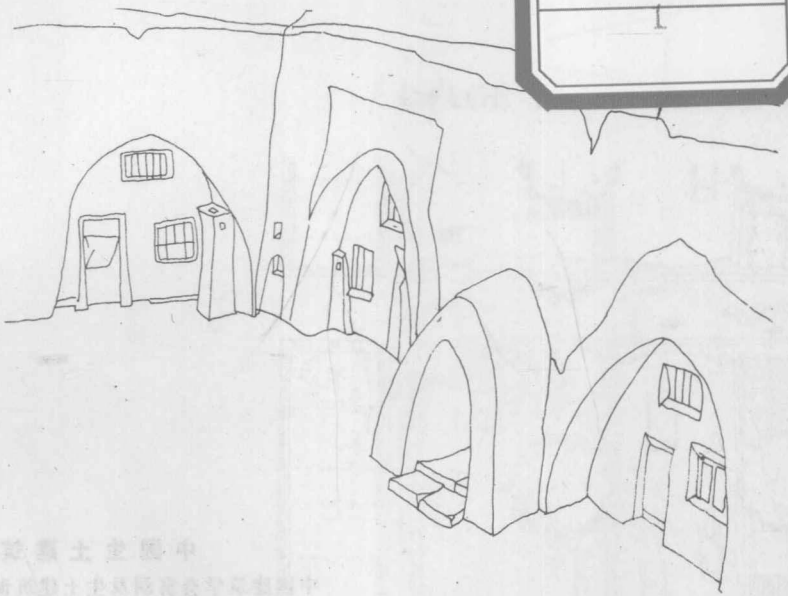
EARTH SHELTERED ARCHITECTURE IN CHINA

中国生土建筑



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中国生土建筑

中国建筑学会窑洞及生土建筑调研组
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前　言

从人类社会形成以来，“生土”一直是最主要的建筑材料。世界上有三分之一以上的人口居住在生土建筑之中。

近年来，在世界各地，众多的有关生土建筑的调研报告、论文、专著和优秀的生土建筑实例相继问世。传统的生土建筑对现代建筑潮流有什么启发和影响？生土建筑的提高与发展，将给人类的居住环境带来什么前景？这是人们关心的问题。

值此国际生土建筑学术讨论会议之际，谨向国内外学者、同行们奉献这本古朴无华的生土建筑图集，我为此深感欣慰。我衷心希望，这本小小图集，能引起专业工作者的关注，为我国生土建筑现代化而摸索经验，探求佳径。

任震英

1985年3月于北京

Preface

From the very beginning of the human race, “raw earth”was the main architectural material. One third of the population still today lives in earth dwellings.

Throughout the world, in resent years, many research reports, articles and books have been published on the topic of earth architecture. Also during this time, many new outstanding examples of earth shelter architecture have been built. Does the traditional earth architecture have any inspiration and influnce on modern architecture?With the development and the improvement of earth architecture, what will this mean to our future living environment?

I am gratified that this book could be presented to the collegues all over the world during the seminar of international earth architecture. I hope indeed that it will attract the attention of reserchers of speciality. And I also hope it will lead to further research to improvments in the modernizition of the earth building in China.

序

生土建筑是一种最古老而迄今还一直被广泛采用着的建筑类型。近年来，它又成为世界所关注的一个课题。

中国的生土建筑是我国劳动人民因地制宜，经过长期实践积累了丰富经验的一种历史悠久、形式多样而面广量大的建筑类型。它具有就地取材、造价低廉、技术简便、节省能源等明显的优越性。当然，它也存在着抗震性弱，耐久性差和比较简陋等缺点。

希望这本册子能促使大家更加重视“生土建筑”，并推动对它的研究和改进工作。使我国古老的“生土建筑”焕发青春。

金瓯卜

1985年3月于北京

Preface

Earth building is an old but up to now widely used type of architecture. In recent years it has been a topic which much attention has been paid to all over the world.

Chinese earth architecture with its long history has found a variety of suitable solutions to the local conditions throught the experiences accumulated by the laboring people of our country. Earth architecture has the remarkable advantages some of which are the use of local materials, inexpensive building costs, ease of construction, energy efficient, etc. Of course it also has disadvantages some of which are poor seismic performce, lack of complete durablity and genaral simplicity.

The publisher of this book would like to bring everyones attention to earth architecture and also to promote its modernization in revitilizing the ancient earth architecture of China.

编者的话

当前全世界都在探讨节能建筑以及建筑如何保护和利用自然环境，"冬暖夏凉"的黄土窑洞和生土材料的房屋，引起了国际建筑界的注意。中国的传统生土建筑反映了中国广大黄土地区的风土民情和环境特色，在中华民族的发展史上，古代、近代和现代都起过重要作用。生土建筑是勤劳智慧的劳动人民认识自然、利用自然、改造自然的杰作，是名副其实的节能建筑。

《中国生土建筑》图册是由中国建筑学会生土窑洞调研组和天津大学建筑系共同编写的，其中大部分图片均由调研组提供的。限于编写水平，这本图册尚不能全面描述中国传统生土建筑的概貌。使长期以来在中国作为贫困象征的"寒窑土屋"变为一种现代化的文明建筑，这是当代建筑师的光荣职责。编写中，得到建筑学会黄新范、任致远同志的支持帮助，在此表示感谢，并对天津大学黄为隽、魏挹澧、刘小宜、史唤玲、费麒麟诸同志顺致谢意。

编者　荆其敏　兰　剑　宋海亮

1985年2月于天津

FOREWORD

Energy saving architecture and architecture which takes advantage of the natural environment is being studied all over the would. Cave houses which are cool in the summer and warm in the winter, and houses made of earth material are being paid much attention to by international architecture circles. Traditional chinese earth building represent the local conditions customs and environment characteristics of the vast loess regions. In the history of China, earth buildings played an important part in ancient and contemporary times. Earth building is the remarkable work of the industrious and ingenious Chinese people in understanding and taking advatage of the natural world. They are the best energy saving buildings in the world.

"Earth Shelted Architecture in China" is compiled by the earth building reserch group of China Architecture Society and the Architecture Department of Tianjin University Most of the photographs were offered by the reserch group. This book gives only a general picture of traditional Chinese earth shelted architecture. We hope that the "earth cave" which is a mark of the poor in the history of China will endure and become a part of modernized architecture. It is a task of contemporary architects to pursue its improvement.

We wish to acknowlege the following people for their valuable contributions to this work : Huang Xinfan, Ren Zhiyuan, from China architecture society. Huang Weijun, Wei Yili, Liu Xiaoyi, Shi Huanling, Ant hony Vacchione from Tianjin University.

author : Jing Qimin. Lan Jian. Song Hailiang.

February. 1985.

目 录 CONTENTS

目 录 CONTENTS

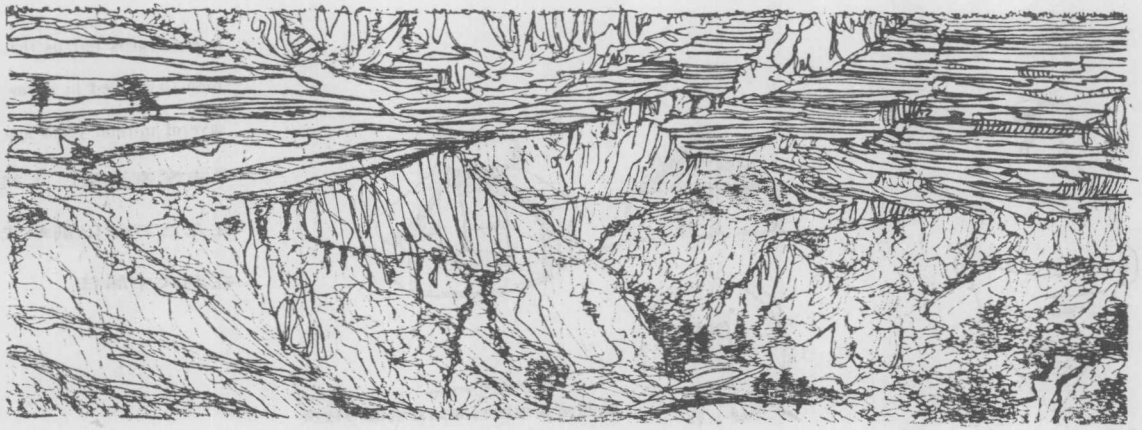
1 生土建筑的起源
ORIGINS OF EARTH BUILDINGS

生土建筑技术和未经焙烧的原土是人类最古老的建筑技术和材料，犹如石器是人类最古老的工具一样。生土建筑至今仍广泛用于中国广大的黄土地区。中国的考古发现，人类祖先最初采用穴居的形式。由于有上千年对土的特性了解，使人类由天然的石洞迁入土穴居住。1954年开发了大约6000年前靠近西安的半坡村原始部落遗址。4000年前人们为了防御，发展了夯土技术，最有名的是夯土筑造的城墙。进而有了人工制品烧制的坯砖以增加墙的强度。

现代节能与环境设计的重要性使地下建筑受到建筑师和规划设计师们的关注，近年来中国传统的生土建筑更引起人们广泛的研究兴趣。

Soil building technology is of very ancient origin and is still widely used in the vast loess regions of China. Here the unbaked clay, adopted as building material is as ancient as paleolithic tools. Archological finds in China have clearly shown how our ancestors who after living for thousands of years in natural rock cave dwellings emerged to live in earth carved dwellings, in the process they acquired knowledge about the characteristics of different soils. Since 1954 five excavations made at the 6000 year old Ban Po village near XiAn have brought to light interesting features of primitive society. About 4000 years ago the technique of rammed earth construction was developed for building defense ramparts. The best example of this type of construction is probably the famous Great Wall. Stone masonry and kilnburnt bricks were added during later dynasties for further strength.

With the emphasis today on energy conservation and environmental design, subterranean architecture has drawn much attention from architects and planners who have already begun to study traditional Chinese earth building technology.



上图　黄土高原
ABOVE: LOESS PLATEAU

下图　西藏高原
BELOW: PLATEAU OF TIBET

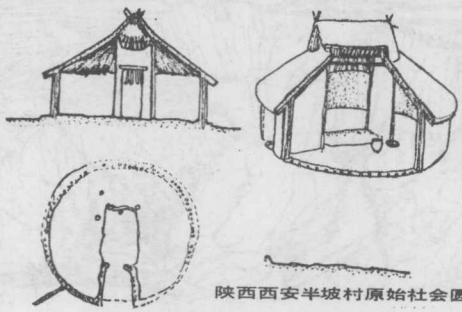
六千年前的半坡村
BANPO VILLAGE 6000 YEARS AGO

Archeologists tell us that man first lived in caves several million years ago

考古学家证实，人类在几百万年以前最先在洞穴中居住

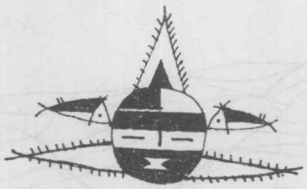
吸水瓶

An amphora



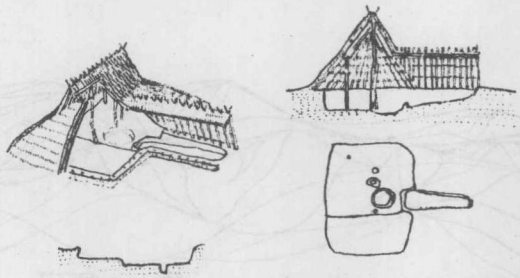
陕西西安半坡村原始社会圆形住房

Ancient dwellings in Banpo, Xian. Circle plan



人面鱼身图

Painted with fish and human face design



陕西西安半坡村原始社会方形住房

Ancient dwellings in Banpo, Xian. Square plan

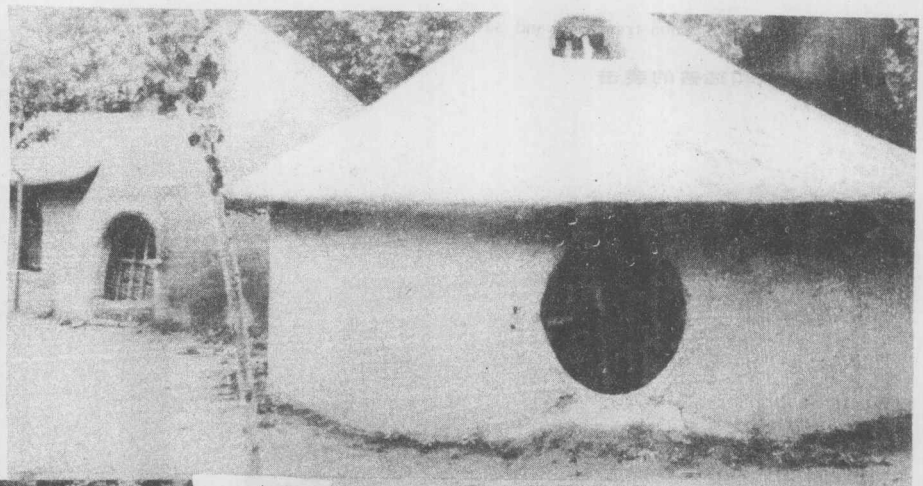
西安半坡村原始公社

ANCIENT VILLAGE IN BANPO, XIAN.

半　坡　村
BANPO VILLAGE

The history of "earth sheltered architecture" is as old as the human race.

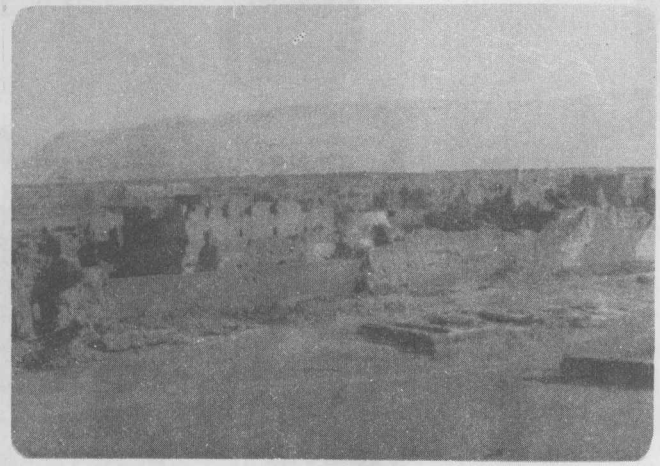
"生土建筑"的历史和人类的历史一样久远

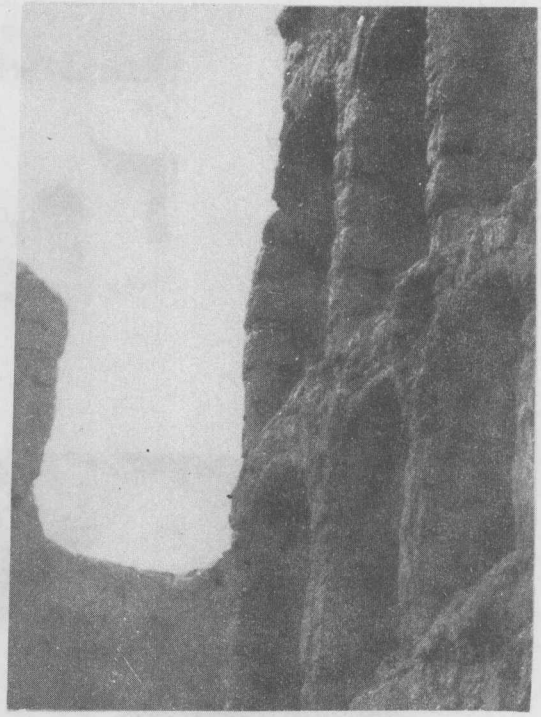


高 昌 古 城
ANCIENT CITY OF GAOCHONG

The wall serves as protection from war and savage attack

古代避免战争和猛兽的袭击

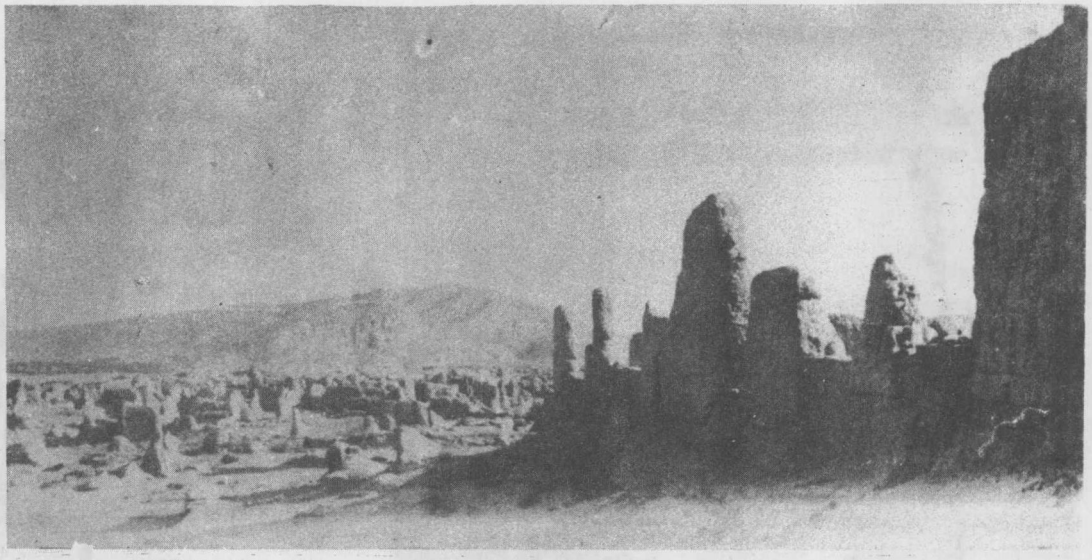


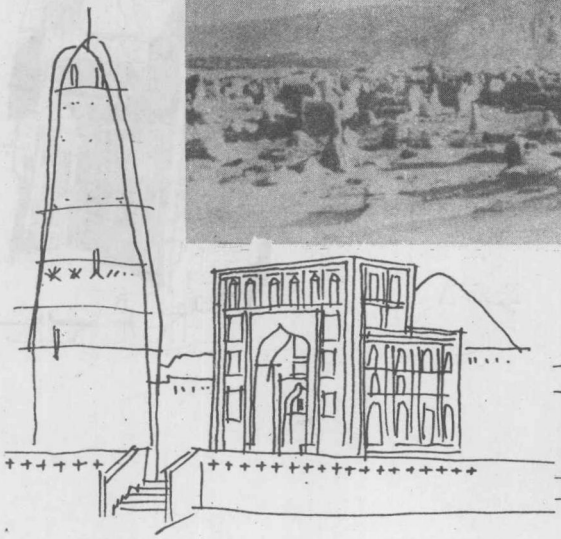


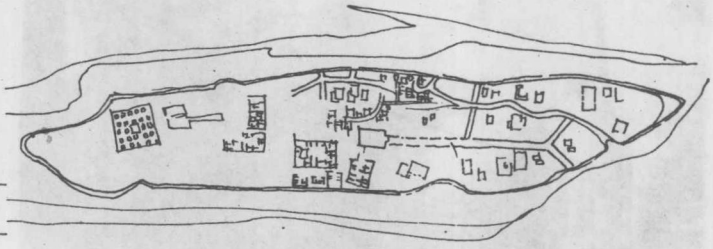
1500年前丝绸之路上的高昌古城

THE CITY OF GAOCHANG WHICH IS ON THE SILK ROAD 1500 YEARS AGO.

吐鲁番苏公塔
AMIN MOSQUE TURFAN

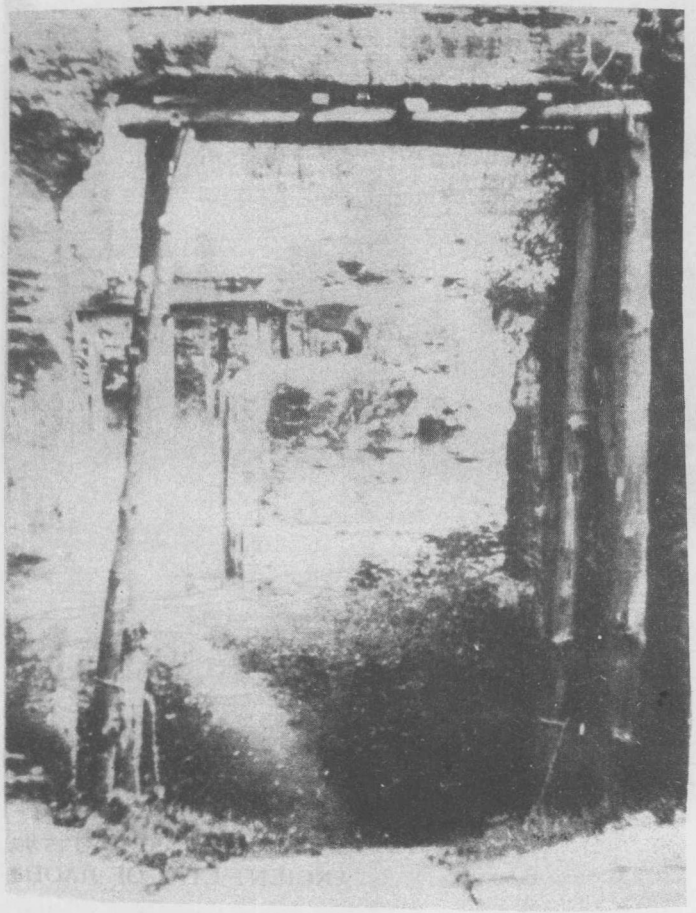


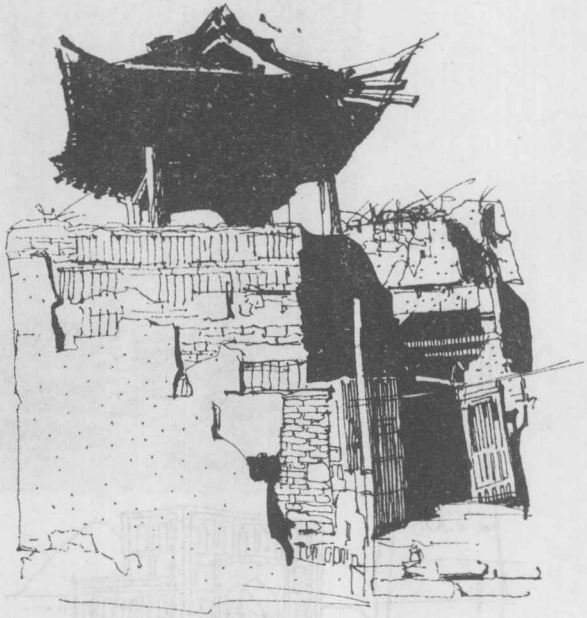




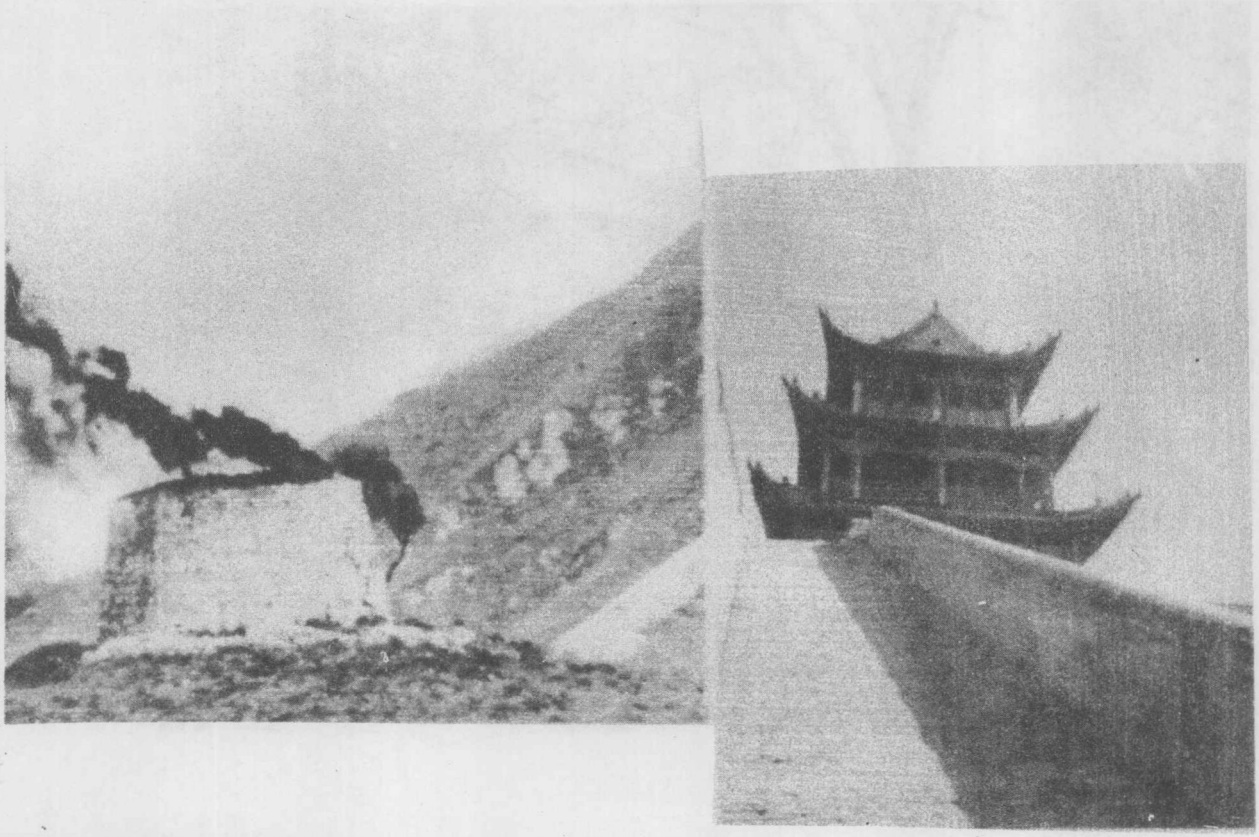
交河古城
ANCIENT CITY OF JIAOHE

镇江焦山清代炮台遗址
RUINS OF BATTERY QING DYNASTY, ZHEN JIANG





钟　　楼
BELL TOWER



长城　嘉峪关　烽火台
GREAT WALL　JIAYUGUAN GATE　BEACON TOWER

寓于大自然中
HARMONY WITH NATURE

延安中组部办公室
OFFICE BUILDING IN YANAN