

Excavating the Nara Capital (1)

Ancient Cities in Japan

By Tanaka Migaku

1. Images of Cities in the East and West

Two distinct approaches are possible in the planning of cities. One is exemplified by the cities of Washington, D.C. in the U.S. and Canberra in Australia. The former was planned by French architect Pierre Charles L'Enfant, and the latter was based on a proposal that won a competition. Built from scratch on previously uninhabited land in the eighteenth century and twentieth century respectively, these capitals have as their principal feature streets that radiate out from the nuclei of parks and public buildings, such as The Capitol and White House in Washington, D.C. and Capital Hill and City Hall in Canberra. In Canberra, in particular, the streets are arranged in concentric circles with these nuclei as centers. Cities of such an image originated with ancient Greek and Roman cities that had *agora* and *fora* as nuclei. Cities based on this model or image were also considered ideal during the Renaissance.

The other approach to urban planning is common among cities in East Asia. When the imperial government of Japan began to colonize the previously sparsely inhabited island of Hokkaido in the late nineteenth century, the new cities that were planned were characterized by a grid arrangement of completely straight streets and avenues running north-south and east-west. No public buildings and parks functioned as nuclei for streets to radiate. The image of such cities, which was quite distinct from ancient Greek and Roman cities, was based on ancient Japanese cities, which were modeled after ancient Chinese cities.

Cities with a grid arrangement of urban streets and avenues were all originally modeled after Pingchang,



Reconstructed model of the Nara Capital (scale—1/1000)

the capital of the Northern Wei Dynasty (A.D. 386-534), located in present Dadong, Shanxi Province. Pingchang was the first Chinese city to adopt streets and avenues running north-south and east-west in a grid

arrangement. These streets and avenues were laid out outside the imperial residence and a complex of office buildings. This became the model of subsequent Chinese cities, and this was also the image of a city

which those who planned the Fujiwara capital of ancient Japan had in mind.

2. Fujiwara and Nara Capitals of Ancient Japan



The Fujiwara capital was the first Japanese capital to adopt the Chinese-style urban plan in 694. It was located in the southern Nara Basin in central Japan. Prior to Fujiwara, the capital had simply consisted of a

complex of imperial residential buildings and office buildings, as in the Asuka-Kiyomihara Palace: there were not fully-planned urban streets and avenues outside the palace. When the Fujiwara capital was built, the imperial government adopted a codified legal system and issued coins, thereby solidifying the administrative and economic foundations of the ancient Japanese state.

In 710 the capital of Japan moved to Nara, 20 kilometers north of Fujiwara. It was here that a sophisticated administrative and economic organization of central government was adopted, and it was well maintained. The Nara Capital marks the beginning of cities in Japanese history in a political, economic, and social sense.

Our understanding of the Nara Capital used to have to rely solely on historical records, such as the *Shoku-Nihongi* [Continued Chronicle of Japan] officially compiled by the imperial government in 797. Various administrative documents prepared in the eighth century still survive in the Shosoin Treasury, part of the Todaiji Buddhist temple. Some poems included in the *Man'yoshu* and *Kaifuso* also shed light on aspects of eighth-century society. Since 1959, however, archaeology has made a significant contribution to studies of the Nara Capital, owing to the discovery of a large number of wooden tablets with inscriptions. Archaeological research has considerably modified and enriched our picture of the Nara Capital.

3. Urban Plan of the Nara Capital

The Nara Capital was the center of Japanese government from 710 until 784, under the reigns of seven emperors and empresses. The relocation from Fujiwara had originated in 707 in the second month (lunar calendar); Empress Gemmei and other members of the ruling class felt it necessary to move in order to cope with the rapidly developing administrative and financial system of the imperial government. In the third month of the

same year, an official was appointed to oversee the construction work. In the ninth month the empress herself visited a potential site of the new capital, in the twelfth month the construction work started, and in the third month of 710 the capital of Japan officially moved to Nara.

The Nara Capital occupied the northern part of the Nara Basin. The capital subsequently moved to Nagaoka in southwestern Kyoto in 784, and all the area of the Nara Capital except for the Buddhist temple and Shinto shrine compounds became agricultural land. The layout of this agricultural land, however, still reflected the streets and avenues of the Nara Capital in the eighth century, which allowed scholars to reconstruct the urban plan of the Capital (Figure 1). As a result, the Nara Capital is known to have an approximately square area of 4.8 kilometers north-south and 4.2 kilometers east-west. An area known as the Outer Capital, 2.1 kilometers north-south by 1.6 kilometers east-west, was added to the eastern half of the Capital (Left Capital). To the north of the western half (Right Capital) was a projection 0.26 kilometers north-south and 1.6 kilometers east-west (known as the Northern Peripheral Ward). Altogether, the Nara Capital was 24 square kilometers in area.

The Nara Palace occupied the northern central part of the Nara Capital, an area of approximately one kilometer square, with a projection of 750 meters north-south by 250 meters east-west added to the eastern part. Altogether it covered an area of 1.3 square kilometers. The Palace consisted of the residence of the Emperor/Empress and family, buildings and spaces where ceremonies and political affairs were conducted, and offices where administrative work was carried out.

The construction of the Nara Capital started with dividing the construction site into a number of squares 530.5 meters long with a series of parallel lines running north-south and perpendicular east-west lines, resulting

in a grid arrangement. 530.5 meters was the equivalent of 1500 large *shaku*, a traditional unit of length. There were two different kinds of *shaku*. The large *shaku* measurement was applied to lengths on the ground, while the small *shaku* applied to other measurements. It was legally defined that one large *shaku* equaled 1.2 small *shaku*. The length of a small *shaku* in fact varied from 29.6 centimeters in the 710s to 29.8 centimeters in the 780s. This is apparent if one measures the spaces

between archaeological features of pillars from these decades. The large *shaku* adopted for the planning of the Nara Capital was approximately 35.5 centimeters.

The second step was the construction of major avenues on the lines dividing the 530.5 meter squares. The width of the major avenues varied. The widest was the Scarlet Phoenix Avenue, dividing the Right Capital and Left Capital. It was 210 large *shaku*, or 74.6 meters wide. The second widest was the Second Row

Avenue, marking the southern end of the Nara Palace, 105 large *shaku*, half as wide as the Scarlet Phoenix Avenue. The width of other major avenues was basically 80 large *shaku*. The Capital was divided into square wards by these major avenues. A series of wards on the Row Avenues were called *jo* or "rows," and wards on the Column Avenues running north-south were called *bo* or "columns." Rows were numbered from the north, and columns numbered from the Scarlet Phoenix

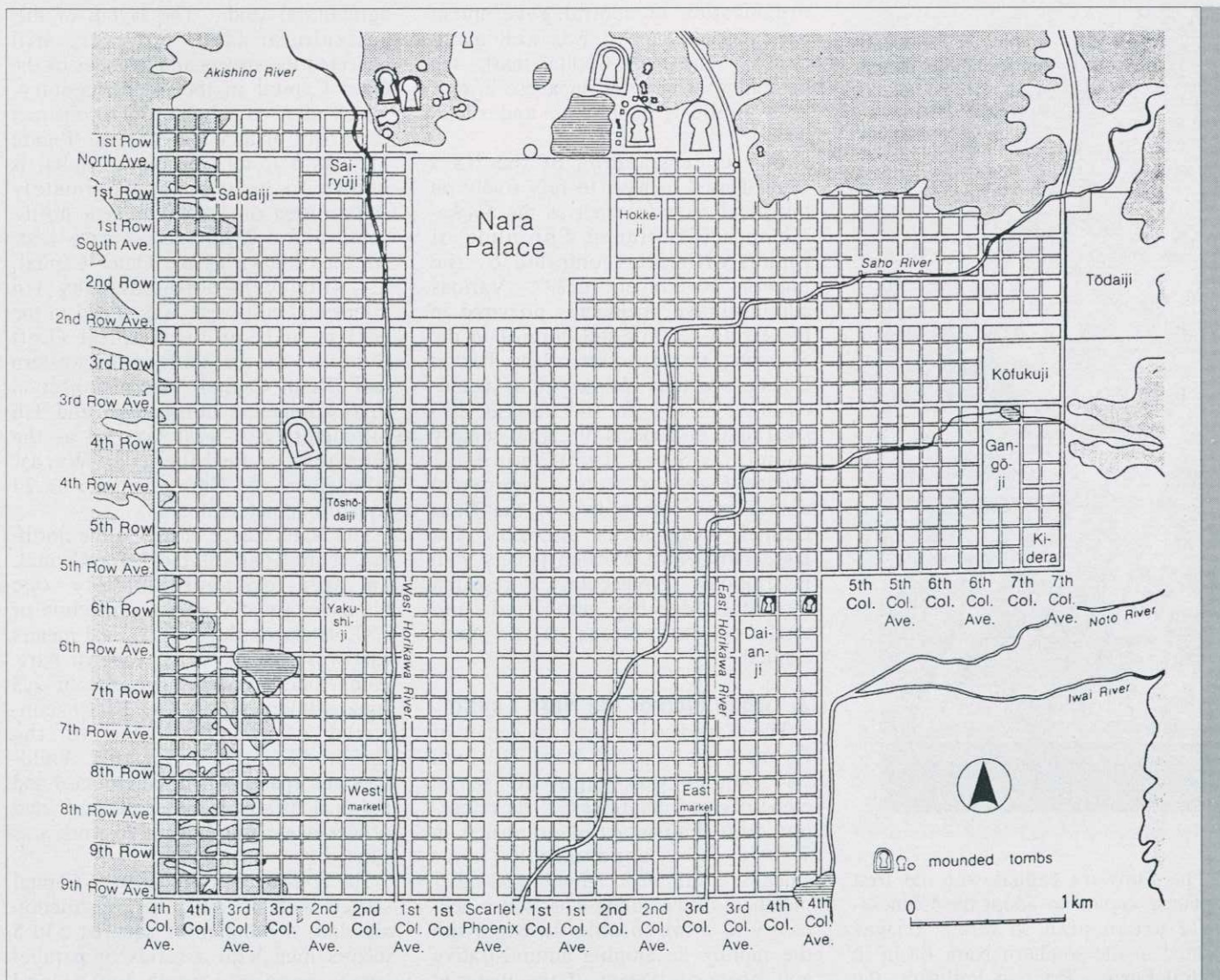


Figure 1: Plan of the Nara Capital



Figure 2: Bird's Eye View of the Nara Capital from the north; Nara Palace in front

Avenue to the east and west. A ward was designated by the numbers of the Row Avenue and Column Avenue intersecting at its southeastern corner in the Left Capital and southwestern corner in the Right Capital, for instance the Second Column, Third Row, Left Capital.

A ward was further divided into sixteen squares by three minor avenues (Column-Middle Avenue) running north-south and three minor avenues

running east-west. These squares were called *tsubo* or "blocks." These blocks were numbered from the corner of the ward that was closest to the Nara Palace (i.e. northwestern corner for wards in the Left Capital and northeastern corner in the Right Capital). A block was designed as, for example, Fifth Block, Second Column, Third Row, Left Capital.

This seemingly well-planned arrangement had an inherent

deficiency. Individual blocks were defined by the central lines of avenues regardless of their width. If a block faced a major avenue, the area of that block turned out to be smaller than blocks that were enclosed by four minor avenues. In other words, part of a block could be taken by the width of a major avenue. As a result, while the area of a large block (enclosed by four minor avenues) reached 16,000 square meters, the area of a block that

faced the wide Scarlet Phoenix Avenue was nearly one half of such a large block.

This problem of varying sizes of individual blocks must have been recognized. When the imperial government planned the city of Heian in Kyoto, which became the capital after 794, sixteen blocks of the same size were first laid out before major avenues were placed to enclose them. This method overcame the inherent problem in the Nara Capital.

The land within the Nara Capital was allotted to temples, aristocrats, and officers according to the number of blocks. For example, the state-supported Buddhist temples, Daianji and Yakushiji, which were moved from the Fujiwara Capital occupied fifteen blocks. The Kofukuji Buddhist temple, the clan temple of the highly influential Fujiwara family, occupied twenty blocks. Prince Nagaya, who was the prime minister in the 720s, lived in a mansion occupying four blocks. Fujiwara no Nakamaro, who held dictatorial authority in the 750s and 760s, was given land consisting of eight blocks. In contrast, middle to low class officials were allotted considerably smaller areas of land, such as one-eighth, one-sixteenth, or even one thirty-second of a block. One thirty-second of a block is roughly 500 square meters.

4. Construction of the Nara Capital

The construction of the Nara Capital started in 707, and Nara was declared the capital of Japan in 710. A mere two years and few months separates these two events. Did the construction of the Nara Capital of 24 square kilometers really take such a short time to complete?

A hint for the answer to this question comes from architectural and archaeological studies. In 1998, the Scarlet Phoenix Gate was reconstructed in a collaborative project of architecture and archaeology (Figure 3). This gate functioned as the main gate to the Nara Palace. It was 250 square



Figure 3: Scarlet Phoenix Gate of the Nara Palace (recently reconstructed)

meters in plan, 20 meters in height, and had adopted a two-layered roof. It took modern builders and carpenters four years and cost 3.6 billion yen (approximately 30 million U.S. dollars) to construct the gate. 1,000

cubic meters of timber and 42,000 roof tiles were used. Based on this experiment, it is possible to estimate that 300-thousand cubic meters of timber and five or six million roof tiles were necessary for the construction of



the Nara Palace, which was only one-twentieth of the Nara Capital in area.

300-thousand cubic meters of timber would produce more than one-million lumber of 10 *shaku* (3 meters) in length and one *shaku* (30 centimeters)

square. This allows the construction of approximately 30,000 ordinary Japanese houses.

It is historically known that most of the timber for the capital was obtained from Tanakamiyama hill, located to

the southeast of Lake Biwa (the largest lake in Japan). This resulted in the complete deforestation of Tanakamiyama, which is still recovering from it. The timber that was cut down was carried in floats on the Uji and Kizu Rivers a distance of nearly sixty kilometers to a port to the north of the Nara Basin. It was then transported overland for six kilometers.

Roof tiles were fired in kilns located in the hilly areas to the north of the Capital (Figure 4). The results of archaeological excavations suggest that at most ten kilns were in operation at once. Since one kiln can produce 3,000 roof tiles per month, the operation of ten kilns would result in a monthly output of 30,000 roof tiles. If this estimate is accurate, it would take twenty years to fire all the roof tiles necessary for the construction of the Nara Palace alone.

Apart from the procurement of materials, it was necessary to level the land to be occupied as the Nara Palace as its northern part was situated at the foot of a hill. A reconstruction of seventh century topography (before the construction) suggests that approximately 400-thousand square meters of hilly land had to be graded, and 800-thousand square meters of lower land had to be filled in order to level one square kilometer. Since the amount of earth resulting from grading hills was not sufficient to fill the lower land, an additional amount of earth was probably graded from hills to the north of the Capital. It is historically known that one worker carried 0.3 cubic meters of earth. Accordingly, it should take one-million work-days to carry all the necessary amount of earth. In addition, earth had to be hard pressed to solidify the ground. Ground had to be excavated. The amount of labor put into earthworks alone had to have been considerable.

The above estimates are applicable to the construction of the Nara Palace alone, which comprised a small part of the Nara Capital. A gargantuan amount of labor and materials must have been required to construct the



Figure 4: Roof tile kiln where roof tiles for the Nara Capital were fired (excavated in hilly areas to the north of the Nara Capital)

Even the main gate to the Palace may have been entirely transferred from the Fujiwara Palace. I speculate that the front of the Palace at its southern end had to be finished first in order to make its appearance "complete."

In connection with this archaeological evidence of recycling, roof tiles used in the Nara Palace have archaeologically been discovered in the Nagaoka Palace (784-794) and Heian Palace (after 794). Thus, whenever the capital moved, it appears that supra-structures and other materials were commonly dismantled and disassembled, transferred to the site of a new capital, and put to new use there.

5. Residents of the Nara Capital

It is possible to estimate the population of Japan and of the Nara Capital in the eighth century. By this time, all of the Honshu mainland except for its northeastern part, Shikoku and Kyushu were under the control of a central government. Japan was divided into 58 provinces, each of which was further divided into counties, and those counties into villages. It is historically known that 4041 villages existed. An estimate of the Japanese population may be obtained by the average population of a single village times 4041. The average population of a village can be calculated based on a few surviving records of taxation files and census registration kept in the Shosoin Treasury, which can be tested against other historic sources. By this calculation, the population of Japan in the early eighth century can be

Capital which had several temples and mansions. In fact, an imperial decree issued in the ninth month of 711 expresses regret that walls that were planned to enclose the Palace were not completed, owing to the utter exhaustion of laborers in the construction work.

Archaeological evidence substantiates the hypothesis that the construction work took an inordinately long time. As mentioned previously, large *shaku* was adopted for measuring length on the ground when the construction started. This practice was terminated in the second month of 713, thereby adopting the unit of small *shaku* for measuring length on the ground, such as the width of an avenue. Excavations revealed minor avenues that were 20 small *shaku* in width. This indicates that the construction of avenues in the Capital still

continued even after the second month of 713.

In order to expedite the construction, it is likely that materials used for the Fujiwara Palace were recycled for the Nara Palace. For example, an excavation at the southern end of the Palace, which we conducted in the mid-1960s, resulted in the discovery of roof tiles made with the same techniques and characterized by the same patterns as those of the Fujiwara Palace. Moreover, the positions of the base stones of the Nara Palace Scarlet Phoenix Gate were the same as those of the Fujiwara Palace counterpart. This indicates that the positions of pillars supporting the supra-structure of the gate were the same. Most of the materials such as wooden pillars and roof tiles that could be recycled were probably transported from the Fujiwara Palace.



estimated to have been four to five million. By the 780s, the population increased to 5.5 to six million.

The population of the Nara Capital is estimated to have been 100 thousand. It is known that the Fujiwara Capital comprised 1505 households, and this capital is thought to have been one-third of the Nara Capital in size. Assuming that the population density remained more or less the same from the Fujiwara Capital to the Nara Capital, the number of households in the Nara Capital would have been 4500. The average number of family members per household is 16.4 based on the taxation file of the Right Capital of Nara that survives in the Shosoin Treasury (Figure 5). 16.4 persons multiplied by 4500 households results in approximately 74-thousand people. In addition, there must have been a number of people, such as priests, who were not taxed or registered at each census. The figure of 100-thousand is therefore commonly accepted as an estimate for the population of the Nara Capital. At present, 120-thousand people reside in the area that was formerly the Nara Capital, so the population density at present is somewhat similar to that of the eighth century.

At the top of the residents of the Nara Capital was the Emperor or Empress who was supported by his/her family members and relatives as well as high-class aristocrats. In the ruling class were officials and bureaucrats who handled administrative paperwork. The life of aristocrats, bureaucrats and officials was supported by numerous servants and underservants. These all comprised the population of the Nara Capital. The total number of bureaucrats and officials in the central government was laid down as 6487. They were all given ranks. There were thirty ranks, and those who held the top fourteen ranks were relatives of the Emperor/Empress and those aristocrats eligible for high-class positions in the bureaucracy. There were only 100 such eligible people.

The difference in ranks was clearly reflected in the difference in salary. Taking into consideration the current price of rice and the amount of rice paid to aristocrats, those who held the highest rank annually received 380-million yen (approximately 3-million U.S. dollars); they were also allotted free of charge more than four blocks of land in the Capital for their residence. In contrast, officials who held the lowest rank annually received 2.3 million yen worth of cloth and ploughs in kind. Residential spaces allotted for the lowest-ranking officials were one thirty-second blocks.

Among the residents of the Nara

Capital, the identities of 116 people are so far known historically and archaeologically. Among them, the residences of those who held the top fourteen ranks were all located in the northern half of the Capital. Archaeologically, residential spaces occupying more than a block have been discovered only in the northern half. Mansions with gardens have likewise been found to have been only in the northern half. In the southern half of the Capital, residential spaces of less than half a block are common.

A single mansion contained a couple of large structures of 200 to 300 square meters in area, accompanied

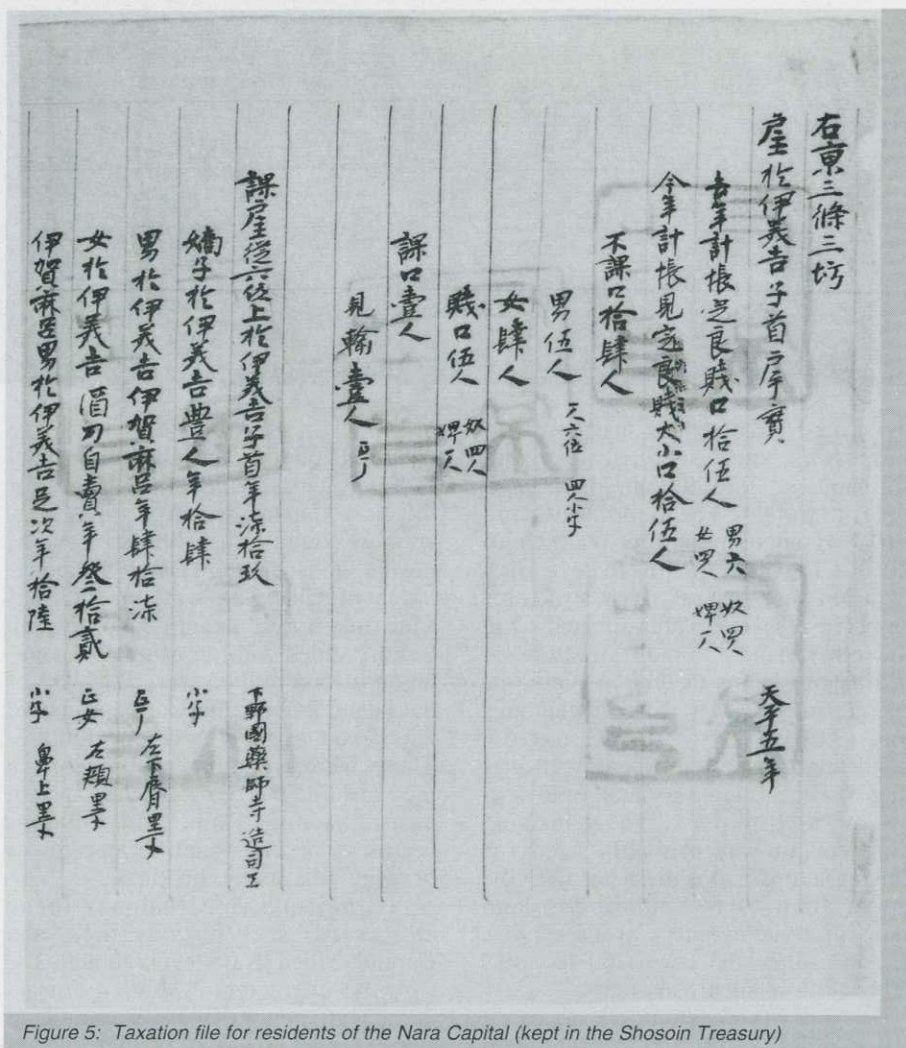


Figure 5: Taxation file for residents of the Nara Capital (kept in the Shosoin Treasury)



by several middle-sized structures and numerous smaller buildings and storehouses. In addition, there were several wells. The building-to-land ratio of such mansions was 10 to 20%. It was a major feature of a mansion that several large structures stood in a spacious area of land. On the other hand, a small structure of scores of square meters in plan was accompanied by a couple of buildings and storehouses in a narrow residential space. Only one well was dug. The building-to-land ratio was as low as 6 to 7%. The remaining empty land was probably used for raising crops. Needless to say, the upper limit of the building-to-land ratio in contemporary Japanese cities as defined by the law is 60 to 80%, 30 to 60% in suburban areas.

It is probable that 100-thousand peo-

ple lived in the Nara Capital in the eighth century. Chang'an, the capital of Tang Dynasty China, the model for the Nara Capital, was four times larger than Nara. The Chinese government's statistics shows that the population of Chang'an was one million. The only other examples of eighth century cities with an estimated population of one million were Baghdad of the Islam Empire and Constanti-nople, the capital of the Byzantine Empire. These were the three major cities in the world at that time. Other ancient cities, such as Rome and London, ceased to be cities and became towns or large villages by this time.

A final question that has to be addressed is: Why was the Nara Capital called Nara even though the Chinese characters 平城 used for its name can generally be pronounced *heizei* or *heijo*. It is historically

known that the area for the Nara Capital was already called Nara-yama or Nara Hill in the late seventh century, when a battle of the Jinshin Rebellion took place there. This indicates that the name Nara was adopted as the name of the new capital because it was located in the area called Nara. Nonetheless, the two Chinese characters can hardly be pronounced as Nara historically and at present. This remains an enigma. **JJI**

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