

Chapter 13

An Archaeoastronomical Investigation of *Vaastu Shastra* Principles (Vedic Architecture) Implemented in the City Planning of Ancient Chiang Mai



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13.1 Introduction

In many ancient kingdoms of Thailand, architectural forms including city and temple planning were influenced by Indian culture transmitted throughout the era of the Dvaravati and the Khmer Empire. The structural principles of Indian architecture propagated to Southeast Asia through migration, trade, and the missionary activities of Buddhism (*Theravada* and *Mahayana*), as well as Hinduism (*Shaivism* and *Vaishnavism*). Clear evidence of Indian influence in Thailand can be seen at the Sri Thep Ancient City (currently located in Phetchabun province), which was an ancient city during the Dvaravati era (sixth–eleventh centuries) when Buddhism and Hinduism flourished (O’Reilly, 2007).

During the thirteenth century, the most powerful king of the Khmer empire was King Jayavarman VII (CE 1181–1219) who regained the Khmer’s independence from the Cham and founded Angkor Thom to be a new capital. The design of city and temple in Khmer architecture followed the knowledge of Vedic architecture named *Vaastu Shastra* as a blueprint, incorporating the belief in deities, planets of the eight directions, and buildings oriented to astronomy (Chandler, 1993). King Jayavarman VII also adopted Mahayana Buddhism instead of Hinduism, which was reflected in the infamous Bayon temple. Furthermore, he built several religious buildings resembling the Bayon art, a new art which was well-received throughout the Thai regimes in the northeast and southeast, and in central Thailand provinces

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such as Phetchaburi, Kanchanaburi, and Sukhothai. The influence of Indian architecture from central Thailand had propagated to the northern part of Thailand and reached the Lanna Kingdom when Queen Jamadevi brought nearly ten thousand followers, including monks, philosophers, and artisans from the Lavo Kingdom (Lopburi province) to found the city of Hariphunchai (now in Lamphun province). The Queen turned Hariphunchai into a resourceful city for arts and culture. Later, she founded Khelang Nakorn (Lampang province) to be another main city. The ancient Mon language was also scripted on a stone inscription during the Hariphunchai period. Thus, Queen Jamadevi can be regarded as a propagator of Indian culture from the Dvaravadi and Khmer regimes to land in the northern part of Thailand. Later, in CE 1281 the Hariphunchai Kingdom became part of the Lanna Kingdom (Ongsakul, 2005). Ancient kingdoms in the land of present-day Thailand that were ruled by the Khmer adopted Khmer city planning, with the city laid out in square or rectangular shapes, similar to the plan of Angkor Thom. Angkor Thom featured a square plan, surrounded by walls and moats, with the Prasat Bayon (temple) at the center.

During King Ramkhamhaeng's reign, Sukhothai also had the same Khmer ancient city planning features: a rectangular plan bounded by walls and moats. In the center of the city was a religious building that symbolized the center of the Universe. This differed from the previous Dvaravati Culture where the plan had an irregular shape similar to a conch (*Shanka*) or a sphere, as seen in U-thong, Lavo, Hariphunchai and Khelang Nakorn. Other examples of Khmer city plans found in Thailand are Mueng Sing and Mueng Phimai. Mueng Sing's plan is almost a square shape with Prasat Mueng Sing located at its center. Mueng Phimai has a rectangular plan enclosed by walls and moats. There was a gate on each of the four sides, and the Moon River flowed through the city from north to east. In the center was Prasat Hin Phimai (Chaturawong, 2017).

According to the *Chiang Mai Chronicle* (Wichienkaeo and Wyatt, 1995), initially King Mangrai had planned to build a city in a square shape with the sides 2000 *wa* (~ 3.2 kilometers) long, which would have been the same size as Angkor Thom. However, he was cautioned by King Ram Khamhaeng regarding homeland security, and so decided to reduce the size. Although Lanna people were migrants from southern China, there was no city planning that used Chinese *Feng Shui* principles. In general, *Feng Shui* and *Vaastu Shastra* were similar, except that the orientation of the main entrance was different (Saran and Shirodkar, 2017).

The reason for choosing *Vaastu Shastra* rather than *Feng Shui* principles could have been because India and the Lanna Kingdom were at the same latitude, and therefore the Lanna Kingdom was geographically more similar to India than to China. Also, the seasons, the monsoon directions, and religious beliefs were more similar. Furthermore, the influence of the powerful Khmer Empire propagated through Sukhothai or through Lavo to Hariphunchai could have been additional reasons for adopting *Vaastu Shastra* in Chiang Mai city planning. In this chapter, we will report on how closely Chiang Mai city planning corresponds to the *Vaastu* principle.

13.2 City Planning of Ancient Chiang Mai

Chiang Mai (the current name), the capital city of the Lanna Kingdom, was founded by King Mangrai the Great, the first Lanna king, in CE 1296. Chiang Mai was given the name *Nop Buri Sri Nakorn Ping*, and was situated in the upper northern part of Thailand between the base of Suthep Mountain and the basin on the right of the Ping River. The Lanna people inherited a fertile land capable of producing high-yield agricultural crops. They also had their own language, scripts, customs, traditions and culture. The history of the Lanna Kingdom can be divided into three periods. The first period was when Lanna was an independent state (the Mangrai Dynasty in CE 1296–1558). The second period was when Lanna was under Burmese rule, from 1558 to 1774, and the third period was when Lanna became a state of Siam (a Siamese tributary during the Chet Ton Dynasty from 1782 to 1939). In 1932, Khana Ratsadon (meaning ‘People’s Party’) changed the system of Government in Thailand. The City Governor’s position was revoked, and Chiang Mai became a province under the central administration.

Information about Chiang Mai city planning in this research was gathered from the remaining primary sources such as *Pubsa* (mulberry paper), *Bailan* (palm-leaves) and stone inscriptions. These sources were documented after the founding of the city, as described in detail in Sub-section 13.2.1. This research study is based on information that was compiled from all primary sources and published as *The Chiang Mai Chronicle* (CMC) by Wichienkaeo and Wyatt (1995) and *History of Lan Na* by Ongsakul (2005). These books provide valuable details about the city’s founding, as described in Sub-sections 13.2.2 and 13.2.3. CMC is based on the Chiang Mai chronicle that translated Lanna Tham scripts from authentic palm-leaves and were corrected by Dr Hans Penth (1937–2009), and are known as ‘Hans Penth version’. The original palm-leaves script had been organized into eight bundles of leaves (the maximum one with 26 sheets), each with multiple sheets that were written on both sides of the leaf. To refer to Dr Penth’s collection, we write CMC-*a.bc*, where *a* indicates the bundle number (1-8), *b* is the sheet number (01-26), and *c* is the V (front) or the R (back) of the sheet. For example, the code CMC-2.13V refers to the 2nd bundle, the 13th sheet, and the front of the sheet.

13.2.1 Overview of the Historical Records

The study and writing of Lanna history started about six hundred years ago when local scholars and monks began composing chronicles on palm-leaf manuscripts. Today, the chronicles still retain a strong foothold in local popular consciousness, and they are a rich source of information for modern historians.

The Wat Phra Yean stele, inscribed in CE 1370, is considered the region’s oldest stone inscription. Another stele of dynastic succession, the stone inscription in Fak

Kham script, was inscribed in 1411 and the Wat Chiang Man stele, was inscribed in 1581.

The earliest chronicles, written in the fifteenth and sixteenth centuries are now generally considered classical chronicles. Important texts from this period, including the *Mulasasana*, *Camadevivamsa* and *Jinakalamali* chronicles, became the model for all others over the following centuries.

The pioneer of the modern study of history in Thailand was Phraya Prachakitkorachak (Chaem Bunnag), who produced a renowned study of Lanna, the *Yonok Chronicle* (Ongsakul, 2005).

13.2.2 *The Founding of Chiang Mai*

According to the Lanna inscriptions and historical evidence, they are all in agreement that King Mangrai obeyed the auspicious time to move into the site on Thursday of the 7th Lanna lunar month (equivalent to the 5th Thai lunar month), waxing moon the 8th day, 654 *Culasakaraj* (CS) (CMC-2.10R). This was regarded as the building date of his temporary royal residence. He used his residence, which was on the northeast of the Chiang Mai City plan (today it is Wat Chiang Man), to work on the planning of the city.

According to CMC-2.10R, King Mangrai gave an order to begin plowing the site from his sleeping chamber to the northeastern corner, or the Sri Bhumi corner. Beyond the Sri Bhumi corner, there was a large lake named *Nhong Kiew* (or *Nhong Bua Jed Gor*) that connected to the Mae Kha canal. King Mangrai was very satisfied because there would be plenty of water for elephants, horses, and castles to shower and drink. He then asked carpenters to prepare wooden logs for building an elephant nursery, horse pens, observation towers, and city gates, hoping to build a grand city.

As King Mangrai and his two royal friends—King Ruang of Sukhothai (King Ram Khamhaeng) and King Ngam Muang of Phugamyao (present-day Phayao)—entered the site, they saw a large albino mouse along with its four followers ran from the temporary royal residence towards the east and then into a hole under a *Ficus lacore* tree (the same family as the Banyan tree, which was considered an auspicious tree). They were all very pleased to witness this event, and brought offerings to worship the mouse and the tree. They then designated the tree to be the city guardian, and it remained ever since (CMC-2.11V).

Afterwards, the city was planned to be 900 *wa* in width and 1000 *wa* in length (*i.e.* a rectangular shape) (CMC-2.11R). The laborers were divided into two groups. The first group, of 50,000 people, would build royal residences, royal halls, elephant nurseries and horse pens. The second group, of 40,000 people, would build the city walls by digging moats on all four sides and building up the soil to form the walls around the perimeter (CMC-2.13V).

Based on the CMC it took four years of city planning, then the groundbreaking day was the Full Moon, the 8th Lanna lunar month, 658 CS (CMC-2.13V). However, according to the Wat Chiang Man inscription (*Database of Inscriptions in Thailand*

| *Wat Chiang Man Stale*), it was the waxing moon the 8th day, the 8th *Lanna* lunar month, 658 CS. It took four months to complete the construction. Afterwards, the city hosted a festive celebration for three days and three nights with its name being given as *Nop Buri Sri Nakorn Ping*.

13.2.3 *Chiang Mai City Walls and Gates*

The CMC indicates that after the completion of all four city walls, five city gates were built (CMC-2.13V). However, there is no record of the name of the gate in each direction, therefore it cannot be certain whether the current names were the original names. Presently, the gate in the north is called Pratu Chang Puenk. The western gate is called Pratu Suan Dok. The eastern gate is Pratu Thapae (initially named Pratu Chiang Ruek). In the south, there are two gates: Pratu Chiang Mai (the back gate) and Pratu Suan Prung. Pratu Suan Prung, previously called *Suan Re*, was built in the reign of King Samfangkaen (the eighth King in Mangrai Dynasty, during CE 1402–1441), which implies that this gate is not one of the original gates.

Regarding a common practice when entering and exiting the city gate, Lanna kings in all reigns followed the local custom (Lawa or Lua), *i.e.*, of entering the city through the north and paying respect to the northeast. If there is a funeral, the deceased must be transported out through the south only. From the end of the Mangrai Dynasty Chiang Mai was under the Burmese rule for more than 200 years, but once Chiang Mai was recovered it was left deserted for several years.

By the time Phra Chao Kawila (the first King in the Ched Ton Dynasty during the Rattanakosin period) ruled Chiang Mai all of the city walls had deteriorated so he rebuilt them using bricks. He also built a fortress and inner-city gates. On top of the walls, bricks were laid and battlements (called *Sema*) were placed on the walls and on all four gates. The city walls as seen today were rebuilt in 1947 by the Chiang Mai Municipality in order to enhance the beauty of the city. The present walls are in the original location, but the city gates, which many people believe to be ancient, were all rebuilt.

13.3 *Vaastu Shastra* Principles

The *Vedas* are ancient sacred Hindu scriptures compiling into four resourceful collections about religious rituals and sacrifices. *Atharva Veda* (the fourth Veda) stands apart from the sacrificial theme of the other three Vedas (*Rig Veda*, *Yajur Veda*, and *Sama Veda*) in that it focuses on spells and incantations to protect human well-beings from demons or illness. It can be considered a primary source to study Vedic beliefs, philosophies and cultures. There are also several auxiliary disciplines (*Vedanga*) associated with the Vedas, and some even have applied knowledge. For example, a part of *Sthapatya Veda* called *Vaastu Shastra*, and subordinate to the

Atharva Veda, is the ancient science of designing and constructing buildings (Volwahesn, 2001).

13.3.1 Vaastu Shastra

Vaastu Shastra is a traditional Hindu system of architecture. Literally, the words mean “science of architecture”. It is one of the most ancient architectural belief systems, similar to other traditional architectural sciences such as *Feng Shui* of China.

The basis for architectural design of *Vaastu Shastra* is the belief that mankind and the Universe are analogous in their structure and spirit, and that the Earth is a living organism, pulsing with life and energy. *Vaastu Shastra* principles strive to achieve optimum benefits of the *Panchbhutas* (five elements of nature), the Earth’s magnetic field, and the rotational influence of the Sun, the Moon and the other surrounding planets. The goal is to attain a balanced setting for the *Vaastu-Purusha-Mandala*. Here *Vaastu* means environment, site or a building. *Purusha* is regarded as the ‘man’ of the Universe or the cosmic man or a creative intelligence in the Universe. *Mandala* is a geometric plan or chart representing the cosmos. In Hindu cosmology, the cosmos is usually represented by a square plan. Thus *Vaastu-Purusha-Mandala* is a metaphysical diagram of the planned site resembling the cosmos in which the *Purusha* resides. Because the Earth is essentially demarcated by sunrise and sunset, by east and west, by north and south, therefore orientation, particularly the cardinal directions, hold a significant contribution. In Fig. 13.1, the orientation principles of *Vaastu Shastra* are better understood by providing various associations to the eight cardinal directions (northeast, east, southeast, south, southwest, west, northwest and north) (Patra, 2014).

13.3.2 The Vaastu-Purusha-Mandala

Vishwakarma, the celestial architect who is regarded as the father of *Vaastu Shastra* and described the *Vaastu-Purusha-Mandala* once revealed in his treatise *Vishwakarma Prakash* a fascinating story about the origin of the *Vaastu-Purusha-Mandala*.

There was once a war between the Gods (*devtas*) and the Demons (*asuras*) that resulted in an accumulation of sweat that fell on the Earth. The accumulated sweat then transformed to a gigantic vicious being and continued to frighten both the *devtas* and the *asuras*. The *devtas*, led by Lord Shiva, and the *asuras*, led by *Andhaka*, together decided to ask Lord Brahma to tame this being. Lord Brahma laid the giant down on the earth with his head towards the northeast and feet towards the southwest. He then called this giant his mind-being and named him *Vaastu Purush*. Lord Brahma then announced that whoever reveres the *Vaastu Purush* and performs the



Fig. 13.1 The eight cardinal directions in *Vaastu Shastra*. Each direction is associated with a God or Deity of the nine planets: Sun, Moon, Mercury, Jupiter, Venus, Mars, Saturn, Rahu and Ketu. The Earth planet is said to have a presence of all five elements: earth, air, water, fire, and space. The deities associated with the directions are said to yield eternal blessings.

Vaastu Purush Pooja while constructing a temple, palace, house, pond, city *etc.* will be blessed by the *devtas*; doing the opposite will bring destruction by the *asuras*.

To ensure peace, health and prosperity, it is advisable to keep the eternal rules of the *Vaastu-Purusha-Mandala* in mind while designing any structure.

The whole *Vaastu-Purusha-Mandala* plot takes a square shape exhibiting a perfect and absolute form. The *Vaastu Purush* is the presiding lord of the whole plot. The plot can be fragmented into a square grid. There are 32 ways (Chakrabarti, 2013) of constructing *Vaastu-Purusha-Mandala* in *Vaastu Shastra*. The simplest one is conceived with a square and the largest in these characteristics is of 1024 *padas* (squares). Fig. 13.2 illustrates *mandalas* with the corresponding names of sites, starting with a 1 × 1 square site to a 9 × 9 (81) square site. The innermost square is called *Brahma* and is always occupied either by a temple or a palace. Different classes of human beings occupied different zones.

The exact size and shape of *Vaastu-Purusha-Mandala* is determined by the requirements of the building construction.

The story of *Vaastu Purush* is depicted diagrammatically in the *Vaastu-Purusha-Mandala* with specific portions allocated hierarchically to each deity based on their

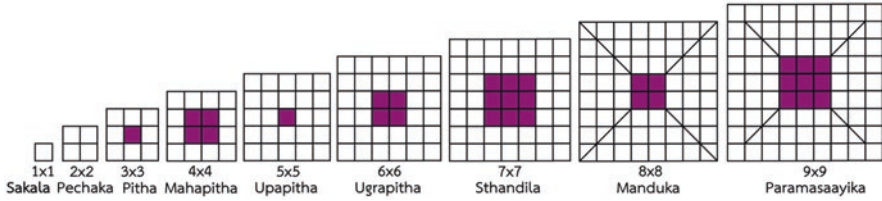


Fig. 13.2 *Vaastu-Purusha-Mandala* of various sizes from 1×1 to 9×9 square site, *Brahma* zone for each *mandala* is colored at the center.

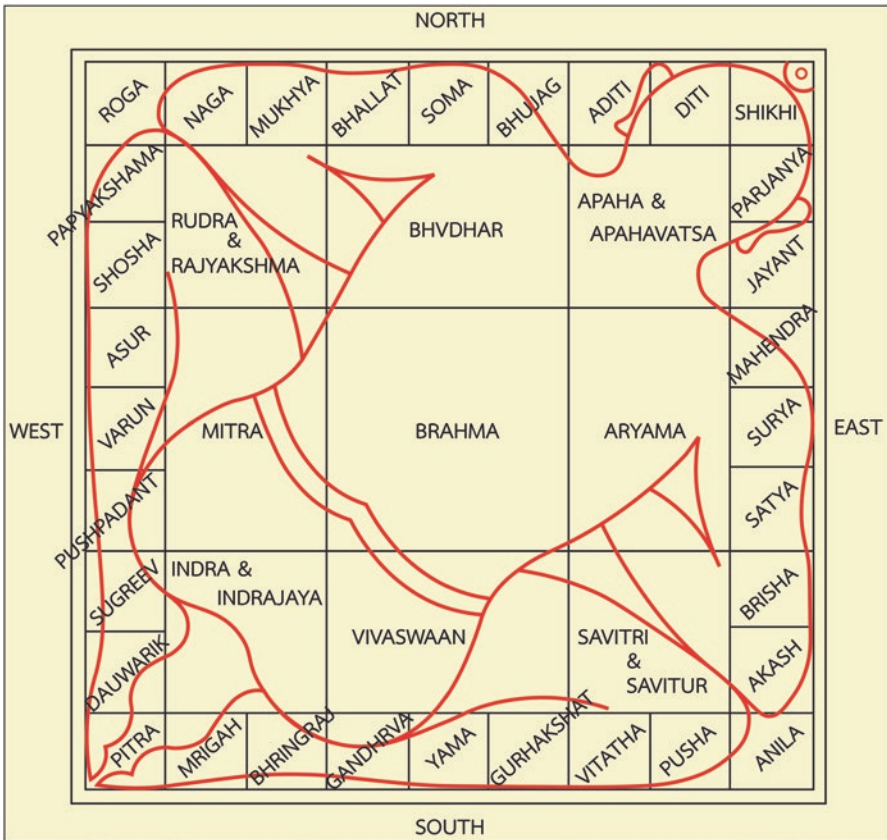


Fig. 13.3 A square plan that illustrates how the *Vaastu Purush* was pinned down by *Brahma* and 44 Gods.

attributes and powers. The division of the built-up space represents different energy fields. We call this process the *Pada Vinyasa* (modular grid). For example, for the nine-divided site in Fig. 13.3, there are a total of 45 energy fields that constitute the *Vaastu-Purusha-Mandala*. They are as follows:

- (1) The Central Energy Field: *Brahma*, the Creator – *Brahma Vithi*, it is the most sacred part of the building. It contains within it, all the possibilities of creation

and existence. First the *Shilanyas* (foundation stone laying ceremony) is done and the construction of the foundation walls begins by digging the earth.

- (2) The four Energy Fields next to *Brahma* – The *Deva Vithi* as *Bhudhar* (the power of manifestation), *Aryama* (the power of connection), *Vivaswaan* (the power of revolution or change), and *Mitra* (the power of inspiration and action).
- (3) The eight Energy Fields in the diagonal directions, the *Manushya Vithi*.

13.3.3 *Vaastu Shastra Principles for Town Planning*

Vaastu Shastra laid strong emphasis on the selection of a proper site for establishing a new village, town or a city. A well-planned town has happy inhabitants and a healthy atmosphere, and *Vaastu Shastra* plays an important role in developing a planned town.

In planning a town, a habitation, villages, a fort, a city or any other groups of residences, the location at the starting point and the surrounding climate and soil should all be taken into consideration. The first essential of town planning is to examine the soil. An ideal town must have a green belt of forests where tall trees, plants and flowers are found in abundance. This is necessary not only from the point of view of healthy climate, but it is also conducive to the growth and maintenance of the population requiring fruits, fuel and fodder. Moreover, the natural scenery of this vegetation will add beauty and grandeur to the town.

For a town, the site should be selected on the bank of a river, seashore or lake. Trees, fruits and flowers should surround the site. The eastern side of the town should be lower, so that the Sun shines on the front doors of buildings. The site should not be selected on the western side of a mountain (Shukla, 1961: 261–267).

According to Dutt (1925: 101–102), *Vaastu Shastra* recommends five different shapes of towns: (1) square (*chanturasra*); (2) (rectangular or oblong (*ayatasra*); (3) approximately circular (*vrta*); (4) elliptical (*vrtaayata*) and (5) perfectly circular (*golavrta*).

After the survey of the region and the selection of the site, the first thing for a town-planner is to plan out the roads and streets, lanes and by-lanes, together with the orientation of the place so as to make it a fit place for human habitation with ease and comfort, health and longevity, peace and prosperity. The layout of the roads and streets helps create inter-connection of the site, both internally and externally. The cosmic cross is used for pinpointing the roads running along the East axis to the West and the North to the South representing principal streets. Roads running along the East axis will ensure purification by the rays of the Sun from morning to evening. The North-South road will provide a perfect circulation of the air and have the benefit of a cool breeze. Furthermore, the layout of water access is an indispensable pre-requisite in town planning because water is a fundamental necessity for life. No life can subsist without a good supply of natural water.

After the selection of land as per *Vaastu*, the site is plowed on an auspicious day as fixed by astronomical observation. The pair of specific oxen used for the plowing must have white spots on their heads and knees.

The next step is to determine cardinal directions using a gnomon, which concludes with the fixing of the *Vaastu-Purusha-Mandala*. Different kinds of them were used depending upon the need.

13.3.4 *Vaastu Shastra and Ancient Town Planning*

Vaastu principles (Vedic methods) have been applied in the design and development of villages, towns and cities. Mohenjo-Daro and other outstanding Harappan cities belonging to the Indus Valley Civilization, demonstrated some of these planning concepts. The Harappan cities had a grid plan just as is recommended in the Vedic manuals. The square shape represents the heavens, with the four directions representing the cardinal directions as well as the two solstices and the equinoxes of the Sun's orbit. A late example of a city designed according to the Vedic precepts is Jaipur. Vidyadhara, who designed the plan of the city, used the *Pithapada mandala* (3×3) as the basis. In these nine squares that represent the Universe, the central square is assigned to the Royal Palace.

To enhance the perceived spiritual experience, Southeast Asian temples were designed first as *mandalas*—deeply spiritual symbols blending cosmological, religious and psychological motives, which together represent the microcosmic and macrocosmic levels of the Universe (Kak, 1999).

The great Hindu temple complex of Angkor Wat in Cambodia was built by King Suryavarman II who reigned between CE 1113 and 1150. The cosmological and astronomical aspects of Angkor Wat originated in the ancient Indian Vedic traditions of altar and temple design. It was found that the temple served as a practical observatory where the rising Sun was aligned on the equinox and solstice days with the western entrance of the temple. Mannika (1996) has suggested that the *Vaastu-Purusha-Mandala* at Angkor Wat forms a grid of 49, rather than the standard of 64 or 81.

In Thailand, it is evident that Vedic architectural principles were applied to Prasat Hin Phanom Rung, currently located in Buriram province, and Prasat Hin Pimai in Nakorn Ratchasima. The format of temple planning, including the statues of Devas in each direction, are clear evidence of the implementation of *Vaastu Shastra*. As for the Chiang Mai city plan, several historians and architects have agreed that it is Khmer architecture based on *Vaastu-Purusha-Mandala* (Leawrungruang, 2014; Sodabanlu, 2006) and followed an auspicious orientation, with the city regarded as a human being. However, there is no detailed comparison between the Chiang Mai city plan and *Vaastu* principles. Furthermore, there exists a trace using *Vaastu* principles in military strategy, on stone inscriptions, including Lanna talismans. The talismans (*Yantra*) might represent the *mandala* containing information about time,

constellation and numbers calculated from *Suriyatra* and *Manatra* scriptures (Maison, 2019).

13.4 Comparative Study of Chiang Mai City Planning and *Vaastu* Principles

To this day, no traces of evidence or written records have been found on inscribed palm-leaves of the Lanna plans that can identify the knowledge or the textbook used in the city planning. This research study has gathered evidence from remaining ancient buildings and objects, including inscribed palm-leaves that were collected into chronicles, for example, *The Chiang Mai Chronicle* and *History of Lan Na*, containing information about the founding of the city, including customs and traditions that were passed down through generations since ancient times. We then conducted a comparative study of original scripts, or the ‘root wisdom’ of city planning that was extensively used between the seventh and the thirteenth centuries CE.

We find that the Chiang Mai site was chosen because it satisfied the seven good reasons (omens) described in detail in Sub-section 13.4.1. In Sub-section 13.4.2, we measure the shape of Chiang Mai city and then overlay onto it the *Vaastu-purusha-mandala* divided-sites of 8×8 , 9×9 , and 10×10 in order to determine which design matches the city plan. In Sub-section 13.4.3 we also investigate ancient Lanna norms, customs, and traditions passed down from generation to generation. Some of these practices are still applied to this day.

13.4.1 *Chiang Mai Site Selection*

In searching for a new site for founding a city, King Mangrai had scouted several places. He would stay at each location for three nights. Although it was suggested by CMC-2.09V that his mission was led by his visions in a dream, we rather believe that King Mangrai was in fact looking for a location that satisfied *Vaastu* principles. When he arrived at the site of present-day Chiang Mai, he did not rush to a conclusion. Instead, he spent time inspecting the topography, the climate of each season, and the local animal and plant species before he reached a decision.

According to CMC-2.12V and CMC-2.12R, King Mangrai invited King Ram Khamhaeng of Sukhothai and King Ngam Muang of Phayao to the new site and consulted with them on the suitability of the location and the city plan. Together they observed seven auspicious factors for the site, and it was only then that King Mangrai decided to establish the Lanna capital city (Chiang Mai) at this site. The seven auspicious factors (AF) were:

- (1) Two white deer, a doe and her fawn, came out of the big forest in the north to live at this auspicious location, and the people worshipped them.

- (2) Two white barking deer, a doe and her fawn, came to live at this auspicious location. The dogs did not bite them and fled.
- (3) People saw a white rat with four attendants that came to this auspicious location.
- (4) The western topography was high and sloped down towards the east.
- (5) Suthep Mountain was a source of water: the Mae Kha stream flowed down from Suthep Mountain, circled the town, and then flowed towards the south (Wiang Kum Kam).
- (6) There was a large water reservoir in the northeast where the animals could drink.
- (7) The Ping River flowed to the east of the site for the new city.

The comparative study in Table 13.1 shows the auspicious factors that correspond to *Vaastu* principles of site selection. The reasons for choosing the Chiang Mai site consisted of considerations from geographical aspects, *e.g.*, slope, mountain, a natural water resource, fertility of the soil, all of which helped promote harmonious living for plant and animal varieties. The position and direction of the large reservoir in the northeast was also taken into consideration, including the slope topography from west to east. All seven auspicious factors satisfied the *Vaastu* principles.

For King Mangrai, and to a great extent for the two invited kings, it was vitally important that this permanent capital of the Lanna Kingdom would effectively function as a powerful defense stronghold in the north, as well as a commanding political base which would exercise a strong influence and control over other Tai states in the area. Agriculture and trade for the prosperity of the population were also a serious consideration.

In terms of agriculture and trading connections, the selected site, which had open green fields, was suitable for agriculture, and especially wet rice cultivation. The wide, long Ping River offered an excellent mode of communication for trade and for the control of other states. Indeed, the site was already connected to the ancient caravan routes through the mountains used by traders from India, Burma and Yunnan who traveled with tea horses and cattle caravans.

13.4.2 *The Shape of Chiang Mai City*

According to CMC-2.11R, King Mangrai ordered the construction of a perimeter wall and moat, which were laid in a rectangular shape of 900 *wa* by 1,000 *wa*. However, the actual size that we measured is in a square shape, contrary to what is recorded in the Chronicle. We assume that the reason King Mangrai did not disclose the actual size might have related to homeland security.

According to *Vaastu Shastra*, the foundation stone-laying ceremonies were done at the center of the city site and in the eight cardinal directions. The northeast direction, where the tutelary deity stays, was the most important one and had to be kept secret because the sacred ceremony could be ruined by a malevolent person.

In later years, during the reign of King Tilokkaraj (CMC-5.03V), a Burmese monk who knew of the Chiang Mai plan convinced the King to cut down the city's

Table 13.1 Comparative study of the *Chiang Mai* site selected from the seven auspicious factors and *Vaastu Shastra* principles.

<i>Vaastu</i> Principle	Decoding the Seven Auspicious Factors (AF)
<ul style="list-style-type: none"> • The first essential of town planning is to examine the soil and surrounding climate. • The town must have a green belt of forests where tall trees, plants and flowers are found in abundance. This is necessary not only from the point of view of a healthy climate. 	<p>From AF (1): the presence of deer families, which were herbivores, indicated that the soil was sufficiently fertile in this area to sustain life.</p> <p>From AF (2): the presence of a bloodhound coexisting with a doe implied the presence of a variety carnivorous <i>and</i> herbivorous species. The carnivores were no danger to humans, allowing humans to live safely and to have enough food to eat.</p> <p>From AF (3): Tai people believe that an albino mouse is an auspicious animal indicating fruitful soil and water. Furthermore, a large <i>ficus lacor</i> tree, a perennial plant, is used to indicate a yearly cycle because it grows young shoots only three days a year. The presence of large trees or a forest at the site further affirmed the suitability of the area for human habitation.</p>
<ul style="list-style-type: none"> • The eastern side of the town should be lower in order for the Sun to shine on the front doors of houses and buildings • The site should not be situated on the western side of a mountain 	<p>From AF (4): the western topography was high, and sloped down towards the east. The city is on the eastern side of the mountain. Suthep Mountain, located to the west, was regarded as sacred not only by the native Lawa people, but it also was revered by the Mon as the abode of Haripunchai's legendary creator, the Sacred Rushi named Sudeva. The mountain thus ensured spiritual stability, and physical protection in the west.</p> <p>Furthermore, the land sloped down from the west (Suthep Mountain) towards the east (Ping River). According to <i>Vaastu</i> principles, if it rained heavily, the area would not be flooded because the rainwater would flow into the river.</p>
<ul style="list-style-type: none"> • The site should be located on the bank of a river or a lake, or on the seashore 	<p>From AF (5): The forest on Suthep Mountain was fertile, and the Mountain was an important source of water. People would have plenty of water to drink and use throughout the year. They could make a living from agriculture and livestock farming.</p> <p>From AF (6): The Mae Kha stream cascaded down from the top of Suthep Mountain, then turned east and flowed along the south side of the auspicious area. People living in different areas would have access to fresh water.</p> <p>From AF (7): The Ping River flowed to the east of the Chiang Mai city site. The Ping River was also a good omen in that it flowed from Anodat Lake (Sra Anodat) in another mountain range (at Chiang Dao), and flowed constantly in the east of the city. People could drink its sacred water and use it for transportation and commerce.</p>
<ul style="list-style-type: none"> • A water place should be in the northeast 	<p>From AF (6): There was a large reservoir (or lake) to the northeast of the city site where animals could drink. This reservoir could be used as a secondary water resource during the dry season. It could also be a river port used for trading with other cities to bring prosperity to Chiang Mai and its population.</p>

guardian tree and destroy the city wall in that direction. Lanna people believed that because of this event Chiang Mai then lost its independent to Burma (CMC-5.22V).

The Chiang Mai wall therefore is not constructed in a rectangular shape of 900 *wa* by 1,000 *wa*. The wall is a square shape aligned to the cardinal directions. Since the city was built in CE 1296, the site was located on a flat area between Suthep Mountain and the Ping River. There are four corners (Jaeng) that form ramparts in the cardinal directions, and their names, latitudes, longitudes and elevations are listed below:

Jaeng Sri Bhumi in the north-east corner (18° 47' 42.323" N; 98° 59' 36.773" E; 312.2 ± 3 m)

Jaeng Katam in the south-east corner (18° 46' 53.159" N; 98° 59' 33.629" E; 312.2 ± 3 m)

Jaeng Gu Huang in the south-west corner (18° 46' 54.449" N; 98° 58' 41.040" E; 312.3 ± 3m)

Jaeng Huo Lin in the north-west corner (18° 47' 43.971" N; 98° 58' 43.572" E; 316.3 ± 3 m).

Table 13.2 shows that the length of each of the four sides of Chiang Mai city measured approximately 1.6 kilometers. Note that both rectangular and square shapes were recommended for town planning in *Vaastu Shastra*.

13.4.3 Chiang Mai Site Planning

From the actual size of a square shape, we initially assumed that the site would be either the 9 × 9 divided site called *Paramasayika Mandala* (81 squares), or the 10 × 10 divided site named *Asana Mandala* (100 squares) shown in Fig. 13.4. However, after we measured the size of the city and found that it was a square shape with walls 1.6 km × 1.6 km, then using 1-*wa* = 2 meters, the shape could also be 800-*wa* × 800-*wa*, or an 8 × 8 divided site called *Manduka Mandala* (64 square), as in Fig. 13.4.

Table 13.2 The lengths of the Chiang Mai city walls.

Source of Data	Length of each side(corner-to-corner) in km			
	east	south	west	north
Calculated using Google Map co-ordinates	1.551	1.553	1.560	1.584
Calculated using GPS data listed above	1.521	1.538	1.531	1.556
https://th.wikipedia.org/wiki/กำแพงเมืองเชียงใหม่	1.62	1.63	1.62	1.67
Thai Fine Arts Department registration no. 0003557	1.55	1.60	1.55	1.60
<i>History of Lanna</i> (Ongsakul, 2005)	1.6	1.6	1.6	1.6

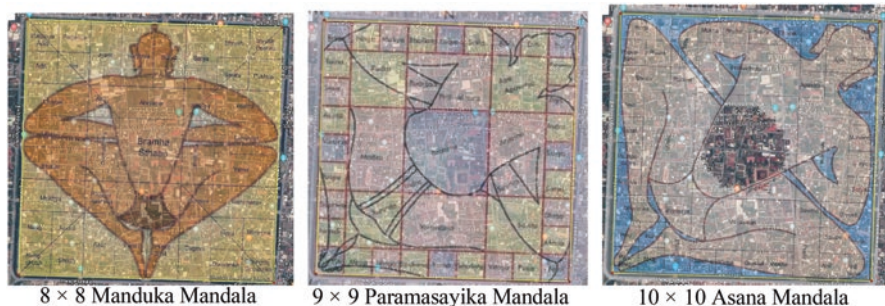


Fig. 13.4 Three different types of *Vaastu-Purusha-Mandala* superimposed on the map of Chiang Mai city.

Considering that the inner-most square (the *Brahma*) should contain Wat Jai (meaning ‘heart’, present name Chai Phra Kiat), Wat Intrakhin and Wat Chedi Luang, we found that the central square with four small grids of the *Manduka Mandala* was too small to accommodate Wat Chedi Luang. We also found that the central part of the *Asana mandala* was as wide as 16 grids, which did not fit the temple periphery. We found that the *Paramasayika* contains nine grids that fit the temple periphery. Therefore, this 9×9 mandala was probably used in planning Chiang Mai, according to *Vaastu-Purusha-Mandala*.

Referring to *Vaastu Shastra*, roads running along the Eastern axis will receive purification by the Sun’s rays from morning to evening, while the North-South roads will provide perfect air circulation and the benefit of a cool breeze. Even though there is no picture of Chiang Mai city streets dated back over 700 years ago, an 1893 map of Chiang Mai (see Fig. 13.5) can still provide evidence of the road layout since the positions of several important temples are shown in the map. Considering that map instead, we find that Chiang Mai roads were laid out along East-West axis and North-South axis, in accordance with *Vaastu* principles. Note that the road layout almost exactly matches the 81 square mandala.

13.4.4 Comparative Study of Vaastu Directions and Lanna Beliefs

Vaastu Shastra is based on the beliefs that man and Universe are analogous in their structure and spirit. The story on the origin of the *Vaastu-Purusha-Mandala* implies the importance of spirit of the site (Earth) in order to create harmonious living among men, the Earth and the cosmos. The Earth is constantly moving, but the site of Chiang Mai is essentially demarcated by a set of directions, i.e., sunrise on the east, and sunset on the west. Adhering to auspicious *Vaastu* directions will ensure healthy living.

Fig. 13.5 Top: Map of Chiang Mai, year 1893 (source: National Archives of Thailand); Bottom: Layout of roads and temples that interconnected the site to the area outside (modified from Tunsuwat, 2014: 23, 44, 59). Note: *Paramasayika* (9×9) *mandala* represented with a yellow grid; (1) Wat Jai, (2) Wat Intrakhin, and (3) Wat Chedi Luang are located in the *Brahma* indicated as a red square; (4) Hai-ya graveyard is located; shading blocks are temple areas; the layout in 1893 is in black colour and blue indicating water, but the faded brown overlay indicates layout in the year 1978.



Lanna people also have a set of beliefs passed down through many generations. Some traditions are still in practice today. The fortification of the city of Chiang Mai has always been unique—technically, physically, and spiritually. The core concept of the fortification of Chiang Mai signified the boundary of the Auspicious City, whose fortified area, as well as the five gates, and the central spot, were believed to be blessed and protected by all of the sacred beings petitioned through the offering ceremonies made by King Mangrai himself.

In Table 13.3 we investigate auspicious *Vaastu* directions and compare them with ancient Lanna beliefs, traditions and local customs about auspicious orientation.

According to the beliefs about the directions, the Lanna King must enter the city through the north gate. Each year, Lanna people hold a ceremony at the northeast corner where they worship the city's guardian spirit. There is also an annual ceremony at the city pillar at Wat Chedi Luang to worship the founding of the city. Whenever someone dies, the body must be transported out through the south gate (the Hai-ya Cemetery is to the southwest). These customs and traditions are in accordance with *Vaastu Shastra* principle.

13.5 The Cosmological Plan of the City

King Mangrai sought an auspicious date for the city's founding using the Lanna lunar calendar, which is based on the *Culasakaraj* (CS) system. Between the eleventh and the thirteenth centuries, the Lanna Kingdom and peripheral regions adopted the Makaranta reckoning calendar from the Pagan Empire in Burma. This was a lunisolar system based on an older version of the Hindu calendar. In this calendar the months are based on lunar months, and years are based on the Indian sidereal year, with an average year length of 365.25875 days (Saelee et al., 2018). The Lanna Kingdom, however, renamed this calendar system as the CS calendar.

The start of the CS calendar is calibrated to 25 March 638 (Gregorian date), which marks the beginning of the New Year as the Sun enters the first point of *Mesha Rashi* (Aries). Most Lanna astrologers follow the CS system and have appointed the New Year's Day of each year to be the day the Sun enters *Mesha Rashi*, which is considered the auspicious day called the *Thaloeng Sok* day. The *Rashis* or astrological signs are represented by 12 equal segments of 30° each in a circle, as depicted in Fig. 13.6.

Two auspicious days were chosen by King Mangrai: one for the move-in date to the selected site described in Sub-section 13.5.1, and the other for the start of construction, as analyzed in Sub-section 13.5.2. Interpretations of the selected dates based on astronomical and astrological aspects are discussed in Sub-section 13.5.3.

Table 13.3 Similarities between *Vaastu* directions and Lanna beliefs.

According to <i>Vaastu</i> direction	Beliefs about Auspicious Orientation, Local Customs and Traditions
<p>Center</p> <ul style="list-style-type: none"> • Lord <i>Brahma</i> then ordered that whoever reveres the <i>Vaastu Purush</i> and • Performs the <i>Vaastu Purush Pooja</i> while constructing a temple, palace, house, city <i>etc.</i> will be blessed by the <i>devas</i>. • Those who do not perform the <i>Vaastu Purush Pooja</i> will be destroyed by the <i>asuras</i>. 	<p>Lanna people call the center of the city Sadue Muang (or Navel) where the Inthakhin City Pillar, Wat Inthakhin Sadue Muang, Wat Jai and Wat Chedi Luang are located.</p> <p>Nowadays, Chiang Mai people traditionally believe that the city’s guardian spirits resides at each gate and corner, and they help maintain the city’s prosperity and fertility. To this day, ceremonies are held simultaneously at these cardinal points to propitiate these spirits.</p> <p>The Inthakhin or Lak Mueang (City Pillar) Festival in Chiang Mai (also known as Sai Khan Dok) starts on the 12th day of the waning moon of the 6th lunar month and lasts for eight days. This is a celebration of Brahmic origin.</p> <p>Lanna people believe that the reason why the Lanna Kingdom lost its independence and was under the Burmese rule from the end of the Mangrai Dynasty was because King Mekhuthi (<i>r.</i> 1551–1564) did not worship the Inthakin City Pillar and abandoned the sacred celebration.</p> <p>The belief about the connecting power from the stones of eight directions to the center is still present to this day. Prior to any construction, there will be a foundation stone-laying ceremony. The sacred ceremony is bounded by the eight talisman stone pillars for the eight directions.</p>
<p>Northeast direction</p> <ul style="list-style-type: none"> • The head of <i>Vaastu-Purusha-Mandala</i> lies in the northeast direction • Ruled by Lord Shiva • Planet: Jupiter 	<p>Chiang Mai has a shrine to the city’s guardian spirit, Jao Luang Kam Daeng, because the local native religious beliefs were animistic. The Sri Bhumi Corner in the northeast was considered the most auspicious of the four corners, so King Mangrai began construction of the perimeter wall and accompanying moat at this corner. They were then continued clockwise to complete the whole city wall in accordance with positions of deities in <i>Vaastu-Purusha-Mandala</i>. On the anniversary of the city’s founding, there is a ceremony to worship the city’s guardian spirit based on the idea that a city is like a human being and needs to celebrate its birthday. This belief is similar to <i>Vaastu</i> principles that regard <i>Vaastu-Purush</i> as a cosmic man living inside the plan.</p>
<p>North direction</p> <ul style="list-style-type: none"> • Ruled by Kubera, the God of wealth • Planet: Mercury 	<p>The Lanna King must enter the city through the north gate (Pratu Chang Puek). As mentioned in the Chronicle, King Kawila followed the ancient tradition by entering the city of Chiang Mai through the north gate. Furthermore, any inauspicious object must not be allowed through this gate (CMC-7.10R).</p>
<p>South direction</p> <ul style="list-style-type: none"> • Ruled by Lord Yama, the God of Death. • Planet: Mars 	<p>Pratu Suan Prung, the south gate, had been used for the execution of rebels. The corpses then had to be carried out through this gate, which led to the Hai-ya Cemetery. This belief is in accordance with <i>Vaastu</i> principles that the south is ruled by the God of Death.</p>
<p>Southwest direction</p> <ul style="list-style-type: none"> • Ruled by Lord Pitra – Niruthi ancestor • Planet: Rahu 	<p>The Hai-ya Cemetery was located to the southwest of the city. This direction is an inauspicious direction where Lord Rahu rules based on <i>Vaastu</i> principle.</p> <p>Historically, this corner was used to detain and to punish the third Prince of King Manrai who planned to overthrown King Sanphu (the third King of the Mangrai Dynasty) until he passed away. The soldier who guarded the Prince’s jail cell was praised for his duty, and later the wall corner was named. Jeang Gu Huang (CMC-3.07V).</p>

13.5.1 *The Auspicious Time for Occupying the Site*

Referring to the Chronicle, King Mangrai chose an auspicious time at 4:24 a.m. on the Thaloeng Sok day to move into his new settlement (*Chaiyabhumi*) on Thursday, the 8th day of the waxing moon of the 7th Lanna lunar month in 654 CS or Taosee (Dragon) year, which corresponds to 3 April 1292 (Gregorian date). The Moon was in *Punarvasu Nakshatra* (see Fig. 13.6 the inner circle number 7, which is known as *Rerk 7*).

On the *Thaloeng Sok* day, the Sun moved from *Meena Rashi* (Pisces) into *Mesha Rashi* (Aries). At the selected auspicious time, the Pisces constellation was appearing on the eastern horizon. To precisely illustrate the sky phenomenon at that time, a star map generated by *Stellarium* is shown in Fig. 13.7. This map shows the Sun in Pisces which is slightly different from the Indian astrological calculation due to the equal division of *Rashi*. The map also shows the Moon in Gemini, and Pisces ascendant as stated in the Chronicle.

13.5.2 *The Auspicious Time for Starting Construction*

Another important date listed on the stele at Wat Chiang Man in Fig. 13.8 is the starting date of construction, which was in the year 658 CS or Rawaisan (Monkey) year, on the 8th day of the waxing moon of the 8th Lanna lunar month at an early hour. This date corresponds to 4 a.m. on 19 April 1296 (Gregorian date).

Based on the Lanna lunar calendar, the construction starting date and time were calculated using the position of the Sun and the Moon that reached the auspicious ceremony time. The Moon was in the *Punarvasu Nakshatra* with Pisces ascendant (*Meena Rashi Lagna*).

The planetary positions specified in the inscription in Fig. 13.8 are as follows: Saturn in *Vrishah* (Taurus), Mercury in *Mesha* (Aries), Venus in *Meena* (Pisces), Mars in *Kumbha* (Aquarius) and Jupiter in *Dhanu* (Sagittarius). They coincide with the star map shown in Fig. 13.9. This implies that during that period there was knowledge of how to calculate planetary positions with respect to the zodiac signs. This was probably through Hindu astrology, which used sidereal zodiac signs.

13.5.3 *Interpretation and Discussion*

The two selected auspicious dates were related to cosmological phenomena such as the Moon in *Punarvasu Nakshatra* and the Sun in *Mesha Rashi* at the time Pisces was ascending (*Meena Rashi Lagna*). It can be noted that most of the planets, except Jupiter and Mars, were aligned in zodiac signs that were close to the zodiac sign of the Sun (*Meena*, *Mesha* and *Vrishabha*). Moreover, the *Thaloeng Sok* day, believed

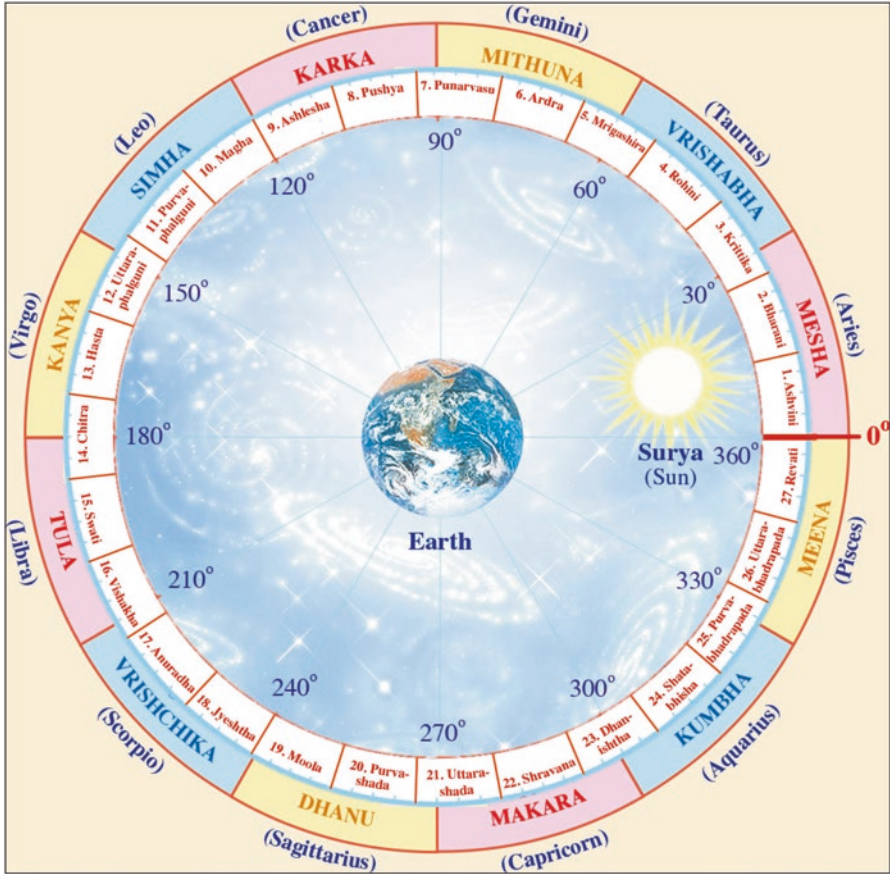


Fig. 13.6 The sidereal zodiac chart of Vedic astrology showing the 12 Signs of the Zodiac or *Rashis* (the outer circle) and the 27 lunar mansions or *Nakshatras* (inner circle) (modified from <https://www.maharishijyotishprogram.eu/images/predictions-nakshatras.jpg>, retrieved February 10, 2020).

to be associated with the vernal equinox, was probably also considered an auspicious date for a new start.

Further discussion on the equinox will be given in Sub-section 13.5.3.1, and astrological aspects on *Punarvasu Nakshatra* and *Meena Rashi Lagna* will be presented in Sub-section 13.5.3.2.

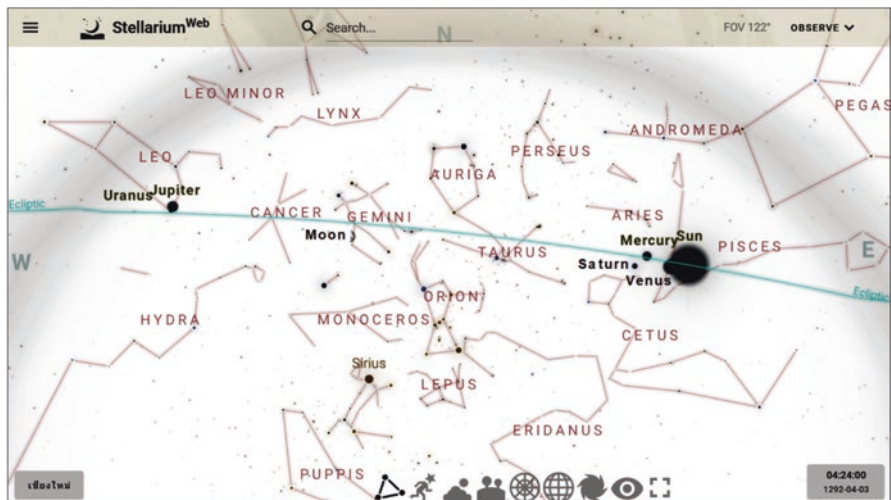


Fig. 13.7 A star map, generated by *Stellarium* (<https://stellarium-web.org/>), shows the location of the Sun, the Moon and other planets appearing in the different zodiac constellations observed at Wat Chiang Man on 3 April 1292 at 4:24 a.m. The Pisces constellation rising on the eastern horizon can be seen on the right in the striped area and marked by the letter ‘E’.

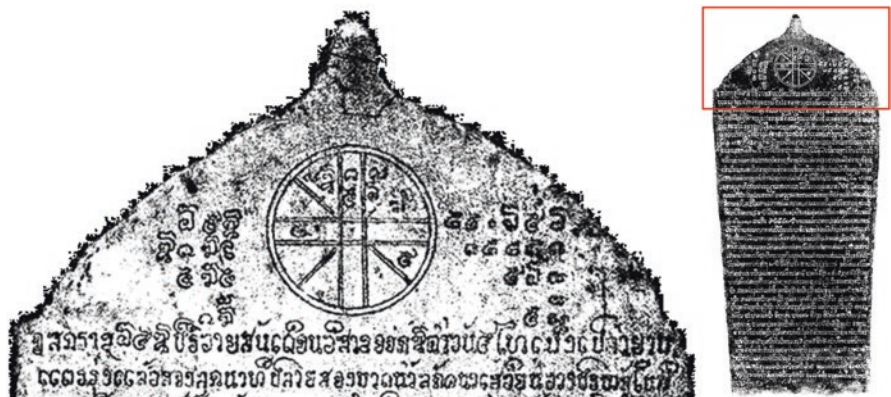


Fig. 13.8 The date and time scripted on the stele of Wat Chiang Man. Right: the whole stele. Left: an enlargement of the portion in the red box and in reversed color for clarity (<https://db.sac.or.th/inscriptions/uploads/images/20160205143618GRq3.jpg>, retrieved February 10, 2020).

13.5.3.1 Astronomical Aspect

According to *Vaastu* principles, the site would be plowed on an auspicious day determined by astronomical observation of a pair of specific oxen having white spots on their heads and knees. However, there is no record of the observation of these two stars in either the *Chiang Mai* Chronicle or the *Wat Chiang Man* stele.

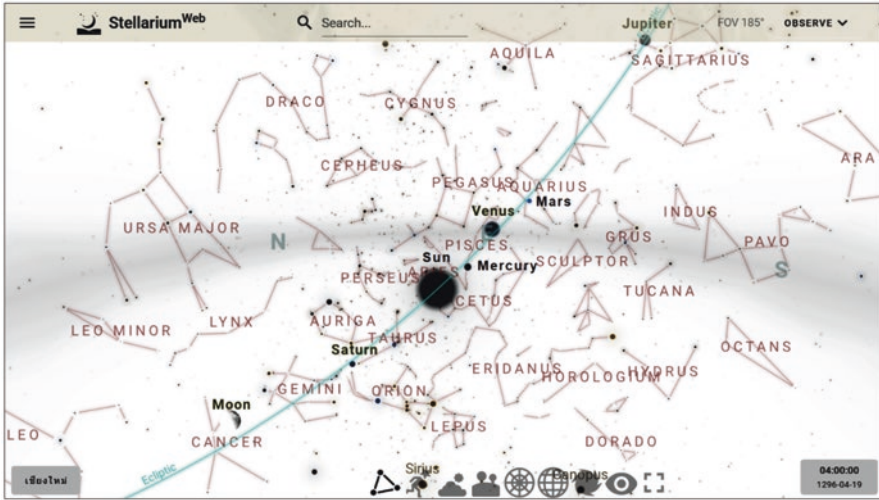


Fig. 13.9 A star map, generated by *Stellarium* (<https://stellarium-web.org/>), showing the locations of the Sun, the Moon and planets appearing in the different zodiac constellations as observed from Wat Chiang Man on 19 April 1296 at 4:00 a.m. In the east is the constellation Pisces and Venus and Mars were rising above the horizon, shown as the striped area marked by the letters ‘N’, ‘E’ and ‘S’.

It can be assumed that Vedic astronomy would have related the rising and setting locations of various stars to the seasons, to the solstices and to the equinoxes. Therefore, it is possible that Aldebaran (or *Rohini* in Sanskrit) and the Pleiades (*Krittikā* in Sanskrit) might rise in the east at the vernal equinox during Harappan times (3000 to 2000 BCE) as the word ‘*rohini*’ literally means ‘rising’. During the Vedic period, the vernal equinox was in Taurus, and it might be considered the beginning of the New Year.

However, the precession of the equinoxes and the difference length between the sidereal and the tropical year were unobserved by ancient people. For naked-eye observers, the shift of the constellations relative to the equinoxes only became apparent over centuries.

For example, Mohenjo-Daro in Pakistan, an important archaeological site during the Vedic and Harappan periods, exhibited slight divergence of $1\text{--}2^\circ$ clockwise in its axes relative to the cardinal directions. Furthermore, slight differences in the orientations of the various buildings at Mohenjo-Daro indicates that different construction periods were used with the same traditional sighting points that shifted over this interval due to precession of the equinoxes (Kenoyer, 1998).

At another historical site, the fourteenth century Vidyashankar temple at Sringeri, Shylaja (2007) discovered that only two pillars are now aligned with the direction of the rising Sun at winter and summer solstices, whereas the others are no longer orientated to their correct zodiacal signs. The signs shift with respect to the constellations by 1° in about 72 years due to the precession.

Although during a period of CE 1292–1296, Pisces (*Meena Rashi*) rose in the east on the vernal equinox, Lanna astronomers instead used the Thaloeng Sok day, the day the Sun entered *Mesha Rashi*, as New Year's Day.

13.5.3.2 Astrological Aspects

According to Vedic astrology, the symbol of Pisces is two fish. It is worthwhile considering the significance of this sign when humanity is at the threshold of a new beginning and a new cycle. Pisces is feminine, watery, and common, which is related to the preservation principle. Jupiter is a ruler of Pisces. As an ascendant Lord, it will encourage individuals to grow and prosper in this world. The Hindu, Christian, Pagan and many other regions have shown much reverence for fish. It is one of Lord Vishnu's incarnations known as *Matsyavatar*. It was this god who taught mankind to build houses and cultivate land. Ancient Brahmans and the Babylonians also connected fish to their Messiah. Pisces is indeed an auspicious sign with an auspicious beginning (Shah, 2020).

It is interesting to note that King Mangrai chose *Punarvasu* for the auspicious time of both events. *Punarvasu* is the birth *Nakshatra* of Lord Rama, the eternal-incarnation of God (Lord Vishnu) on Earth. He is the central figure of the ancient Hindu *Ramayana* epic, that has long-established deep cultural bonds between India and Thailand since the sixth century CE. He is considered a supreme being who fulfilled all his moral obligations. King Ram Khamhaeng of Sukhothai and all the kings of the current Chakri Dynasty of Thailand are often referred to as Rama. Even Ayuttaya, a prosperous kingdom that existed for over four centuries, was named after Ayodhya, Lord Rama's birthplace. Therefore, it is possible that King Mangrai might have been influenced by the ideology of Lord Rama to choose *Punarvasu*. As the star *Punarvasu* was in the ascendant, the five planets (Sun, Mars, Jupiter, Venus and Saturn) were in their respective exaltation positions. *Punarvasu* is known as the *Nakshatra* of renewal, repetition, and repeating patterns. Pisces ascendant and the *Punarvasu Nakshatra* were also chosen for auspicious events in Bangkok, and in other cities and temples. It would be interesting to investigate their popularity for auspicious times in the future.

13.6 Concluding Remarks

We find that the Chiang Mai city planners had seven good reasons (omens) for choosing the location for the new capital city of the Lanna Kingdom when King Mangrai explored the site. The reasons included topographical aspects (*e.g.*, flat land, a mountain, a river and a stream), natural water resources and the fertility of the soil, all of which would help promote harmony between the humans and local plant and animal varieties. The position and direction of the large lake in the north-east was also taken into consideration. Furthermore, King Mangrai ordered that city

construction would start from the Sri Bhumi corner. Besides the seven good omens, we also investigated ancient Lanna norms, customs and traditions that were passed from generation to generation. Some practices are still applied to this day.

The results of this investigation suggest that the planning of Chiang Mai city was influenced by *Vaastu Shastra* (an ancient Hindu architectural knowledge base), combined with traditional concepts and beliefs, indigenous Khmer knowledge and technology, Vedic cosmological concepts, and possibly ideas held by the King of Sukhothai.

The city might have been designed using a *mandala* of be 9×9 divided sites (81 squares) in the *Paramasayika* design. This has a symbolized human figure with the face and the stomach touching the ground lying with his head facing the northeast corner and his legs at the southwest corner. The form was to represent a human living in complete harmony with nature. The city planning thus symbolized a peaceful and a prosperous person.

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