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The "Ideal" Hindu City of Ancient India as Described in the *Arthaśāstra* and the Urban Planning of Jaipur

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INTRODUCTION

Jaipur is a unique city planned during the early modern period in India. Its construction started in 1727 on the initiative of Jai Singh II, the Hindu ruler of the local Rajput kingdom. The walled city has a so-called "grid" street pattern and is composed of square blocks as shown in Fig. 6. In order to understand what were the intellectual foundations underlying the urban planning of Jaipur, it is necessary to trace the origins of the grid pattern tradition and the philosophical backgrounds of cities on the Indian subcontinent.

1   THE GRID PATTERN TRADITION IN INDIAN URBAN HISTORY

The Indian subcontinent has a long urban history dating back to the Indus civilization. Compared with the three other ancient major civilizations in the world, Mesopotamia, Egypt, and North China, the Indus civilization is characterized by an urban pattern that shows strong favouritism towards a "quasi-grid" city street pattern.

   Kalibangan in north Rajasthan presents us with a good example for considering the urban pattern of the Indus civilization. The site of Kalibangan is composed of two sections, the citadel area in the west and the city proper in the east. Each area is surrounded by an outer rectangular wall. The characteristics of the urban form found in Kalibangan—namely, "topographical dualism" composed of the citadel in the west and the city area in the east, and the rectangular shape of each city wall—is commonly found in the other major cities of the Indus civilization, including well-known Mohenjodaro in Sind and Harappa in the Punjab, Pakistan.

   Inside the city area, four or five main streets have been excavated which run almost parallel with each other from north to south. However, from east to west, we cannot find a street passing through the city area from wall to wall. Instead, shorter streets have been excavated which connect two neighbouring north-south main

streets at right angles. This is why we call the street pattern found at Kalibangan a "quasi-grid" arrangement. A similar street pattern is found in other typical urban sites of the Indus civilization, such as Mohenjodaro and Lothal in Gujarat, India (Karashima et al. 1980, 47–59).

After the Indus civilization, a grid pattern cityscape is found in the ancient city of Sirkap in the northwestern Punjab, Pakistan. Sirkap flourished from the second century B.C. to the first century A.D. In contrast to the cities of the Indus civilization, Sirkap shows a perfect grid pattern. A wide main street runs straight through the city from north to south; and narrow streets running from east to west cross it at right angles. The intervals between the narrow east-west streets are approximately equal. It is said that the grid pattern of Sirkap was influenced by the Greek urban form. However, we can see in it a continuity of favouritism towards the grid pattern since the Indus civilization and Vedic India.

The ideal urban pattern of ancient Hindu India is discussed in the *Silpaśāstra*, a group of Sanskrit texts dealing with city planning, architecture, sculpture, painting, etc. The representative text on urban planning is *Mānasāra*, which is thought to have been written in South India during the sixth and seventh centuries A.D. It gives sketches of eight types of ideal urban forms. Six of them show perfect and quasi-grid patterns. The remaining two are lotus flower and semi-circular patterns. Similar descriptions and sketches of urban forms are found in the *Mayamata*, the other Sanskrit text on urban planning which is contained in the *Silpaśāstra*. What this means is clear favouritism towards the grid pattern in the discussion of what constitutes ideal urban form in ancient Hindu texts.

However, it is impossible to trace an actual grid pattern in the ancient Indian subcontinent due to the undevelopment of archaeological excavations. There is only one example of an urban settlement which is estimated to have had a grid pattern, and that is Śiśupālgarh in Orissa, India. Śiśupālgarh was a fortified city of the first and second centuries A.D. It had a square city wall of almost one and half kilometres on each side. Each edge of the wall had two gates, that is, eight in total. If we draw lines between opposing gates, the area inside the city wall can be divided into nine perfect squares. Unfortunately at the present time we cannot say any more about Śiśupālgarh because of the lack of excavation.

Another Sanskrit text which discusses the ideal urban form and internal structure in detail is the *Arthaśāstra*. It gives a rather clear idea about the ideal royal capital city. In the next chapter, we shall focus on reconstructing an ideal city using the *Arthaśāstra*.

2 RECONSTRUCTION OF AN IDEAL CITY

The *Arthaśāstra* is a Sanskrit text which concentrates on discussing the pursuit of the wealth of the nation. The author of the text is assumed to be Kauṭilya, a legendary hero of India who is believed to have been prime minister to Chandragupta I, the founder of Maurya dynasty around the end of the fourth century B.C. A more

reasonable explanation is that the text was compiled between the second century B.C. and 200 A.D. (Kamimura 1984, 80).

Ideal urban form and structure is discussed in Chapters 3 and 4 of the Second Book. These two chapters are significant for considering and reconstructing the ideal city of ancient India.

The text

First, here is an English translation of the important parts of Chapters 3 and 4 (Shamasastry 1967, 50–55).

In Chapter 3, the construction of a fortified market city (*sthānīya*) is described as follows.

1. *Urban form:* "The king may have his fortified capital (sthānīya) . . . in the centre of his kingdom: in a locality naturally best fitted for the purpose, . . . a fort, circular, rectangular, or square in form, surrounded with an artificial canal of water and connected with both land and water paths (may be constructed)."

2. *City moat and wall:* "Round this fort, three ditches with an intermediate space of one daṇḍa (six feet) from each other, fourteen, twelve and ten daṇḍas respectively in width, . . . At a distance of four daṇḍas (24 feet) from the (innermost) ditch, a rampart, six daṇḍas high and twice as much broad, shall be erected."

Chapter 4 gives a detail discussion of the street pattern and spatial arrangement of public and private buildings within the fortified city.

3. *Royal roads and their width:* "Demarcation of the ground inside the fort[ified city] shall be made first by opening three royal roads from west to east and three from south to north. . . . Chariot roads, royal roads, . . . shall each be four daṇḍas ([about] 24 feet) in width."

4. *City gate:* "The fort[ified city] shall contain twelve gates, provided with both a land and water way and a secret passage."

5. *Temple:* "In the centre of the [fortified] city, the apartments of gods, such as Aparājita, Apratihata, Jayanta, Vaijayanta, Śiva, Vaiśravana, Āśvina, and the abode of Goddess Madirā shall be situated."

6. *King's palace:* "In the midst of the houses of the people of all the four castes and to the north from the centre of the ground inside the fort[ified city], the king's palace, facing either the north or the east shall . . . be constructed, occupying one-ninth [or the ninth quarter] of the whole site inside the fort[ified city]."

7. *East by north to the palace:* "Royal teachers, priests, sacrificial place, water reservoir and ministers shall occupy sites."

8. *East by south:* "Royal kitchen, elephant stables, and the store-house shall be situated on sites."

9. *On the eastern side:* "Merchants trading in scents, garlands, grains, and liq-
    uids, together with expert artisans and the people of Kshatriya caste shall
    have their habitations."

10. *South by east:* "The treasury, the accountants' office, and various manufac-
    tories shall be situated on sites."

11. *South by west:* "The store-house of forest produce and the arsenal shall be
    constructed on sites."

12. *To the south:* "The superintendents of the city, of commerce, of manufac-
    tories, and of the army as well as those who trade in cooked rice, liquor,
    and flesh, besides prostitutes, musicians, and the people of Vaiśya caste
    shall live."

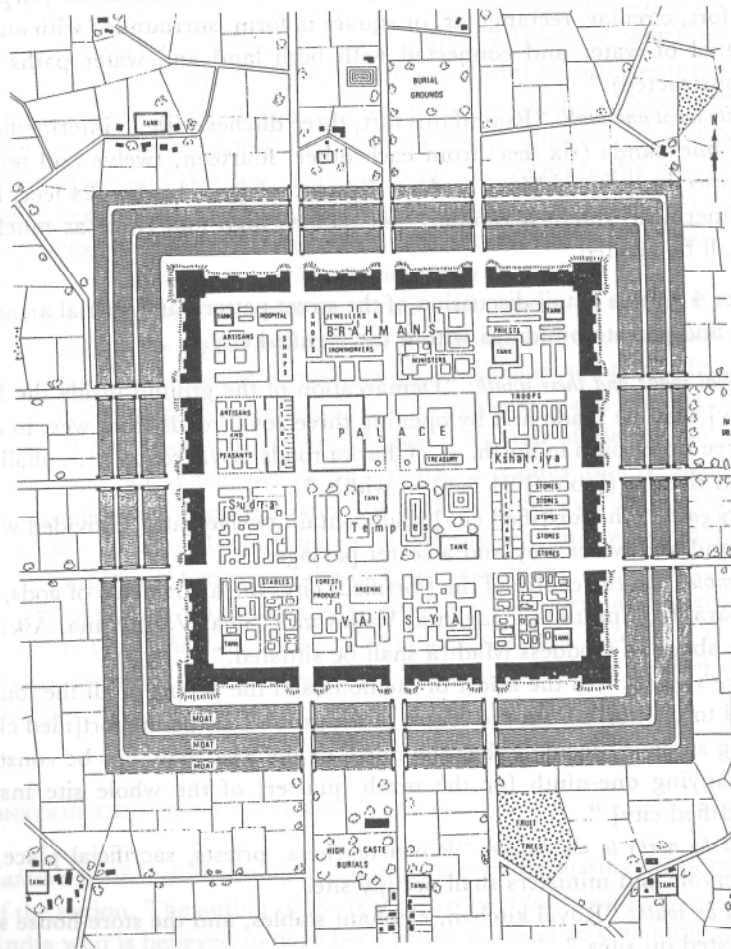13. *To the west by south:* "Stables of asses, camels, and working house."

Fig. 1 Reconstruction of the fortified city based on the *Arthaśāstra* (Kirk 1978, 70)

14. *To the west by north:* "Stables of conveyances and chariots."

15. *To the west:* "Artisans manufacturing worsted threads, cotton threads,
    bamboo-mats, skins, armours, weapons, and gloves, as well as the people
    of Śūdra caste, shall have their dwellings."

16. *To the north by west:* "Shops and hospitals."

17. *To the north by east:* "The treasury and the stables of cows and horses."

18. *To the north:* "The royal tutelary deity of the city, ironsmiths, artisans work-
    ing on precious stones, as well as Brāhmans shall reside."

Conventional reconstructions

The above quotations offer valuable information on the form and the internal ar-
rangement of buildings in the fortified capital city of ancient India. Some scholars
already have attempted to reconstruct maps of the ideal city by using the above text
from the *Arthaśāstra*. I shall present here two studies, one by W. Kirk of England
(Kirk 1978, 70) and one by P. V. Begde of India (Begde 1978, 36). Their tentative
reconstruction maps are shown in Figs. 1 and 2 respectively.

The disposition of the three moats and one wall which surround the city is
depicted correctly in Kirk's map (Fig. 1). However, he assumes the innermost
moat is the widest. In Quotation 2 above, the width of each moat is clearly laid
down, but the text does not give any idea of the order in which the three moats are
to be dug. Contrary to the reconstruction plan by Kirk, it is probably better to set
up the widest moat on the periphery for the maximum protection of the capital city
against military attacks.

Based on Quotation 3, both Figs. 1 and 2 sketch out three royal roads running
east to west and the three of royal roads running north to south and intersecting at
right angles. This arrangement divides the city area into a grid of sixteen sections.
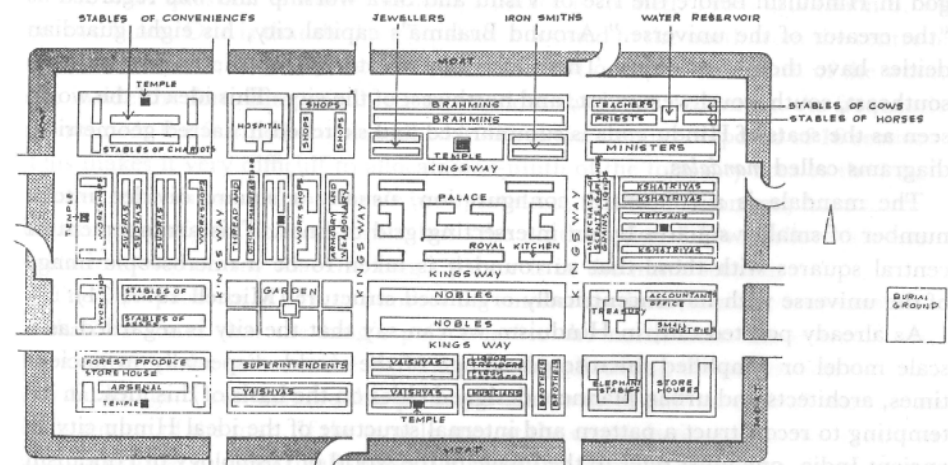

Fig. 2 Reconstruction of the fortified city based on the *Arthaśāstra* (Begde 1978, 36)

Kirk and Begde differ with respect to the shape of the city outline. Kirk adopts a square urban form, and Begde adopts an oblong one. The text does not give any information about this aspect. Therefore each estimation is indeed a reasonable hypothesis, because, as mentioned above, the ideal urban forms referred to in the *Mānasāra* are mainly square or oblong types.

The two maps are quite different in the arrangement of the buildings inside the fortifications, especially in determining the site of the king's palace and the temple. Their reconstructions are purely arbitrary especially on this point.

A new interpretation and reconstruction

Kirk and Begde have failed to consider the cosmology and urban planning philosophy contained in Hinduism. To avoid the arbitrariness of their interpretations, we should strictly read the text bearing in mind the Hindu idea of a city. In Hinduism, the city is regarded as a scale model of the world. But, what world?

The *Vishnu-purana*, one of the sacred texts of Hinduism, explains the structure of the world as follows (Sadakata 1985:74–86):

> The world consists of seven concentric continental belts with the Jambu continent at the centre. Each continent is surrounded by a circular ocean. This means that the world is composed of seven concentric continental rings and the same numbers of oceans lying between each of the continents. The Jambu continent has a discoid shape whose diameter is assumed to be 100,000 *yojyanas* (about 1.5 million km). At the central portion of Jambu the golden mountain of Meru rises to an altitude of 84,000 *yojyanas* (about 1.26 million km). It has a flat top 32,000 *yojyanas* (about 0.48 million km) across.

In the centre of the flat top, which is the real centre of the world being the central point of Jambu, there is located the capital city of Brahmā. Brahmā was the greatest god in Hinduism before the rise of Visnu and Śiva worship and was regarded as "the creator of the universe." Around Brahmā's capital city, his eight guardian deities have their own cities. Their locations are to the north, northeast, east, southeast, south, southwest, west, and northwest of the city. This idea of the world seen as the seats of Hindu gods is summarized and sketched in sacred geometrical diagrams called *mandalas*.

The mandala is a concentric configuration, usually a square divided into a number of smaller squares by an intersecting grid of lines. This arrangement of central squares with those that surround it is taken to be a microscopic image of the universe with its concentrically organized structure (Michell 1977, 71).

As already pointed out, in Hinduism we can say that the city is regarded as a scale model or simplified microscopic image of the world. Especially in ancient times, architects and urban planners designed cities on the basis of this idea. In attempting to reconstruct a pattern and internal structure of the ideal Hindu city in ancient India, one must refer to the image of the world or cosmology of Hinduism which is systematically depicted in the mandala form. This viewpoint is completely

ignored in the reconstruction maps prepared by Kirk and Begde.

The *Silpaśāstra* presents the *Vastu-Purusha* mandala for architectural and urban planning purposes. *Vastu-Purusha* is a general name for a variety of mandalas which have different numbers of smaller squares ranging from 1 (1 by 1) to 1,024 (32 by 32). Of them, the *Maṇḍūka* (Fig. 3) and the *Parama-śādhika* are most frequently referred to regarding urban and architectural plans. The former is composed of 64 (8 by 8) smaller squares, and the latter is divided into 81 (9 by 9) smaller sections. They commonly have Brahma-sthana (the area of Brahmā) at their centre. In the former, the central 4 (2 by 2) smaller squares are regarded as this area. In the latter, the central 9 (3 by 3) smaller squares are thought to be the area of Brahmā.

I have chosen to adopt the former mandala, the *Maṇḍūka*, as the frame of reference for attempting to reconstruct the ideal fortified city described in the *Arthaśāstra*. The reason for adopting it is as follows. The *Arthaśāstra* says that two sets of three royal roads running from east to west and from north to south cross each other at right angles (Quotation 3). This means that the city area is to be divided into 16 sections by their intersection. The *Maṇḍūka* mandala is composed of 64 smaller squares. Since multiplying 16 by 4 we get 64, it follows that the 4 smaller squares in the *Maṇḍūka* mandala constitutes one of the 16 sections in the *Arthaśāstra*'s city plan. We do not get such a conformity between the *Arthaśāstra*'s 16 sections and the 91 smaller squares in *Parama-śādhika* mandala.

According to Quotation 5, the *Arthaśāstra* allocates the central section to the apartment of gods, i.e., the temple. The *Maṇḍūka* mandala assigns the central four smaller squares to the jurisdiction of Brahmā. There is agreement between these two statements, because both regard the sections at the centre as a sacred domain. In my reconstruction map presented in Fig. 4, the temple area occupies the 4 central smaller squares at the intersection of the two middle royal roads represented by large block no. 1.

The next question is where the king's palace is located. From Quotation 6, we get two hints. One is that the king's palace is located to the north from the centre of the ground inside the fort; and the other is that it occupies one-ninth of the whole site inside the fort. First of all, let us consider the latter statement. As frequently mentioned, the fortified city described in the *Arthaśāstra* is composed of 16 sections. This makes it very difficult to allocate one-ninth of the total city area to the king's palace. According to Kamimura's interpretation, this expression may have another meaning signifying not one-ninth, but "the ninth section." If we follow this interpretation, we can say that the king's palace is in the ninth section.

The next problem is how to number the smaller sections from no. 1 upward. The *Arthaśāstra* states that the king's palace is "to the north from the centre." This phrase means the centre is the starting point for allocating the palace and the other city buildings. I can assume this principle allows us to plot an ordinal number on each section of the map. If the temple area at the centre is situated at no. 1, and we give an ordinal number to all the sections starting from the centre, we must arrange it in a circinate order from the centre to periphery. In Hinduism, the circinate
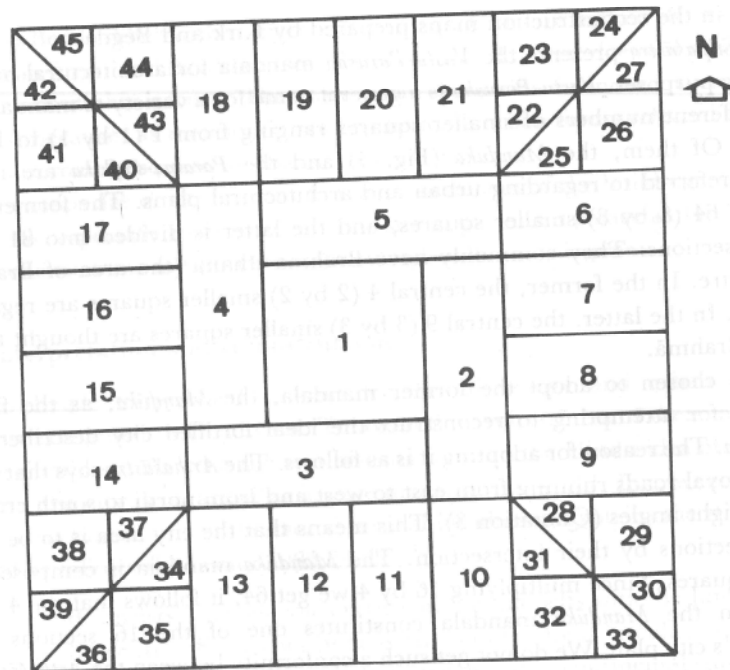
1 Brahmā	2 Āryaka	3 Vivasvant	4 Mitra
5 Bhūdhara	6 Mahendra	7 Āditya	8 Satyaka
9 Bhṛśa	10 Rākṣasa	11 Yama	12 Gandharva
13 Bhṛṅgarāja	14 Puṣpadanta	15 Jalādhipa	16 Asura
17 Śoṣa	18 Bhallāṭa	19 Soma	20 Mṛgo
21 Aditi	22 Āpa	23 Diti	24 Īśa
25 Āpavatsa	26 Jayanta	27 Parjanya	28 Savindra
29 Antarikṣa	30 Agni	31 Sāvindra	32 Vitatha
33 Pūṣan	34 Indra	35 Mṛṣa	36 Pitṛ
37 Indrarāja	38 Sugrīva	39 Dauvārika	40 Rudra
41 Roga	42 Vāyu	43 Rudrarāja	44 Mukya
45 Nāga			

Fig. 3 *Maṇḍūka* mandala drawn in Dagens 1970

order generally means a right-hand rotation. This order is represented by the smaller block numbers in Fig. 4. The ninth section, which is shown in vertical smaller block numbers in Fig. 4. The ninth section, which is shown in vertical stripe and with large block no. 2 in the figure, coincides with the northeast section of the temple area. This is, I believe, the king's palace.

Quotation 6 states that the king's palace faces to the north or the east. The king's palace area which is determined in this way in Fig. 4 does indeed have edges facing north and east. It means that at least my interpretation of the ninth section satisfies the above requirement stated in Quotation 6. The *Mānasāra* contains further proof that supports my determination of the site of the king's palace. If we compare Figs. 3 and 4, the location of the king's palace in the latter figure is identical to the area of the god Bhūdhara in the *Maṇḍūka* mandala. The *Mānasāra* describes the palace of the kings of Narenda rank as located in the area of Bhūdhara called
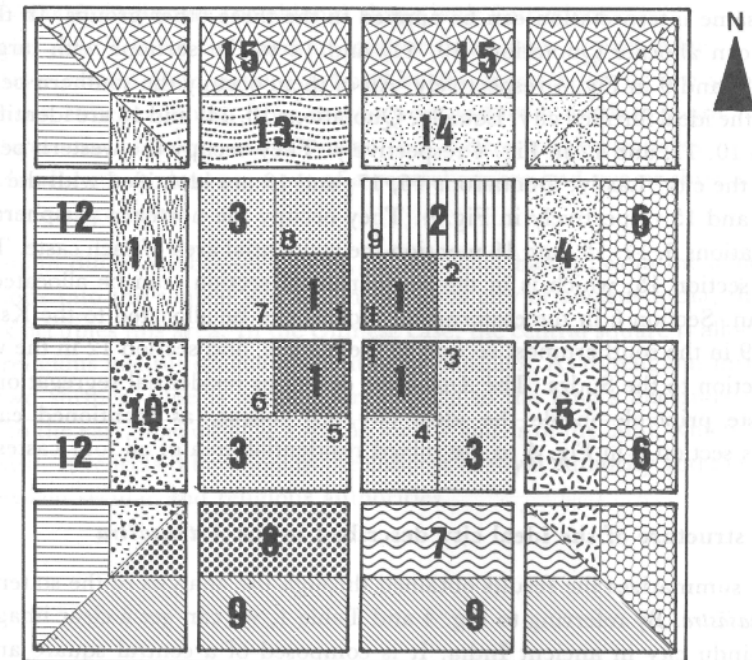
Fig. 4 New reconstruction of the fortified city based on the *Arthaśāstra*.
NOTE: Numbers in large block form correspond to those in Table 1.

Kubera (or the area of Soma in Fig. 3). In my reconstruction of the ideal city, the king's palace should be allocated to the area of Bhūdhara. This allocation accords with the statement of *Mānasāra*.

Quotation 6 also describes that the king's palace is in the midst of dwellings of people of all four castes. By Kamimura's interpretation, this zone is the best residential area in the ideal city. Therefore, I have allocated all the remaining sections around the temple, except the king's palace area, to the residential area of all four castes shown with the large block no. 3 in Fig. 4. This completes the central part of the ideal fortified city. Now let us proceed to the peripheral zone.

By examining Quotations 7 through 18, I have classified them into four groups consisting of three statements each. Concerning the first group for 7, 8, and 9, they commonly describe the location of public and private buildings and activities in the eastern section of the king's palace. They explain separately the situations "east by north," "east by south," and "on the eastern side." There is a difference in the style of description, namely, between the first two (Quotations 7 and 8) and the last one (Quotation 9). The first two divide the inner eastern area into two sections, north and south, by using the expressions of "east by north" and "east by south." Quotation 9 designates the belt area behind them by using the expression of "on the eastern side." Now I can allocate the sections designated by Quotations 7, 8, and 9 to those of large block nos. 4, 5, and 6 in Fig. 4 respectively.

The same interpretation can be applied to the three other groups. In the same way, I can allocate Quotations 10, 11, and 12 to the sections with large block nos. 7, 8, and 9 in Fig. 4 respectively. All of them occupy the southern peripheral zone in the ideal fortified city. Equally, Quotations 13, 14, and 15 are identified with sections 10, 11, and 12 in Fig. 4 respectively. They occupy the western peripheral zone in the city. Lastly, Quotations 16, 17, and 18 are identified with the sections 13, 14, and 15 respectively in Fig. 4. They occupy the northern peripheral zone.

Quotations 9, 12, 15, and 18 mention the residential area of each caste. Then, in Fig. 4, section 15, which is in the northernmost section, can be allocated to the Brāhman. Section 6 in the easternmost section can be allocated to the Kshatriya, section 9 in the southernmost section to the Vaiśya, and section 12 in the western-most section to the Śūdra. The *Arthaśāstra* describes residential segregation on the four-caste principle inside the ideal city. Of course, as mentioned earlier, it allocates section 3 in Fig. 4 to the mixed residential area of all four castes.

Spatial structure of the ideal city described in the *Arthaśāstra*

Table 1 summarizes the results obtained through the analysis of the statements in the *Arthaśāstra*. By referring to Fig. 4 and Table 1, we can get a clear image of the ideal Hindu city in ancient India. It is composed of a central square and three square belts surrounding it. Its internal structure may be explained as follows:

(a) Central square (1 in Fig. 4): Temple area.

(b) Inner square belt (2 and 3 in Fig. 4): King's palace in the northeast section and the residential area of the four castes in the remaining sections.

(c) Middle square belt (4, 5, 7, 8, 10, 11, 13, and 14 in Fig. 4): Zone of public and governmental activities. In actuality, the royal teachers, priests, and ministers mentioned in Quotation 7, which is identical to the description in section 4 in Fig. 4, are attached to the king's palace as well. If we include them, the majority of the institutions listed in this square in Table 1 has a public nature.

(d) Outer square belt (6, 9, 12, and 15 in Fig. 4): Zone of private activities. As seen from Table 1, artisans and dealers of various kinds occupy the major portions in this belt. And we can also observe the differentiation of residential areas based on caste segregation. Each of the four sections is allocated to a particular caste: the north to Brāhman, the east to Kshatriya, the south to Śūdra, and the west to Vaiśya.

We find a similar concept of an ideal city in the section entitled "Kaogong ji" 「考工記」 in the *Zhouli* 『周礼』, the book on ideal political organizations in ancient China. It describes the formation principle of the ideal capital city and the spatial arrangement of various institutions including the king's palace. Fig. 5 shows a graphic representation of the ideal city described in the *Zhouli* (Tonami 1976, 306–11). It closely resembles the ancient Hindu ideal city reconstructed in Fig. 4. They have the following common characteristics:

1. *Urban form:* Square (or oblong) shape with four edges.
2. *City gate:* Twelve city gates in total or three gates in each edge.
3. *Street pattern:* Grid pattern formed by the intersection of two sets of three main streets running from east to west and from north to south.
4. *Subdivision of the city area:* Division into sixteen smaller squares.
5. *Zonal structure:* Arrangement of a central square and two or three surrounding square belts.

The main difference between them, on the other hand, lies in the allocation of institutions into the central square. In the ideal city of ancient India, the temple complex occupies this area. In the Chinese case, the central square is allocated to a palace-religious institution-government office complex. As to religious institutions, it has two shrines. One is a place for worship to the king's ancestors, which is located to the east. The other is a shrine for the spirits of the land, which is located to the west. It reflects differences in the concept of royal authority and the relationship between secular and religious authorities.

TABLE 1

ARRANGEMENT OF INSTITUTIONS IN THE IDEAL CITY ACCORDING TO THE *ARTHAŚĀSTRA*

Division	No.*	Institutions	Caste
Central Square	1	Temple	
Inner Square Belt	2	King's palace	
	3	Houses of all the four castes	
Middle Square Belt	4	Royal teachers; priests; ministers; sacrificial place; water reservoir	
	5	Royal kitchen; *elephant stables; storehouse*	
	7	*Treasury; Accountant's office;* various manufactures	
	8	*Storehouse of forest produce; arsenal*	
	10	*Stables for asses and camels;* working house	
	11	*Stables for conveyances and chariots*	
	13	Shops; *hospitals*	
	14	*Treasury; stables for cows and horses*	
Outer Square Belt	6	Merchants trading in scents, garlands, grains, and liquids; expert artisans	Kshatriya
	9	Superintendents of the city, of commerce, of manufactures, and of the army; merchants trading in cooked rice, liquor, and meat; prostitutes; musicians	Vaiśya
	12	Artisans manufacturing worsted threads, cotton threads, bamboo mats, skins, armour, weapons, and gloves	Śūdra
	15	Royal tutelary deity of the city; ironsmiths; artisans working on precious stones	Brāhman

*No. 1, 2, 3 . . . correspond to the numbers in large block form in Fig. 4.
Italics refers to institutions under the jurisdiction of government officials.
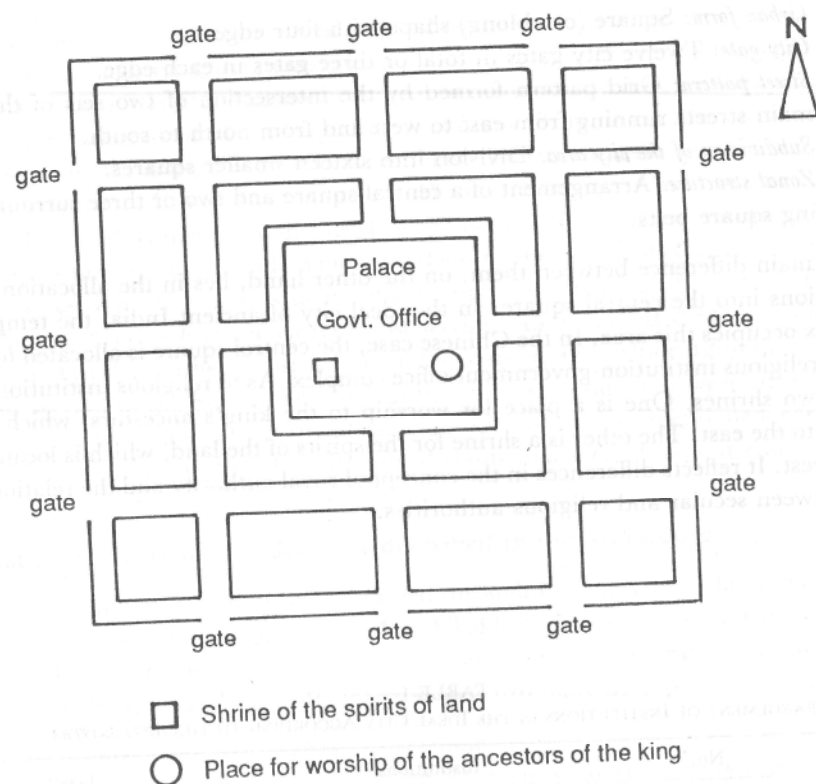
Fig. 5   Graphic representation of the ideal fortified capital in ancient China

□ Shrine of the spirits of land

○ Place for worship of the ancestors of the king

3   URBAN PLANNING IN JAIPUR

We have traced the tendency towards a "quasi-grid pattern" on the ancient Indian subcontinent by referring to the results of archaeological excavations and a certain classical source materials with items on urban planning. Our review is limited to the ancient period, for we cannot find a trace of grid pattern planning from the establishment of the Gupta dynasty in the fourth century A.D.

Since the rise of the Delhi Sultanate in the thirteenth century, Muslim influence was exerted upon urban planning in the Indian subcontinent, especially in the northern realm. We can find an urban form similar to the cities in the Muslim world beyond the Khyber Pass. A typical example is Tughlukābād constructed in the early fourteenth century by Ghiyāthu'd-Din Tughluq, the founder of the Tughluq dynasty. The city is located in the southeastern part of Delhi. It is surrounded by trapezium-shaped city walls which stretch over six kilometres in length. A strongly fortified palace-cum-citadel is located at the southwestern corner. Jāma Masjid (Friday Mosque) is situated to the northeast of the palace and occupies the central position of the civil zone. The main bazaar is estimated to have been situated along the wide street which runs northwards from the main gate of the palace. The spatial arrangement of the above institutions, palace-cum-citadel, Jāma Masjid, and main bazaar, is very similar to Shājahānābād (Old Delhi) constructed by the Mughal emperor Shājahān in the middle of the seventeenth century. The two cities have a common urban form which can be classified as "Indo-Islamic." However, we cannot find a grid pattern in the cities making up this group.

Then, did the grid pattern tradition just disappear from the end of ancient period on the Indian subcontinent? It is difficult to answer this question. However, we can present a good example of a grid pattern in eighteenth-century Hindu India; that is Jaipur, the capital city of the present Rajasthan State. Its construction was begun in 1727 by Jai Singh II. Under his general guidance, at least three Brahman specialists worked on the basic plan of the city. They were Vidyadhar Bhattacharya from Bengal, who worked on the overall design, Kewal Ram, an astrology expert, and Anand Ram, who engineered the construction of road and the water supply facilities (Nilsson 1987, 9).

Fig. 6 shows the plan of the walled part of Jaipur, which is the original city constructed by Jai Singh II and today called the Pink City due to the prevailing colour of the buildings. The city authority has instituted a regulation compelling the owners of all the buildings fronting main streets to paint the walls and facades pink. The regulation was put into effect to conserve the historical landscape and atmosphere of the city.

The grid pattern and general layout

From Fig. 6 we can observe a clear grid pattern street arrangement. This grid pattern is more notable in the southern part of the city, where the grid principle was applied to the arrangement of smaller roads as well. In the northern part the pattern is less noticeable due to the vast palace area located in the centre.

The main road, which runs in front of the palace from east to west, is called Rajapatha (King's Way). This road represents the east-west axis in the urban plan of Jaipur. It symbolizes the path of the daily movement of the sun from east to west and the purification of the city by sunshine. Rajapatha has two city gates at the two locations where it crosses the city wall. The two gates are named Sūrajpol (Sun Gate) in the east and Chāndpol (Moon Gate) in the west. The road has three square plazas, called *chaupar*, where it intersects the main streets running north-south. These crossroads have been named from east to west Rāmganj, Bari, and Chhoti. Each *chaupar* has a similar design. Fig. 7 shows the plan of Bari Chaupar. At the centre of crossroad, there is a small square pond and a larger surrounding square platform. On the opposite side of each corner of the square platform, there is a triangle pedestrian plaza where street stalls are set up. The outer limits of the pedestrian plaza are lined with one-storeyed shops. On a portion of their roofs, Hindu temples have been constructed. Therefore, *chaupar* are commercial and religious facilities as well as traffic sections.

The distance between the neighbouring *chaupar*s is about 800 metres. This length
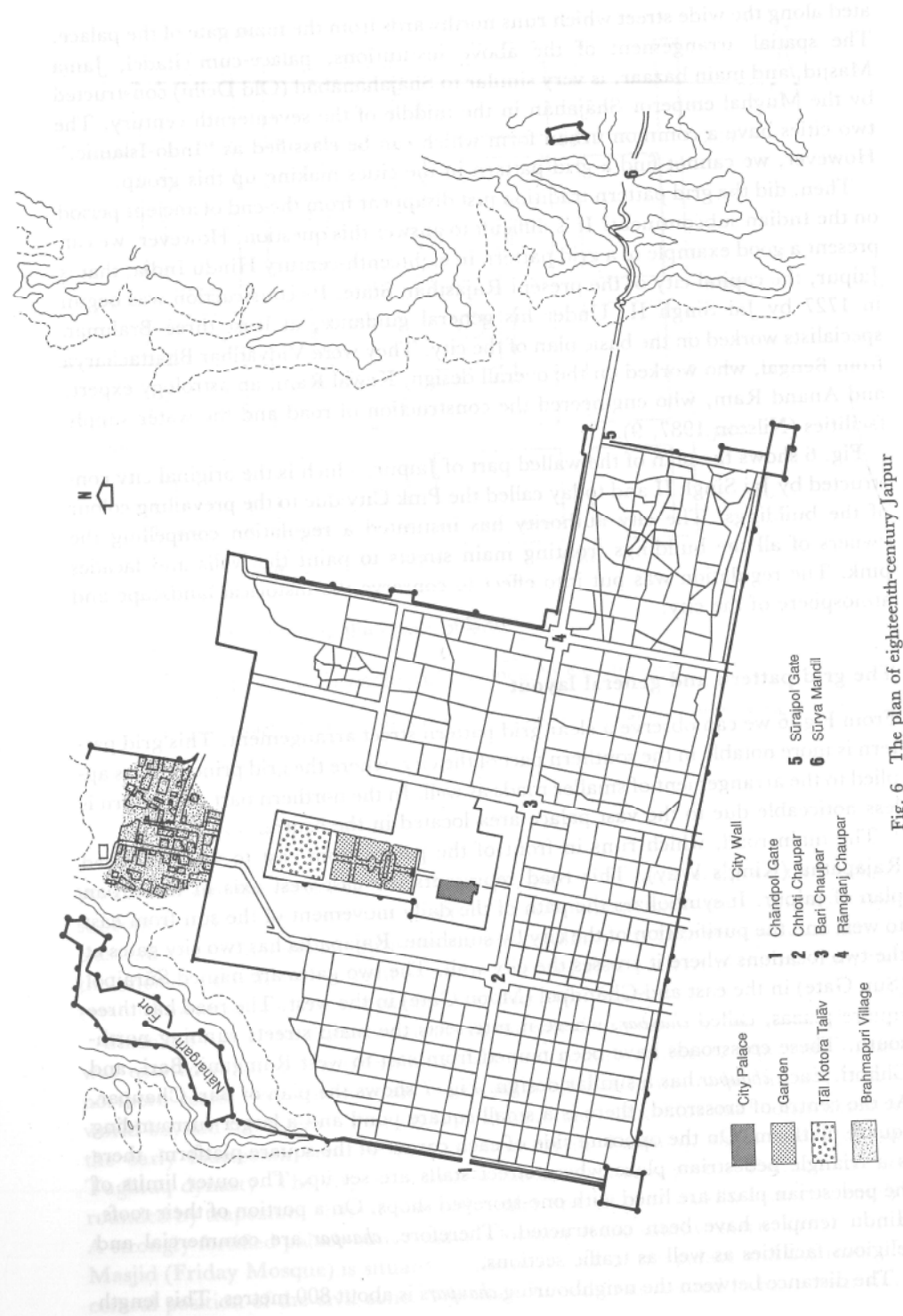
Fig. 6 The plan of eighteenth-century Jaipur

City Palace
Garden
Tāl Kotora Talāv
Brahmapuri Village

1 Chāndpol Gate
2 Chhoti Chaupar
3 Bari Chaupar
4 Rāmganj Chaupar
5 Sūrajpol Gate
6 Sūrya Mandi

City Wall

N

0   10   20   50   m

pond
temples (Hindu)
shrines (Hindu)
street stalls
carriage stands
drinking water stall

cloth, shawls, and sarees
bedcovers and towels
second-hand clothing
tailors
silversmiths
bangles

tea stalls and soft drinks
fried foods
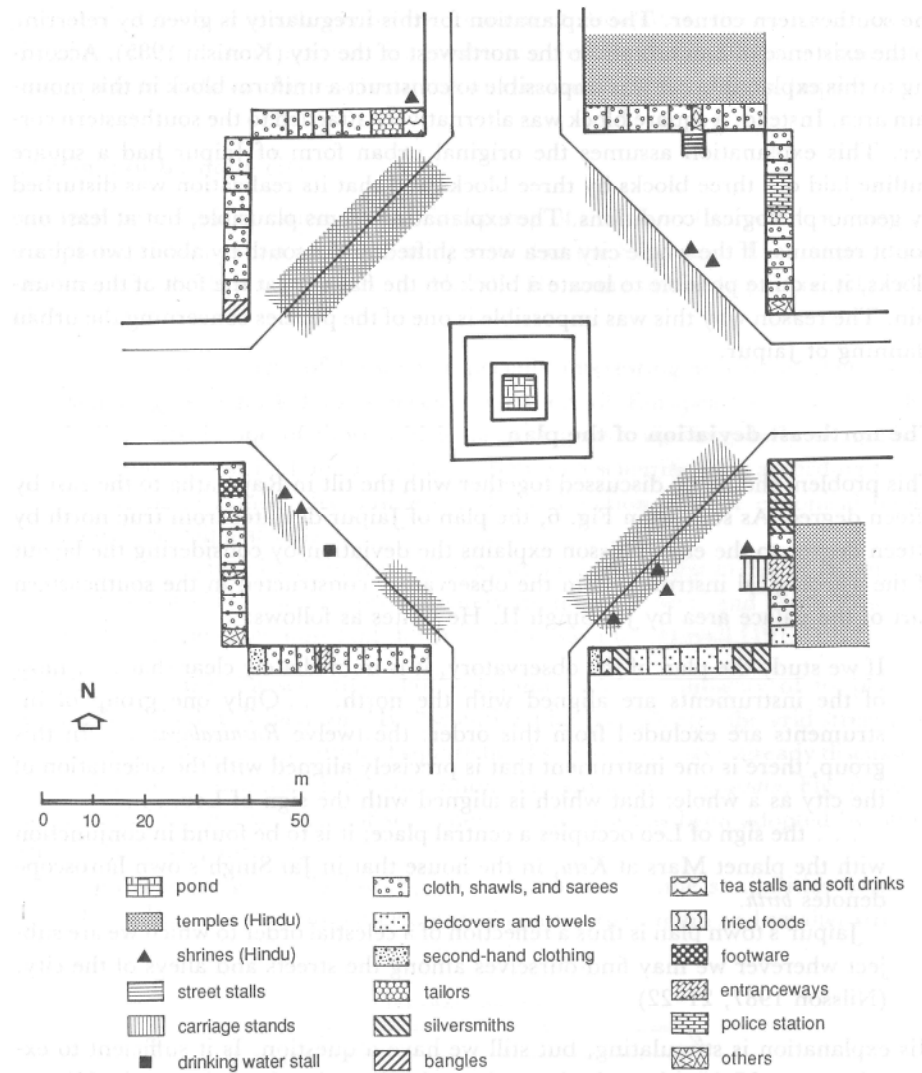footware
entranceways
police station
others

Fig. 7 The layout of Bari Chaupar

is a basic unit used in the planning of the city. From Fig. 6, we can easily see that the city plan is composed of square blocks divided by main streets. The distance between *chaupar*s is a basic unit for the division. Therefore, each block in the southern part is approximately 800 metres long on all sides except the one at the southeastern corner.

The city consists of nine different-sized blocks. As already explained the ideal city forms referred to in the ancient Hindu texts are mainly square or oblong. However, the outline of Jaipur is rather irregular due to a block projecting out from

the southeastern corner. The explanation for this irregularity is given by referring to the existence of a mountain to the northwest of the city (Konishi 1985). According to this explanation, it was impossible to construct a uniform block in this mountain area. Instead, a square block was alternatively attached to the southeastern corner. This explanation assumes the original urban form of Jaipur had a square outline laid out three blocks by three blocks and that its realization was disturbed by geomorphological conditions. The explanation seems plausible, but at least one doubt remains. If the whole city area were shifted to the south by about two square blocks, it is quite possible to locate a block on the flat area at the foot of the mountain. The reason why this was impossible is one of the puzzles concerning the urban planning of Jaipur.

The northeast deviation of the plan

This problem should be discussed together with the tilt in Rajapatha to the east by fifteen degree. As seen from Fig. 6, the plan of Jaipur deviates from true north by fifteen degree to the east. Nilsson explains the deviation by considering the layout of the astrological instruments in the observatory constructed in the southeastern part of the palace area by Jai Singh II. He writes as follows:

> If we study the plan of the observatory, it is immediately clear that . . . most of the instruments are aligned with the north. . . . Only one group of instruments are excluded from this order: the twelve *Rashivalayas*. . . . In this group, there is one instrument that is precisely aligned with the orientation of the city as a whole: that which is aligned with the sign of Leo. . . .
>
> . . . the sign of Leo occupies a central place; it is to be found in conjunction with the planet Mars at *Ketu*, in the house that in Jai Singh's own horoscope denotes *birth*.
>
> Jaipur's town plan is thus a reflection of a celestial order to which we are subject wherever we may find ourselves among the streets and alleys of the city. (Nilsson 1987, 21–22)

His explanation is stimulating, but still we have a question. Is it sufficient to explain the plan of Jaipur by referring only to the deviation from the north? His explanation does not say anything about the irregular outline of the city caused by the projecting block at the southeastern corner.

In order to discuss the quesiton, we refer to Fig. 6 again. The figure shows that the eastward extension line shoots at the Hindu temple situated on the saddle of the mountain in the east. The temple is named Sūrya Mandil (Sun Temple). From the saddle, we can look down upon the straight line of Rajapatha running through the city. Here Sūrya Mandil, Sūrajpol, Rajapatha, and Chāndpol form an axis, which could not be shifted southward. This is possibly the reason why the planners of Jaipur could not allocate a square block on the flat area at the foot of the mountain to the northwest of the city.

Therefore, it is possible to combine Nilsson's explanation on the deviation from

the north and our explanation on the location of Rajapatha, the east-west axis of the plan, in its present position. By combining the two explanations, we can get a reasonable foundation for resolving the puzzle found in the plan of Jaipur.

The Indian baroque city

Another significant question is the relationship of the plan of Jaipur as a whole to the Hindu idea of urban planning as described in the *Silpaśāstra*. The question was taken up for the first time by E. B. Havell. He wrote about Jaipur as follows in 1913.

> The plan of the city of Jaipur is especially interesting at a time when town-planning is regarded as a recent invention of European science, for this Indian city is one of those which has not grown up irregularly by gradual accretion: it was laid out at its foundation on a scientific plan according to the traditions of Hindu city builders and the direction of their canonical books called the Silpa-sâstras.
>
> The plan given by Râm Râz called *prastara* is very similar to that of Jaipur. . . . its main streets running approximately from east to west and north to south, following the directions laid down in Silpa-sâstras. (Havell [1913]1927, 224)

Havell emphasizes "a scientific plan" of Jaipur and a similarity of its plan to *prastara* described in *Silpaśāstra*. His "scientific plan" implicates the grid street pattern and systematic composition of square blocks, which we have already discussed. His important contribution is the indication of its similarity to *prastara*. Fig. 8 shows the layout of the *prastara* type of settlements. His idea has been adopted by other scholars such as Dutt (1925).

By comparing Fig. 6 and Fig. 8, we can point out some similarities between them. First, both have a grid pattern in the layout of their main and smaller streets.

The PRASTARA Plan
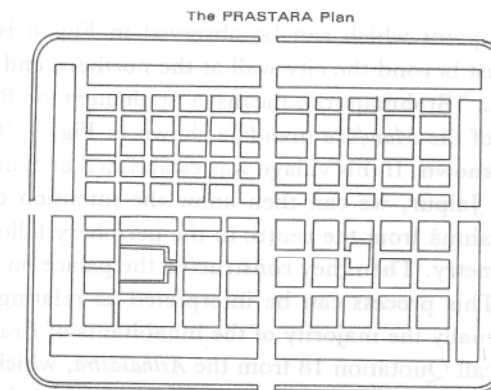
From Ram Raz, *Essay on the Architecture of the Hindus,*
London, 1834, Pl. XLV.

Fig. 8   The plan of *prastara* (Roy 1978)

Secondly, the grid pattern inside of each block is different from the others in size and shape.

Out of the eight settlement types depicted in *Mānasāra*, six have square or oblong outlines as a whole and clear internal grid patterns. Therefore, the former similarity is common among them. On the other hand, the latter characteristic is found only in *prastara*. In this sense, Havell's reference is reasonable. However, the layouts as a whole of Jaipur and *prastara* are quite different from each other. The main difference is in the presence of the north-south axis in the plan of Jaipur.

The north-south axis is easily identified in Fig. 6, that is, Chaura Rasta (Wide Road), which runs from the southern entrance (Tripoliya Gate) of the palace to New Gate at the city wall. In one of the old maps preserved at City Palace Museum, Jaipur, no north-south wide road is found between Bari Chaupar and Chhoti Chaupar. As the name "New Gate" suggests, Chaura Rasta was built later, and thus indicates that the original plan of Jaipur was changed in the process of its construction (Roy 1978, 39–40).

Now, what is the meaning of the addition of Chaura Rasta? We think its addition symbolizes the transmutation of Jaipur into a baroque city. The baroque style prevailed in Europe from the late sixteenth to the early eighteenth century. One of its urban planning features lies in the adoption of an axis of symmetry. In Fig. 6, we again take notice that the northward extension line of Chaura Rasta symmetrically divides the palace area, Govindji Temple, Mughal-style garden, and Tāl Kotora Talāv (Tank), into east and west. We can say that Chaura Rasta and its extension forms an axis of symmetry in the plan of Jaipur.

The ancient Hindu ideal city does not contain an idea of an axis of symmetry. All the roads running from east to west and from north to south have the same significance. It may be admitted that Jaipur was constructed as an Indian baroque city on the basis of the strengthening of royal power in the pre-modern era. The addition of Chaura Rasta to the plan of Jaipur symbolizes this process and suggests a fundamental characteristic of the city that was constructed by Māharāja Jai Singh II.

Another interesting point which can be observed in Fig. 6 is the location of Brahmapuri Village just beyond the city wall at the northern end of the extension line of Chaura Rasta. "Brahmapuri" means a settlement of Brahmā which is situated at the centre of the *Maṇḍūka* mandala shown in Fig. 3. The origin of the name of village is not known. If this village was established or renamed at the time of the construction of Jaipur, we can then know the intention of the builder in shifting the area of Brahmā from the centre to the periphery following the formation of an axis of symmetry. Then they constructed the palace on the original area of Brahmā, instead. This process can be interpreted as relating to the baroque features of Jaipur. Actually the majority of the inhabitants of Brahmapuri Village are Brāhmans. We recall Quotation 18 from the *Arthaśāstra*, which says Brāhmans shall reside to the north of the royal palace. The actual situation in Jaipur seems to follow this quotation. Here we have found one of the significant Hindu features of Jaipur city planning.

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