



A Digital Reconstruction of  
**Tang Chang'an**

Heng Chye Kiang

唐长安的数码重建

王才强

中国建筑工业出版社

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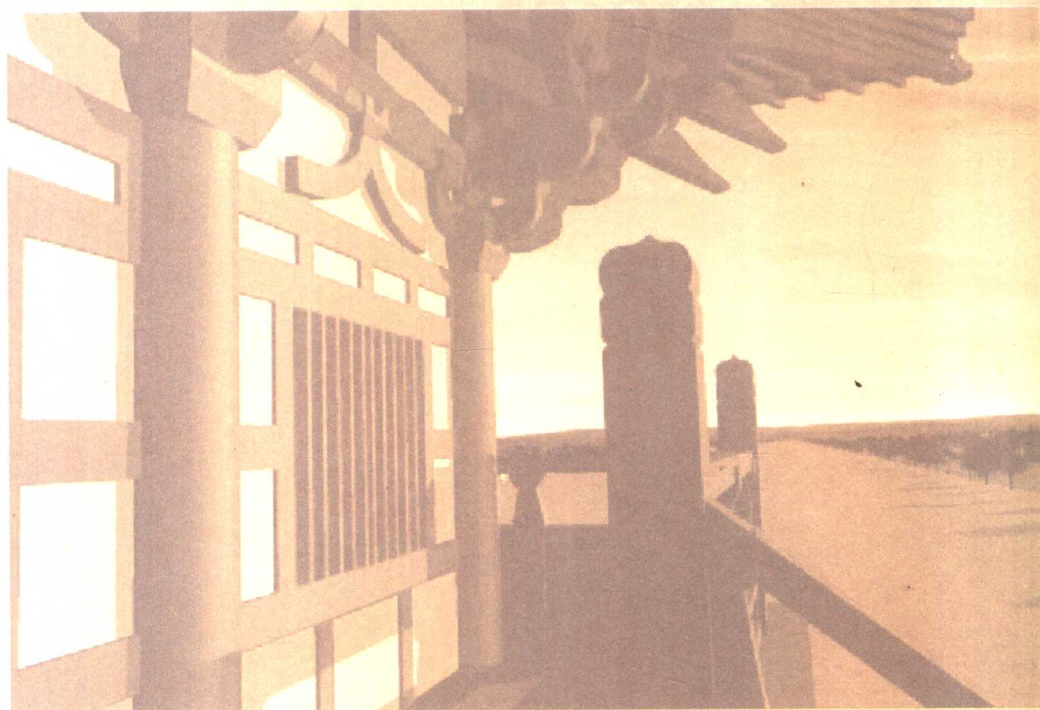


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图1: 明德门细部

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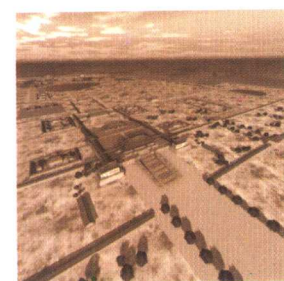
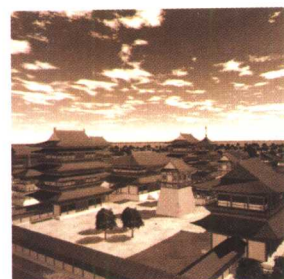
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## Preface

The need to write this book was not apparent to me at first. Part of the research leading to the digital reconstruction of Tang-period Chang'an was already published in an earlier book titled *Cities of Aristocrats and Bureaucrats*. However, the purpose of this earlier study was rather different. While the Tang capital was introduced, its main objective was to show the emergence of a new form of city brought about by a combination of different factors after the fall of Chang'an. This book attempts to examine Chang'an in greater depth and hopes to understand it sufficiently to reconstruct an "impression" of the capital at the height of its glory using digital media tools.

I say impression because it would be foolhardy at this juncture, or for that matter, at any other moment in time, to claim to be able to reconstruct the city. The ruins of the Tang capital lay some 1m to 3m below modern Xi'an, a bustling city of more than 3,950,000 inhabitants. Our understanding, derived from historical writings, maps, archaeological data, paintings of related contemporaneous buildings and scenes, etc., can only furnish us with a more or less developed impression of the Tang city. Even shortly after the Tang period, the once glorious capital of a vast empire was reduced to ashes and ruins — a victim of the numerous battles that devastated the capital towards the end of the 9<sup>th</sup> century and during the initial years of the Tenth. Hence, even half a century after the fall of the Tang dynasty, one would have little visual impression of the city at the zenith of its development.

However, given its colorful history, earlier efforts have been made by other scholars to provide visual impressions of the city. One such attempt to represent the city cartographically was made in 1080 by Lv Dafang. Fortunately for us, fragments of that subjective understanding of the city still survive today.

My own interests in reconstructing an impression of the Tang capital Chang'an was first supported by a two-year research grant from the National University of Singapore. Later on, the Asian Civilisations Museum of

## 序言

# 出

版这本书的想法并非始于我的初衷，

缘由本研究的一部分已经出版在拙著《贵族官僚城市》一书中。然而随着研究的深入发展，现在的研究目的已与早期研究有所不同。尽管当时研究也介绍了长安城，但其主要目的在于揭示唐长安没落之后，很多不同因素导致了一种新的城市形式的产生。本研究则更深入重点地研究唐长安，试图在充分理解唐长安结构的基础上，运用数码工具重现唐长安的旧日繁华景象。

这里我们所谓的重建只是为了营造一种景象。这是因为就目前来说，要声称能够复原某个特定时期的完整的唐长安城是不切实际的。唐长安的遗址静卧在如今的西安城——一个拥有395万常住人口的繁华都市的地下1m到3m处。我们对于长安城的理解，只能来自于历史著作、地图、考古资料、同时代对相关建筑和场景的绘画，这些资料多多少少帮助我们建立了一个唐长安的大致印象。这个庞大帝国的繁华首都在唐代灭亡后很快就灰飞烟灭，公元9世纪末和10世纪初的连年战火将长安城几乎夷为平地。因此即便是唐朝灭亡后不过半个世纪的人们也已经无从想像唐朝鼎盛时期歌舞升平的景象了。

鉴于唐朝浓墨重彩的辉煌历史，早期一些学者已经试图研究唐长安的视觉形象，他们的研究成果为我们提供了一些重要的线索。其中比较重要的一个研究是公元1080年的吕大防用绘图法来记录唐长安的景象。幸运的是这个对于长安城的重要主观纪录至今还保留了一些残片。

笔者本身对于重建唐长安的兴趣首先得到了新加坡国立大学的支持，给予两年的研究基金。之后，郭勳逊领导下的新加坡亚洲文明博物馆给予本研究其他两个阶段的经济支

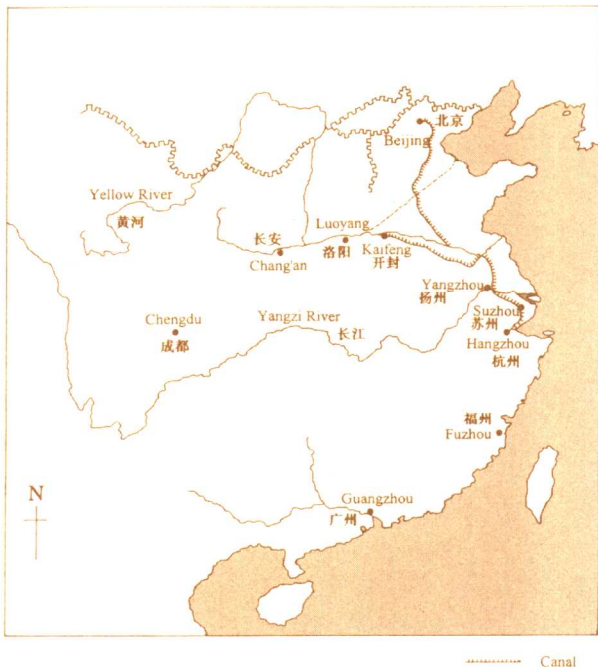


Figure 7: Location of Chang'an  
图7: 长安位置

Singapore (under Dr Kenson Kwok's direction) assisted to finance partially two other stages of work. Without such funding this work would not have been possible.

Throughout the process of reconstruction, many friends and senior scholars encouraged and spurred me on. First of all, I am grateful to Fu Xi'nian for his advice and comments throughout the years of my work; improvements done to the reconstruction are due largely to him. Wu Liangyong, Yang Hongxun, Tanaka Tan, Zhao Liying, Guo Daiheng, An Jiayao, Ho Puay Peng and the late Xu Bo'an and Shi Nianhai also gave constructive advice and expert opinion. To them all, I am thankful.

A project of this nature would not have been possible without the toil of the many student assistants who worked on the information collected. The list is long but in particular thanks must go to Leong Lai San, Eng Wang Kwoon, Law Teen Onn, Huang Yan, and Cai Hui, who assisted during the crucial moments of the project. Finally, Gan Ser Min, who had spent thousands of hours on the computer. She assisted in the project initially and collaborated in the later stages. Without her tireless efforts the project would still be in its infancy. This project is as much hers as it is mine.

Our cumulative endeavours can be found on the accompanying CD-ROM. I think you will agree with me after watching it that Tang Chang'an was truly a marvel of its time and a place that deserves more than one visit. I welcome students and scholars to add to what we have done and perhaps initiate further study. The place has fascinated scholars and poets over the millennium and will continue to fascinate us in the years to come even as we grapple to create, plan and live in our own unique cityscapes.

持。如果没有这些经济上的支持，我们的研究工作也就无从进行。

在重建唐长安的研究过程中，很多朋友和资深的研究学者都不断地鼓励和鞭策我。首先，我要向傅熹年先生表示我由衷的感谢，感谢他多年来一直关注我的工作，并且给予很多宝贵的意见和建议。复原研究中很多的改进都得益于他的帮助。另外我也要感谢吴良镛、杨鸿勋、田中淡、赵立源、郭黛姮、安家瑶、何培斌以及已故的徐伯安和史念海等。他们以专家的角度加以评点，给了我很多建设性意见。在此再次向他们表示由衷的谢意。

这样庞杂的项目也离不开很多学生助手的帮助。他们处理和输入了大量的数据。由于篇幅所限，无法在这里一一表示谢意。我在此特别向梁丽珊、翁婉君、罗定安、黄琰和蔡慧表示感谢，他们在该项目最紧要的关头作出了很多贡献。最后我也要感谢颜思敏，她自始至终用心地协助本研究工作，没有她孜孜不倦地在电脑前工作，这个工作可能就无法顺利完成。

我们多年来齐心协力的劳动成果集中体现在这张内附的光盘里面。我相信在看过光盘之后，你们也会赞成我的观点。唐长安的确是当时的一个奇迹，也是绝对值得人们一再探访的胜地。我欢迎所有的学生和学者对我们的研究提出宝贵意见，进行增补，也借以激发更深远的研究。一千多年以来，长安已经吸引了无数的学者和诗人，在未来的岁月里将继续吸引来自各种不同生活和工作背景的人们。



**CHAPTER 1: A BIT OF HISTORY**  
**— THE RISE AND FALL OF CHANG'AN**  
**第一章: 历史一瞥——长安的兴衰**

Figure 8 (left): Roof finial found at Daming Palace site  
图8(左): 长安城大明宫遗址上发现的鸱尾

## 1. A Bit of History — The Rise and Fall of Chang'an

### Introduction

**T**ang Chang'an (CE 618-906) was no ordinary capital city. Chang'an 长安 or the "City of Everlasting Peace" was perhaps the foremost city in the world during its time. At its peak the city had a population of about a million. It extended its influence to many Asian cities during that period. A number of 7th- and 8th-century Japanese cities and 5 capitals of Bohai (a thriving kingdom which existed from CE 698 to 926 in the northeastern part of today's China) were found to be modeled after it.

Chang'an was immense in size even by modern standards. It measured 9.72km by 8.65km, covering an area of some 84.1km<sup>2</sup>, and was larger than any other city ever built prior to the modern world. Rome, within its Aurelian Walls built in the late-3rd century, covered 13.7km<sup>2</sup>. Quite similarly, Constantinople, within its extended walls built around 447 by Theodosius II, had an area of only 12.1km<sup>2</sup>. Even the aggregate area of Baghdad of the 8th and 9th century — certainly the largest metropolis outside of China in the medieval world then — amounted to 30.2km<sup>2</sup> only, of which the walled city accounted for only 4.55km<sup>2</sup> or a mere 5.4% of Chang'an's size.

### A City From Scratch

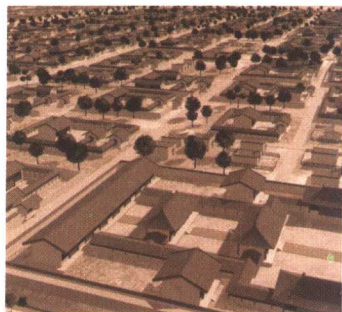
Chang'an was built from scratch by the short-lived but powerful Sui dynasty in 582. Just a year earlier, Emperor Sui Wendi 隋文帝 had usurped the throne after the untimely demise of a very capable Northern Zhou ruler who had in 577 united Northern China by conquering Northern Qi and set the stage for China's unification. Thirty-seven years later, in 618, with the founding of the Tang dynasty, it became the capital of perhaps the most

## (一) 历史一瞥 ——长安的兴衰

### 引言

**唐**长安(公元618-906年)是一个史无前例,非同寻常的城市。它可能是公元7世纪到8世纪时世界上最先进的城市。在其鼎盛时期,这座城市拥有100万人口,它对当时很多亚洲城市产生了深远的影响。例如公元7-8世纪的许多日本城市和渤海国(在公元698-926年曾经盛极一时的王国,位于如今中国的东北部)的五个都城都是以长安为原型建造的。

即使以现代的尺度来衡量,长安仍然是一个规模庞大的城市。它东西长9.721km,南北广8.652km,面积约84km<sup>2</sup>,比今天很多现代城市的面积还大。建于公元3世纪末的奥里利乌斯(Aurelian)城墙内的罗马城面积不过13.7km<sup>2</sup>;公元447年由谢尔多舍斯二世(Theodosius II)加建而成的君士坦丁堡也不过涵盖12.1km<sup>2</sup>。即便是8-9世纪中世纪中国以外最大的大都市巴格达,它的总面积也不过30.2km<sup>2</sup>,其中城墙内的都城面积只有4.55km<sup>2</sup>,约等于长安城尺度的5.4%而已。



Figures 9-11: Bird's eye view of  
Chang'an's Yongning  
Ward

图9-11: 长安城永宁坊鸟瞰平面



powerful empire then.

Construction of the city began in the 6th month of 582 with the building of the Palace City. While the construction of the palace took only 9 months and the emperor moved in during the spring of 583, the building of the capital city took much longer. Sui Wendi called this city Daxingcheng 大兴城 (Walled City of Daxing), after his own title, Duke Daxing.<sup>1</sup> It was to be a grand city from which the united China would be ruled.

The walls of the Palace City were erected first, followed by those of the Imperial City. A perimeter wall of rammed earth 36.7km in length was built around the capital. Today, the ruins of the bases of this wall measure between 9m and 12m. According to available records the height of the wall was 1.8 *zhang* 丈 or about 5.3m. This wall, due to its immense scale, took many years to complete. It was reinforced at least three times during the Sui and Tang dynasties: the first time in 613 when Sui Yangdi 隋炀帝 ordered 100,000 men to the task; the second time in 654 when Emperor Tang Gaozong 高宗 had 41,000 men work on it for a month; and finally in 730 during the reign of Xuanzong 玄宗 when construction went on for 90 days. During Gaozong's reign, when the city's outer walls were reinforced, the nine city gates along the South, East and West walls of the city were each crowned with a gate tower. Further protection was offered by a 9m-wide moat located 3m to 4m outside the walls.<sup>2</sup> This moat was later filled up after the middle of the Tang period.

The building and layout of a capital of this unprecedented magnitude was motivated by Sui Wendi's political vision of uniting China once again. It was to be the symbol of the entire Chinese realm and of his virtuous rule. Special attention was also paid to acts of symbolic and ritualistic importance to enhance the legitimacy of his reign.

When Emperor Taizu 太祖 later seized power during a popular uprising in 618 and established the Tang dynasty, he was content to continue the use of Daxingcheng as his imperial capital. He renamed it Chang'an, the City of Everlasting Peace. Little else was changed. The city was large enough to cater to the increasing urban population as well as to the needs of the expanding Tang Empire.<sup>3</sup> Except for the subsequent addition in 634 of another palatial complex, Daminggong, at the northeastern edge, the city remained within the bounds set by the city walls built during the Sui period. There was in fact little need to expand beyond the walls of the city as much of the southern sections remained sparsely inhabited throughout the Tang period, even though at its