulyaṃ śākhayoḥ smṛtam ‖ 13 ‖
tripañcasaptanavabhiḥ śākhābhis tat praśasyate |
adhaḥ śākhācaturbhāge pratīhārau niveśayet ‖ 14 ‖
śeṣaṃ maṅgalyavihagaiḥ śrīvṛkṣaiḥ svastikair ghaṭaiḥ |
mithunaiḥ patravallībhiḥ pramathaiś copaśobhayet ‖ 15 ‖

AgniP. 42.19–21ab:

vistārād dviguṇaṃ dvāraṃ karttavyaṃ tu suśobhanam |
udumbarau tadūrddhvañca nyasecchākhāṃ sumaṅgalaiḥ ‖ 19‖
dvārasya tu caturthāṁśe kāryyau caṇḍapracaṇḍakau |
viṣvak senavatsadaṇḍau śikhorddhvoḍumbare śriyam ‖ 20 ‖
diggajaiḥ snāpyamānāntāṃ ghaṭaiḥ sābjāṃ surūpikām |

AgniP. 104.24–31:

dikṣu dvārāṇi kāryāṇi na vidikṣu kadācana |
piṇḍikā koṇavistīrṇā madhyamāntā hyudāhṛtā ‖ 24 ‖
kvacit pañcamabhāgena mahatāṅgarbhapādataḥ |
ucchrāyā dviguṇās teṣām anyathā vā nigadyate ‖ 25 ‖
ṣaṣṭyādhikāt samārabhya aṅgulānāṃ śatād iha |
uttamāny api catvāri dvārāṇi daśahānitaḥ ‖ 26 ‖
trīṇyeva madhyamāni syustrīṇyeva kanya sānyataḥ |
ucchrāyārddhena vistāro hyuchrāyo 'bhyadhikas tridhā ‖ 27 ‖
caturbhir aṣṭabhir vāpi daśabhiraṅgulais tataḥ [or *daśabhir vā guṇaiḥ śubhaḥ*] |
ucchrāyāt pādavistīrṇā viśākhās tad uduṁbare ‖ 28 ‖
vistarārddhena bāhulyaṃ sarveṣām eva kīrtitam |
dvipañcasaptanavabhiḥ śākhābhir dvāram iṣṭadaṃ ‖ 29 ‖
adhaḥ śākhācaturthāśe pratīhārau niveśayet |
mithunaiḥ pādavarṇābhiḥ [or *mithunair atha vallībhir*] *śākhāśeṣaṃ vibhūṣayet* ‖ 30 ‖
stambhaviddhe bhṛtyatā syāt vṛkṣaviddhe tvabhūtitā |
kūpaviddhe bhayaṃ dvāre kṣetraviddhe dhanakṣayaḥ ‖ 31 ‖

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