

Space and order in Prambanan

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Introduction

This essay presents new ideas regarding the plan of the 9th-century Prambanan temple complex and the number of its subsidiary shrines (*candi perwara*). Sometimes viewed as derived from the Somapura Mahāvihāra of Bengal, which was built by Dharmapāla (r. 770-810) of the Pāla dynasty (Rowland 1953), Prambanan is a *sarvatobhadra* temple with a terraced plan and a unique *maṇḍala* layout.

The historiography of Candi Prambanan is well summarized by Jordaan (1996). The largest temple compound dedicated to Śiva in Indonesia, the main complex has a size of 220×220 m which encloses the inner complex of size 110×110 m. The outer yard has 224 *candi perwara* temples (of size 6×6×14 m) in four descending terraces and within the inner yard is the Śiva temple which is

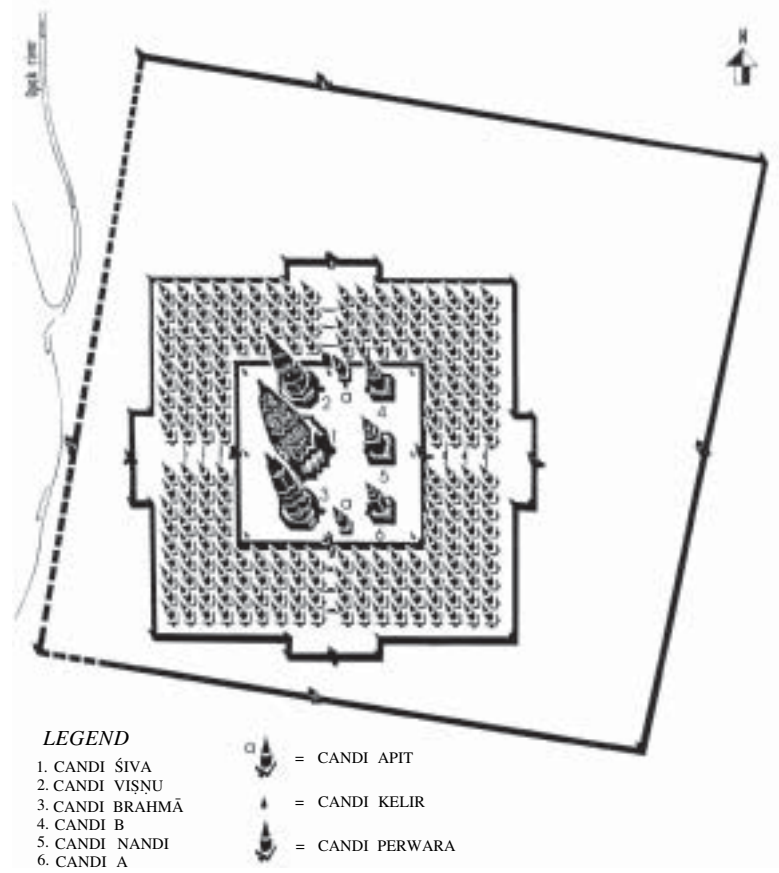


Fig.1: The Prambanan complex

flanked by temples to Viṣṇu at the north and to Brahmā at the south. Facing the Śiva temple is a subsidiary temple dedicated to Nandi, as is common for Śiva temples. Similar subsidiary temples face the Viṣṇu and Brahmā temples also, and although it is not certain what deities were originally installed there, they appear to have been Śiva and a Mahāyogi. The Śiva temple is 34×34×47 m in size, whereas its companion temples are 20×20×33 m.

Within the Śiva temple stands the image of Agastya to the south, Gaṇeśa to the west, Durgā Mahiṣāsūramardinī to the north, and images of Mahākāla and Nandīśvara to the east as doorkeepers. Durgā here is also called Loro Jonggrang, *Slender Virgin*. The temple is named after the Goddess by the local population, namely Candi Loro Jonggrang.

The Purāṇas explain Durgā (“Unassailable”) as emerging from the collective powers of the gods to fight Mahiṣāsura, the *asura* who has repeatedly defeated them. When seen as the consort of Śiva, she is the fierce aspect of Pārvatī. Since Durgā represents victory, her image commemorates a victory of the builder of the temple. The jar-born Agastya, who is also the star Canopus, is the teacher who planted the Vedic wisdom in a southern land.

The Śiva temple is on top of a terraced and richly decorated plinth, with stairs leading to the main entrance and those of side chapels. The terrace below is surrounded by another richly sculptured balustrade, with reliefs illustrating stories from the Rāmāyaṇa that continue on the terraces of the Brahmā and Viṣṇu temples. The details include Rāma slaying Bāli, the abduction of Sītā, the tender affection of Rāma and Sītā, Hanumān speaking to Sītā in the Aśoka garden, Rāma’s crossing to Laṅkā. The prominence to the Rāmāyaṇa indicates that Prambanan may also be taken to be dedicated to Rāma as the ideal king, and Śiva, Agastya, and Durgā, connected to Rāma in the Rāmāyaṇa and the Purāṇas, are glorified for having brought him victory.

In the *Devi Bhāgavata Purāṇa*, when Rāma is despondent of reaching Laṅkā and defeating Rāvaṇa, the sage Nārada advises him to call on Durgā for help and instructs him on how to worship her; this story is also found in the *Bṛhadharma Purāṇa* and the *Rāmāyaṇa* by Kṛttivāsa (fifteenth century). According to Vālmīki, during the battle with Rāvaṇa when Rāma was exhausted, Agastya inspires him by reciting the *Āditya-hṛdayam* hymn. After Laṅkā has been defeated, Rāma worships Śiva in the form of a sand *śivaliṅga* at Rāmeśvaram to seek his forgiveness for having killed Rāvaṇa.

There are also Kṛṣṇa reliefs on the balustrade that surrounds the Viṣṇu shrine. The exterior to the first sub-basement of the Śiva temple has reliefs that show the *karaṇas* (dance poses) from Bharata’s *Nāṭyaśāstra*.

Jordaan (1996:45-61) sees the temple as a representation of Mount Mandara, or Meru, suggesting that the inner courtyard was flooded to represent the Milky Ocean during ceremonies. As support he cites passages, put in the mouth of Hanumān, that seem to describe this temple in the Old Javanese Rāmāyaṇa (Kakawin Rāmāyaṇa).

This essay addresses questions related to the dimensions of the complex and the nature of its maṇḍala plan. It is shown that the sizes of the main temples are related to integer multiples of the standard measure of *dhanus* in India. We propose that the four terraces of the *candi perwara* shrines are the four concentric circles of deities around the central region in the Śrī Yantra (also called

Śrī Cakra) and their number equals the emanations associated with further Tantric ideas that were popular around the time the temple was built.

The basic measures and Prambanan dimensions

Both proportion and size, seen most clearly in the prescriptions related to the images, are important to the design of the Hindu temple (Kramrisch 1946). Recent studies have shown that the unit of *dhanus* has been used consistently in India in town planning and architecture for over 4,000 years, going back to the Harappan period. By considering the largest measure which leads to integer dimensions for the various parts of the Harappan age city of Dholavira, which was excavated in the 1990s (Bisht 1997, 1999), it was found that this measure is the same as the *Arthaśāstra* (300 BCE) measure of *dhanus* (bow) that equals 108 *aṅgulas* (fingers) (Kangle 1986; Danino 2008).

The measure of *dhanus* is seen to apply not only to the Mauryan and Gupta era structures (Balasubramaniam 2008), but even to more recent grid and modular measures in the town planning of Kathmandu Valley (Pant and Funo 2005). The measures used in ancient India are summarized in the table below.

Measure	aṅgulas	centimeters
<i>aṅgula</i>	1	1.763
<i>vitasti</i> (<i>tāla</i>)	12	21.156
<i>pāda</i>	14	24.682
<i>aratni</i> , <i>P-hasta</i>	24	42.312
<i>C-hasta</i>	28	49.364
<i>F-hasta</i>	54	95.202
<i>daṇḍa</i>	96	169.248
<i>dhanus</i>	108	190.404

The three different *hasta* measures have been called the Prājāpatya (*P-hasta*), commercial (*C-hasta*), and forest (*F-hasta*) by Balasubramaniam (2009), and used variously in different situations. Here we are concerned primarily with *dhanus*, although we will also encounter *pāda* and *aratni*.

a. Dhanus measure in town planning and architecture

With the measure of *dhanus* (D) of 1.9404 m, the dimensions of Mohenjo-Daro's acropolis turn out to be 210×105 D; Kalibangan's acropolis turn out to be 126×63 D. The dimensions of the lower town of Dholavira are 405×324 D; the width of the middle town is 180 D; and the inner dimensions of the castle are 60×48 D (Danino 2008). The sum of the width and length of the lower town comes

to 729 which is astronomically significant since it is 27×27 , and the width 324 equals the *nakṣatra* year 27×12 (Kak 2009).

When considering temples and sacred buildings of historical times, we note that the *Vāstu Śāstra* claims that the structure of the building mirrors the emergence of cosmic order out of primordial chaos through the act of measurement. The universe is symbolically mapped into a square that emphasizes the four cardinal directions. It is represented by the square *vāstupuruṣamaṇḍala*, which in its various forms is the basic plan for the house and the city. There exist further elaborations of this plan, some of which are rectangular.

The Somapura Mahāvihāra of Paharpur has dimensions of 280×281 m, which when converted to *dhanus* become nearly 147×147 D, or 49×49 with the units of three times *dhanus*, which would be a natural plan for a *vāstupuruṣamaṇḍala*. The base of the temple was generally in a square grid of 8 or 9 units (64 or 81 squares) in the *Bṛhat Saṃhitā* (Bhat 1995), but according to other texts it could range from one to 1024 square divisions (Kramrisch 1946:58). The *Vaikhānasāgama* gives special importance to the 7×7 plan.

The Bṛhadīśvara temple (which was completed in 1010), has a sanctum tower of $30.2 \times 30.2 \times 66$ and it is within an enclosure of 240×120 m. In *dhanus* units, this amounts to 16×16 D plan in an enclosure of 126×63 D, where the error is less than one percent in the sanctum and almost zero for the enclosure. This indicates that the sanctum used a *vāstupuruṣamaṇḍala* of 64 squares where each square had a side of one-fourth *dhanus*.

Considering the *dhanus* unit outside of India, let us look at the Angkor Wat complex, where we use the dimensions given by Mannikka (1996).

Outer perimeter: 1024×802 m = 540×420 *dhanus* (error less than 0.4 percent); sum of the sides is 960 *dhanus*.

Outer gallery: 187×215 m = 97×113 *dhanus* (error less than 1 percent); sum of the sides is 210 which is one half the width of the outer parameter.

Middle gallery: 100×115 m = 53×60 *dhanus*; sum of the sides is 113, which is the length of the outer gallery; it is also one-third the atmosphere + sky number of the Vedic altars (Kak 1993, 2000a, 2000b).

Inner gallery: 60×60 m = 32×32 *dhanus*; the inner gallery is a 64×64 *vāstupuruṣamaṇḍala* in half-*dhanus* units.

The number 113 is attested as an important number of Vedic rituals and the representation of the inner gallery as a 64×64 *vāstupuruṣamaṇḍala* in half-*dhanus* units validates the use of the measure.

b. The Prambanan dimensions in *dhanus*

We now consider the Prambanan dimensions. In terms of *dhanus* units, the outer two perimeter sides are 116×116 D, and 58×58 D, respectively, with less than one per cent error. The Śiva temple becomes 18×18 D, with less than half-percent error. The dimensions of the Śiva temple mean a *vāstupuruṣamaṇḍala* of $9 \times 9 = 81$ squares where each side of the square is 2 *dhanus* long. This choice had a bearing on the ultimate dimensions of the temple. As we have seen in the later Angkor

Wat dimensions as well, the squares of the *vāstupuruṣamaṇḍala* are either multiples of the dhanus unit or its simple divisors.

The side of the Viṣṇu and Brahmā temples becomes 81 *pāda*, which admits a *vāstupuruṣamaṇḍala* of 9×9 *pāda*. Likewise, the perwara temples have sides nearly 25 *pāda* long, implying a *vāstupuruṣamaṇḍala* of 5×5.

The sum of the heights of the Viṣṇu or Brahmā temples (33 m) and the perwara temple (14 m) equals that of the Śiva temple (47 m). These heights are almost exactly equal to 78, 33, and 111 *aratni*, but we are not sure if these numbers had a special symbolism.

The Tantric context

The evolution of the temples of the larger Hindu world was shaped by Tantric ideas that were shared by Hindus and Buddhists. The Tantras are a map of the inner cosmos for the discerning and ritual for the layperson, in which theological differences related to names do not matter (Goudriaan and Gupta 1981). This explains how the eleventh-century Buddhist abbot Vidyākara in his anthology of Sanskrit poetry has 29 verses on the Buddha (together with the Bodhisattvas Lokeśvara and Mañjughoṣa), when he has many more on Hindu divinities, that is 74 verses on Śiva and his household (Pārvati, Kumāra, Gaṇeśa, Nandi), 44 on Viṣṇu (including Lakṣmī, Rāma, Krṣṇa, Rādhā), and an additional 4 on Sūrya (Ingalls 1965). The same attitude was behind the building of both Hindu and Buddhist temples by kings, as in the example of Lalitāditya of Kashmir (Huntington 1985:360).

The idea of Tantra, inherent in the Upaniṣadic homology of the *Ātman* and *Brahman*, is the equivalence of the body and the universe (*piṇḍa* and *brahmāṇḍa*), which suggests recursion or repetition of patterns across space, scale and time. The *Atharvaveda* speaks of the city of gods, Ayodhyā, which is the body itself, and the *Chāndogya Upaniṣad* echoes this in describing the body to be the city of Brahman. A *yantra*, a representation of the inner cosmos, is described in the *Śvetāśvatara Upaniṣad*. Early Vedic ritual had some balance between the outer and inner elements but as the Hindu temple evolved, the representation of the inner cosmos became the predominant element, and the temple plan came to be based on maṇḍalas (Kak 2002, 2006).

It is significant that *yantric* buildings in the form of maṇḍalas have been discovered in northern Afghanistan that belong to a period that corresponds to the late stage of the Harappan tradition around 2000 BCE (Kak 2000a, 2005b). Apart from orientation in the cardinal directions for temples or other monumental buildings, additional astronomical alignments were used. For example, in cave 6 of the Udayagiri complex on the summer solstice of the year 402 CE, the shadow of the Iron Pillar of Delhi (which was originally located at the entrance of the passageway) fell in the direction of the reclining Viṣṇu panel (Balasubramaniam 2008).

Tantric ideas were at the basis of much temple building activity in India in late first millennium by both Hindus and Buddhists. As mentioned before, the very basis of the temple plan is the *vāstupuruṣamaṇḍala* in which deities are mapped to different squares of the temple. But now in a further evolution of this idea a three-dimensional maṇḍala was used in the Somapura Mahāvihāra in

Paharpur, and the Śrī Yantra was installed in many Śakti temples such as the Kāmākṣī Amman Temple in Kanchipuram.

Vedic cosmology and temple construction

Here I wish to show that Vedic texts are helpful in knowing the grammar that lies behind the constructions of the *śilpin* who consulted not only the *śilpaśāstras* but also texts like the *Śatapatha Brāhmaṇa* (ŚB) on how to synthesize the basic elements of the temple into new forms. The foundation of Vedic cosmology is the notions of *bandhu*, homologues or binding between the outer and the inner, each of which is viewed as having a tripartite structure. For example, in the Āyurveda medical system, the 360 days of the year are taken to be mapped to the 360 bones of the developing fetus, which later fuse into the 206 bones of the person.

The sacred ground for Vedic ritual is the precursor to the temple. The Vedic observances were connected with the circuits of the sun and the moon (Kak 1993, 2000a). The altar ritual was associated with the east-west axis and it maintained different day counts with respect to the solstices and the equinoxes. Specific days were marked with ritual observances that were done at different times of the day.

It was estimated correctly that the sun and the moon are approximately 108 times their respective diameters from the earth (perhaps from the discovery that the angular size of a pole removed 108 times its height is the same as that of the sun and the moon), and this number was used in sacred architecture. The distance to the sanctum sanctorum of the temple from the gate and the perimeter of the temple were taken to be 54 and 180 units, which are one-half each of 108 and 360 (Kak 2005a). This represents a ratio of 10 to 3 between the perimeter and the axis.

In the ritual at home, the householder employed three altars that are circular (earth), half-moon (atmosphere), and square (sky), which are like the head, the heart, and the body of the Cosmic Man (*Puruṣa*). In the Agnicayana, the great ritual of the Vedic times that forms a major portion of the narrative of the *Yajurveda*, the atmosphere and the sky altars are built afresh in a great ceremony to the east. This ritual is described at great length in the Brāhmaṇas. This ritual is based upon the Vedic division of the universe into three parts of earth, atmosphere, and sky that are assigned numbers 21, 78, and 261, respectively.

The numerical mapping is maintained by placement of 21 pebbles around the earth altar, sets of 13 pebbles around each of 6 intermediate ($13 \times 6 = 78$) altars, and 261 pebbles around the great new sky altar called the Uttara-vedi, which is built in the shape of a falcon; these numbers add up to 360, which is symbolic representation of the year. The proportions related to these three numbers, and others related to the motions of the planets, and angles related to the sightings of specific stars are reflected in the plans of the temples of the historical period (Kak 2009; Kaulācāra 1966).

The Agnicayana altar is the prototype of the temple. The altar is first built of 1,000 bricks in five layers (that symbolically represent the five divisions of the year, the five physical elements, as well as five senses) to specific designs. To represent two more layers of reality beyond the purely objective,

a sixth layer of bricks that includes the hollow *svayamātrṇṇā* brick with an image of the golden *Puruṣa* inside is made, some gold chips scattered and the fire placed, which constitutes the seventh layer (ŚB 10.1.3.7). The five layers are taken to be equivalent to the Soma, the Rājasūya, the Vājapeya, the Aśvamedha, and the Agnisava rites. The two layers beyond denote completion, since seven is a measure of the whole. The meaning of this is that the ceremonies of the great altar subsume all ritual.

According to ŚB 7.4.1, within the hollow brick in the navel of the Uttara-vedi, a lotus-leaf is placed upon which is then placed a gold *rukma* (a disk, with 21 hangings), which symbolizes the sun. The golden *Puruṣa* (representing Prajāpati as well as the Yajamāna himself) is laid on the back with the head towards the east on top the *rukma*.

On the sides of the golden *Puruṣa* are two offering spoons, like two arms. Upon this image is placed the already mentioned *svayamātrṇṇā* (self-perforated) brick. In total, there are three such bricks, in the centre of the first, the third, and the fifth layers. There are seven more bricks placed to the east of the *svayamātrṇṇā* brick in the fifth layer. Next is a wooden mortar placed and on top of the mortar is placed the *ukhā*, the fire-pan which becomes the focus of the fire ceremony. The “sixth layer is the heavenly world, and the seventh layer is immortality” (ŚB 8.7.4.17-18).

The stūpa is easily seen as derived directly from the piled altar, with the relics of the Buddha replacing the golden *Puruṣa* within the hollow brick. The *garbhagr̥ha* of the Hindu temple likewise is an enlargement of the hollow space of the *svayamātrṇṇā* (self-perforated) brick.

The worship of Śiva, Viṣṇu, and Śakti may be seen to have emerged from Agnicayana. The temple is not merely the buildings, the deity, but also the complex of the *yajña*, *pūjā*, or ceremonies performed there, so that in totality it represents both the being as well as the becoming. The becoming, or the transformation, requires the use of a special vocabulary related to inner processes. Briefly, Rudra is one of the names of Agni. According to Vājasaneyi S. 16.2, Agni has two forms, the auspicious Śiva and the fierce Rudra. During the building of the altar, Agni appears in its *raudra* manner, and to propitiate it the Śatarudrīya homa is performed. This propitiation of Agni-Rudra is also done literally by a stream of water that drops out of an earthen pot hung over the *liṅga*. In one of the constructions of Nāciketa Agni, 21 golden bricks are placed one top of another to form the *liṅga* (*Taittirīya Brāhmaṇa* 3.1.1.6).

In the Vaiṣṇava tradition, the visualized golden *Puruṣa* is Viṣṇu-Nārāyaṇa who emerges from the navel of the lotus on the Uttara-vedi that represents the waters, and for this reason is also called Padmanābha. The golden disk upon the lotus is then the *sudarśana cakra* of Viṣṇu.

These ideas became the foundation for temple construction in later texts. According to *Tantrasamuccaya* I, ch 1 74-89 and *Śilparatna* 63, a treasure jar (*nidhikalaśa*) made of stone or copper is placed on the foundation stone (*ādhāraśilā*), on which a stone lotus is placed, upon which are successively placed stone tortoise, silver lotus, silver tortoise, gold lotus, and gold tortoise, which represents Viṣṇu upon whom the world rests. From there a funnel shaped tube, the Yoganāla, made of copper leads up to the plinth or to the lowermost molding (Kramrisch 1946:110).

The *garbhādhāna* ceremony, done in the Vedic times to steady the womb, is performed to the earth. The *garbha* vessel is made of copper, but it may be made of silver or gold also. The vessel is lowered into the ground on an auspicious night. On its floor the serpent Ananta is drawn and it is placed on the hood of Ananta. On the lid of the casket, the maṇḍala of the earth is drawn (Kramrisch 1946:126).

It is not surprising that in the pits dug below the Śiva and Viṣṇu temples at Prambanan, gold plates and gold foil figures of a turtle, wheel, and serpent were found. Although some of the gold foil figures, such as the turtle, the spoked wheel, and the serpent are associated with the churning of the milky ocean, they cannot be taken as proof that this temple was a representation of the churning of the milky ocean.

The perwara temples

Several theories have been advanced for the choice of the count 224 for the perwara temples. According to Lokesh Chandra (1967) these temples represent the worlds of the cosmological system of the Śaiva Siddhānta, but the specific reference to this system was not indicated (Jordaan 1996:47).

I would like to propose that this count is related to Tantric ideas that were popular in the 9th century. The Śaivite philosopher Śaṅkara (788-820) speaks of the Goddess of the Śrī Yantra in the *Saundaryalaharī* (SL). In SL11, the description of the Śrī Yantra in terms of its 4 *Śrikanṭha* (upward pointing) and 5 *Śivayuvātī* (downward pointing) triangles, creating a total of 43 triangles is provided.

The Śrī Yantra is the tripartite division of earth, atmosphere, and the sun, which is mirrored in the individual by the body, the breath, and the inner lamp of consciousness; it also represents the three parts of the body: neck to head, neck to navel, and navel to the bottom of the trunk. Its basic form is that of three triangles. Second, within each triangle are lower hierarchical levels of two other triangles, of alternating opposing polarity that represents male and female principles. All together, this adds up to 9 interpenetrating triangles (5 downward pointing Śakti principle and 4 upward pointing Śiva principle), which through their overlaps constitute a total of 43 small triangles. Right through the middle of this is the dot, the *bindu* that is the transcending union of the Goddess and Śiva, the Witness, or Consciousness.

The 42 outer triangles, each of which is associated with a deity, are arranged in four circles around the middle triangle, with counts of 8, 10, 10, and 14 in the four arrays. According to SL 14:

Fifty-six for earth (*mūlādhāra*); for water fifty-two (*maṇi-pūraka*),
 Sixty-two for fire (*svādhiṣṭhāna*); for air fifty-four (*anāhata*),
 Seventy-two for ether (*viśuddhi*); for mind sixty-four (*ājñā cakra*)
 Are the rays; even beyond these are your twin feet.

These rays are the emanations from the body (of the Śrī Yantra as well as that of the worshiper), and the verse claims that the transcendent Goddess remains beyond the domain of these rays. The six

cakras are classified in *granthis* (knots) of two. The lowest two *cakras* correspond to 108 rays, the middle two to 116, and highest two to 136 rays. I suggest that the emanations of the lower two *granthis*, which add up to 224, are represented by the *perwara* temples, as they are built out of earth, water, fire, and air. The additional rays of the highest *granthi* are mapped into worship and ceremony that corresponds to ether and mind.

Śaṅkara's influence on Indian thought and religion during his life was meteoric and it is likely to have resonated in Indonesia as well. Since Prambanan was completed only in the mid-ninth century, it is reasonable to assume that the centrality of the Śrī Yantra in Śaṅkara's lived religion, as contrasted to philosophy and debate, influenced adepts and temple architects in Java. The four terraced round shrines of the *candi perwara* mirror the four circles of deities around the central triangle which is the place of the union of Śiva and Śakti and the similar count of 224 indicates that the Śrī Yantra was a model for the Prambanan temple.

The *Devī Mahātmya*, which is a part of the *Mārkaṇḍeya Purāṇa* (c. 400), is the textual source for the worship of Śrī Yantra. It is significant that Ṛṣi Mārkaṇḍeya is believed to have brought Hinduism

to Java and Bali. This no doubt represents the fact that the main form of Hinduism in Indonesia was Śaktism, in which one of the iconic images is that of Durgā as the vanquisher of Mahiśāsura, who is celebrated on the day after Navarātri ("festival of nine nights"). Durgā in this form is Caṇḍī, and it is appropriate that the temple in Indonesia came to have this name.

I would also like to propose that numbers related to the Ṛgveda explain the additional 10 temples within the complex. The number 43, central to the Śrī Yantra, is the count of hymns in the second *maṇḍala* of the Ṛgveda. The first two *maṇḍalas*, which are the base of the 5-layered altar of *mantras* (Kak 2000a), have a total of $191+43=234$ hymns,



Fig. 2: Śrī Yantra, which represents the cosmos recursively

which is equal to the count of the 224 temples in the outer yard together with the two *candi apit* and the 8 turret-like *candi kelir* temples inside the surrounding wall of the inner yard.

Conclusion

This essay has found an answer to the puzzle of the dimensions of the Prambanan complex in its use of integer multiples of the dhanus measure. We have suggested that the 224 *candi perwara* are the emanations associated with the Goddess in the Śrī Yantra system. The four terraced sets of *candi perwara* shrines are like the four concentric sets of triangles in the Śrī Yantra.

The proposed ideas in this essay make the Goddess central to the complex, which is consistent with the traditional view of the Javanese in which it is famous as Candi Loro Jonggrang and not Candi Śīva. It may be assumed that the King-commissioner constructed the temple with multiple dedications to Rāma as the ideal ruler, Śīva as the Great God, and Durgā as the goddess who guides one to inner and outer victory.

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