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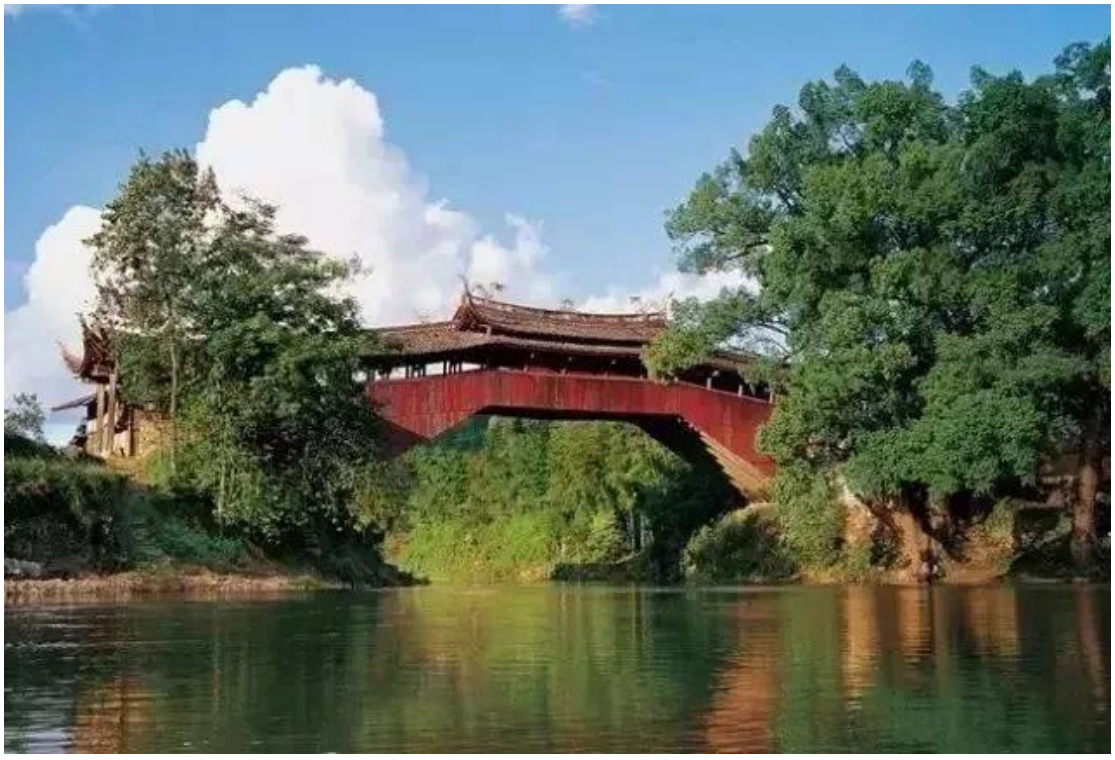

第九期

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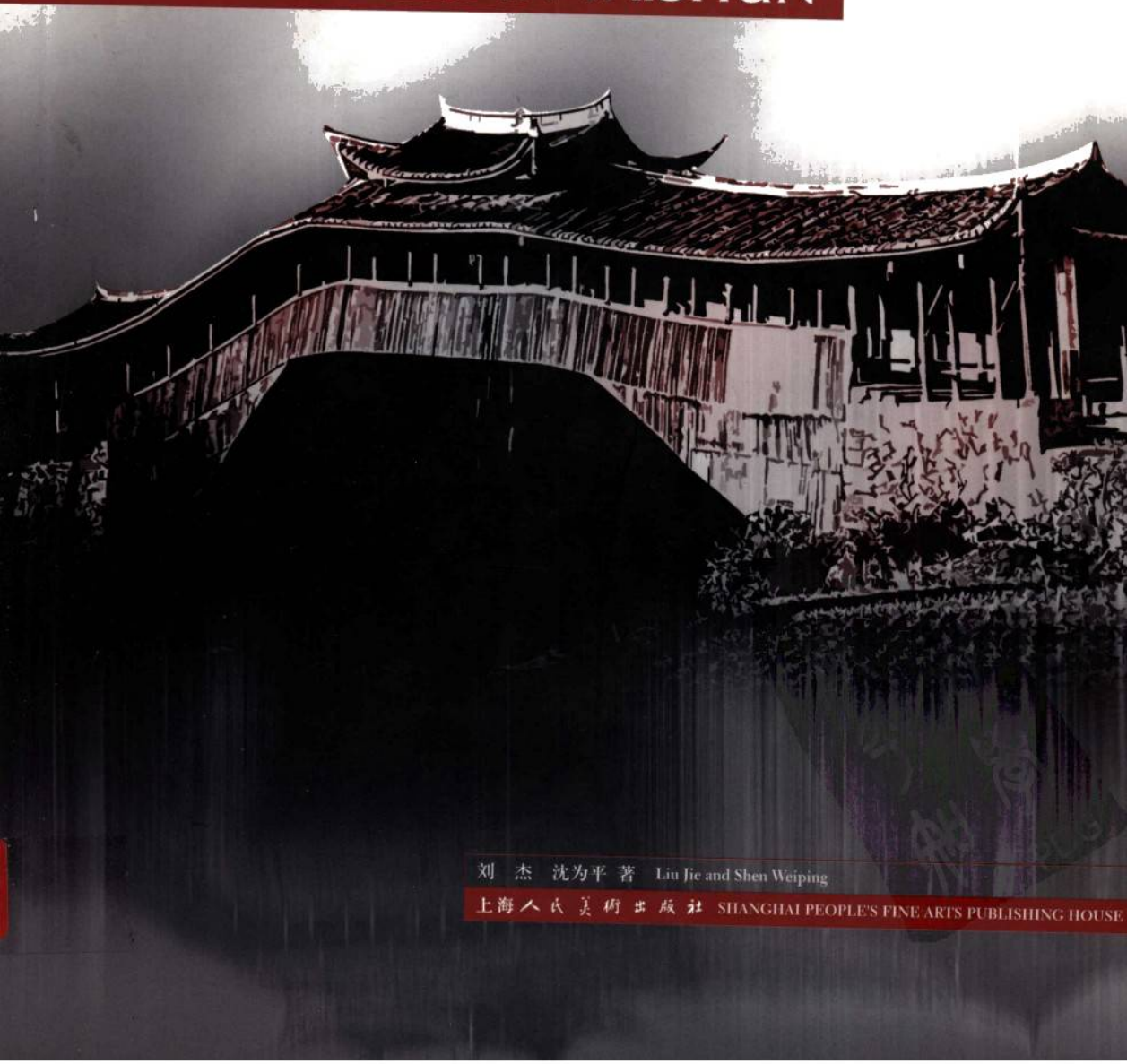
泰順廊橋

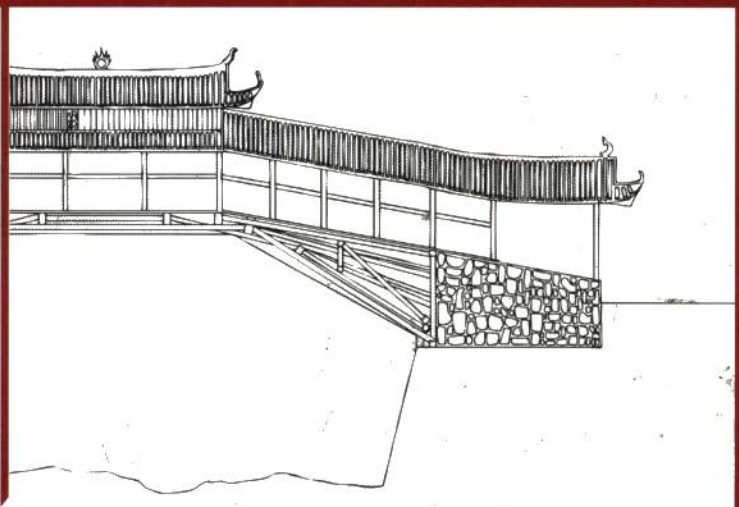
LOUNGE BRIDGES IN TAISHUN



刘 杰 沈为平 著 Liu Jie and Shen Weiping

上海人民美術出版社 SHANGHAI PEOPLE'S FINE ARTS PUBLISHING HOUSE

泰顺廊桥



◉泰顺是位于浙江省南部的一个山区县。泰顺的廊桥，由于其历史之悠久，技艺之精湛，使它在中国桥梁史上占据着重要地位。只是泰顺山高路远，交通闭塞，具有重要工程技术价值、建筑艺术价值的各式木廊桥，至今还不为多数人所认识。

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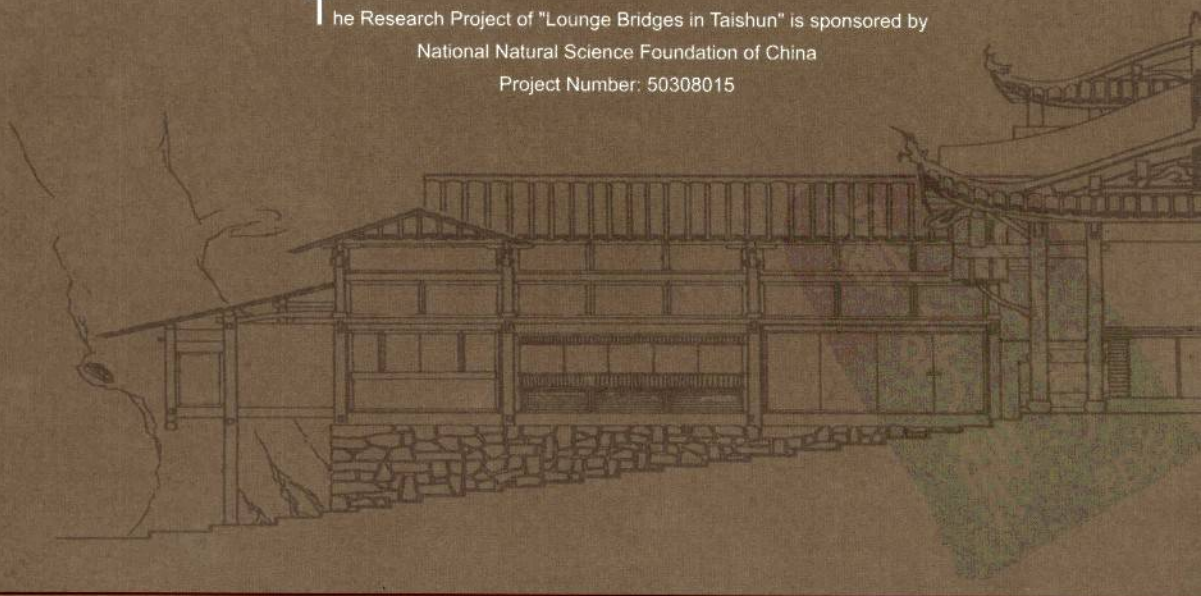


序

人们鉴赏非常写实的宋人名画《清明上河图》时，总是被其中的虹桥所吸引；对于行家来说，更是痴迷于它精巧的木结构。20世纪60年代，我看到甘肃遗存的类似木桥实物，具体而微地展现了千余年前的汴梁虹桥风貌，令人不胜惊喜。半个世纪之后，当我得知浙江泰顺至今犹存不少此类木桥时，更是大喜过望，双手加额，庆幸祖国的这一文化遗产没有失传。

个人孤陋寡闻，是鄙门生上海交通大学建筑学系刘杰副教授见告，才使我了解到这些先人杰作的遗存。刘杰是一位精明干练的青年学者，他尤其具备开拓精神。泰顺廊桥课题的选定和披荆斩棘的调查研究，弥补了北宋汴梁虹桥和泰顺廊桥这一领域研究的空白，就是一个证明。他正在进行的博士研究生课题——《南方地区古代木构建筑的发展》，是他进一步钻研、开辟的另一建筑史上的新领域。刘杰养成治学严谨的良好学风，在科研中认真求实，关于北宋汴梁虹桥和浙闽木拱桥的名称定位就是一例。本来唐寰澄先生在所著《中国古桥技术史》中，将北宋汴梁虹桥一类命名“叠梁木拱桥”，后来他在《中国科学技术史·桥梁卷》更名为“贯木拱桥”。刘杰对此一直怀有疑问，一次征询我的意见时，我不揣冒昧地提出拙见，认为这种结构、构造并非东汉画像砖、石上所见木桥之“叠梁”做法，而“贯木”也不够确切；准确地说，这种木拱是编起来的——其构造特点是在一排木纵梁之间用若干横梁编织。起初，我强调其形成编织的受力如梁的横木这一特点，而名之曰“编梁木拱桥”。中国力学学会副理事长、结构专家沈为平教授很认同这个“编”字，他从结构整体着眼，区别北宋汴梁虹桥和现存浙闽虹桥，与刘杰一起分别命名前者为“编木拱桥”，后者为“编木拱梁桥”，我很赞成他们的这一命名。在刘杰进行虹桥研究的过程中，沈教授不但给予了大力的支持和指导，确定了此类桥梁的名称，而且进一步参与了他的研究课题，使虹桥研究更上一层楼。《泰顺廊桥》就是他们合作的结晶，嘱我作序，不胜荣幸。

刘杰他们进行的泰顺廊桥研究还有一大特点，那就是比较注意多学科的协作。刘杰和沈为平教授的合作本身就是建筑学与结构学两大学科的结合。此外，他们还与复旦大学历史地理研究所的教授们合作，与当地的文博专家合作，所用方法已经早已超出建筑学的

Preface

One may be fascinated by the rainbow bridges in the famous Chinese painting of the realistic style titled "*Festival of Pure Brightness on the River*" produced in the Song Dynasty, but experts are more interested in the exquisite wooden structures of the bridge. I went to Gansu Province in the 1960s and saw with my own eyes the similar wooden bridges, which surprisingly represent the bridge styles of the Song Dynasty. Now half a century has passed, and when I learned that quite a few wooden bridges still exist in Taishun of Zhejiang Province, I was nevertheless surprised and felt happy about the fact that this heritage has not been lost as one of the Chinese cultural relics.

It is Mr. Liu Jie, one of my students and associate professor of the Architecture Department in Shanghai Jiaotong University, who told me of the existence of these bridges handed down from many generations. Mr. Liu is a young and energetic scholar. His groundbreaking investigation of the subject of Lounge Bridges in Taishun opens a new area in the academic field of Bianhe Rainbow Bridge in the Northern Song Dynasty and Taishun's Lounge Bridge. His doctoral subject is the "*Development of Ancient Wooden Construction in the South of China*", which is another new field in the Chinese Architectural history. Mr. Liu has a stringent academic style, as demonstrated in the denomination of Bianhe Rainbow Bridge of the Northern Song Dynasty and Zhejiang-Fujian Timber Arch Bridge. Bianhe Rainbow Bridge of the Northern Dynasty used to be denominated as "Combined Beam-Arch Bridge" in the *Chinese History of Ancient Bridge Technology* by Mr. Tang Huancheng, and later changed to "Interlocked Timber Arch Bridge" in the "Bridge" Section of the *Chinese History of Science and Technology*. Mr. Liu has doubted it and asked me for my opinion. I ventured to raise the point that this bridge is neither "combined" as in the brick paintings of the Eastern Han Dynasty nor "interlocked", but it is "woven". In other words, it is woven by several horizontal beams on top of a row of vertical beams. I denominated it as "Woven Beam Timber Arch Bridge" with a view to its mechanics similar to that of a beam of a house, which received consent from Professor Shen Weiping, Deputy Chairman of Chinese Society for the Theoretical and Applied Mechanics and structure expert, who differentiates the Bianhe Rainbow Bridge and the existing Zhejiang-Fujian Arch Bridge from the perspective of their structures, and, jointly with Mr. Liu Jie, denominates the former as "Woven Timber Arch Bridge" and the

范畴，他们还运用了历史学、社会学和文化人类学的方法。本书中就有他们与当地专家合作整理出的一些有关廊桥营造活动中的民俗研究成果。

泰顺廊桥可以说是浙闽地区木结构的代表性杰作。历史地、宏观地来看，浙南、闽北属于古闽越文化圈；扩大来说，它应属越文化体系。瓯越、闽越，追究其根源，都是发源于胶东半岛的上古东夷集团。按照不断得到考古学印证的古史传说，发源于青海高原的西部华夏集团的部族，大约在4000余年前东进，与发展壮大而西进的东夷集团相遇。东西两大原始文明的撞击，最终决战于“涿鹿之野”，以华夏集团的黄帝族战胜东夷集团的蔑帝（被黄帝族贬称为害人虫——“蚩尤”）族而告终。未归顺的蔑帝族人四散逃亡，大体上说，部分越海东渡日本，部分经赣、湘转赴西南（现在苗族仍然自称为蚩尤后代），部分向东南沿海迁移。后来江、浙地区的吴越、福建地区的闽越、广东地区的南越，直至越南，都是原始东夷集团移民的后裔。所谓“百越”，在文化上是有渊源关系的。浙南、闽北的泰顺地区，作为瓯越和闽越文化圈，是和北部的杭嘉湖地区有着历史因缘的。将近7000年前的河姆渡文化所反映的高度水准的木结构成就，表明了泰顺虹桥深远的历史文化根基。

泰顺是位于浙江省南部的一个山区县，因其地理位置的特殊，千百年来一直都受着闽越文化与瓯越文化的双重影响。这种影响，在当地保存下来的绚丽的乡土建筑中得到了淋漓尽致的展现。而在种类繁多的乡土建筑中，最具地方代表性的当数种类与数量众多的木构廊桥了。泰顺的廊桥，由于其历史之悠久，技艺之精湛，使它在中国桥梁史上占据着重要地位。只是泰顺山高路远，交通闭塞，具有重要工程技术价值、建筑艺术价值的各式木廊桥至今还不为多数人所认识。现在刘杰副教授与沈为平教授合著的此书问世，必将使泰顺廊桥扬名天下，不仅在中国桥梁史上，即使世界桥梁史上也占有十分重要的地位。

杨鸿勋

2004年9月于北京咫园

latter as "Woven Timber Arch-beam Bridge". I fully agree to their denominations. As Mr. Liu Jie is working on the subject of Rainbow Bridge, Mr. Shen has given him much support and instructionsin determining the names of the bridges, and even participates in the study of the subject. *Lounge Bridges in Taishun* is their cooperative results, so I am very happy to write this Preface for the book.

Lounge Bridge in Taishun may be said to represent the wooden structures in Zhejiang-Fujian Region. The southern part of Zhejiang and the northern part of Fujian used to be a single cultural region in Chinese history, and belong to the Yue cultural system from a macroscopic viewpoint. The ultimate origin of the people is the Pre-historic Eastern Yi Tribe in the east of Jiaodong Peninsula. Successive archeological findings reveal that it took shape in the west of Hua and Xia Tribes on the Qingzang Plateau, who came eastward about 4000 years ago, only to meet the Eastern Yi Tribe who was expanding westward. These two tribes had a battle in Zhuolu and ended up with Yellow Emperor from the west taking victory over the Mie Emperor in the east. The defeated followers of the Mie Emperor fled in all directions, some to Japan, some to Jiangxi, Hunan and then the south-west, and some to the south-east. The people now living in Jiangsu, Zhejiang, Fujian, Guangdong and even in Vietnam were descendants of the Eastern Yi Tribe. Taishun, located in the south of Zhejiang and north of Fujian Provinces, belongs to the general Ou-Yue and Min-Yue cultural circles. The highly skilled wooden structure of Hemudu Culture appearing in this region some 7000 years ago represents the historical and cultural basis for the raibow bridges in Taishun.

Taishun lies among hills on the south of Zhejiang Province. Due to its geographical reasons, it has been under the mixed influence of Min-Yue and Ou-Yue cultures. The remaining vernacular architecture in the region demonstrate how such influence works, and a large number of local-styled timber lounge bridges in various forms are the best representation of such influence. The lounge bridges in Taishun have an important position in the Chinese history of bridges due to their long history and exquisite skills. The timber lounge bridges in Taishun with high engineering values and construction values, however, have been visited by few for its remoteness and poor traffic conditions. Associate Prof. Liu Jie and Prof. Shen Weiping have jointly written this book, and will certainly make it a world-famous place with a significant position in the world history of bridge some day in the future.

Yang Hongxun

Zhi Yuan, Beijing, September 2004

前言

1997年，我当时是建筑学和土木工程合一的建筑工程系的系主任。刘杰应聘该系教职，我主持了面试。这本是系主任日常工作。不久我另有他任，离开该系，对他的印象也淡忘了。

2001年刘杰所著《泰顺》一书由三联书店出版，他特地赠我一本。当晚我翻书一阅，竟然通宵读完了这本书。我即给他打了电话感谢，并表示了对泰顺特别是廊桥的浓厚的兴趣，希望有机会随他去实地看一看。他欣然允诺。

刘杰言而有信，于翌年10月带领我等去了泰顺。实地考察之后，我对刘杰工作赞赏之余，提了三点建议。第一，重视廊桥结构的研究；第二，争取国家自然科学基金的支持；第三，介绍到国际上去。刘杰不负所望，2003年即申请到国家自然科学基金青年项目。我与之合作开展了廊桥结构的研究，成果总结成文，于2004在芬兰第八届世界木结构工程大会上作了报告。目前台湾学者，美国和日本学者已开始与他交流。

我若再年长些，当可捻须笑曰："孺子可教！"从此，我也被吸引到他的研究工作中。2003年的8月和10月以及2004年的8月，我俩又去了泰顺、寿宁、武夷山和庆元等地考察。

泰顺木拱廊桥首先吸引我的是其结构之巧妙。至迟在900年前，建桥工匠已经知道，圆木轴向抗压的能力远大于横向抗弯的能力。但是在当时用编木技术将圆木构成结构稳定的以受压为主的拱桥，真是一个划时代的发明。用现代结构力学观点我们也找不到比它更合理、更好的结构。令我欣喜不已的是在浙闽地区存有包括拱桥在内的数百座古木廊桥，其结构形式丰富多样。将它们梳理归类，可清楚地呈现木桥技术发展的脉络。更令我惊奇的是，当用计算机模拟木拱桥构造，用汴河虹桥捆扎技术代替浙闽木拱桥榫接工艺，后者第二系统中央梁长度缩短至零，自然形成了汴河虹桥的结构。由此我提出了浙闽木拱桥结构技术是在当地发展起来的；汴河虹桥和浙闽木拱桥是同一桥梁结构，适应不同地方联结技术形成的不同形式等假说。

我用头脑理性分析木拱廊桥结构之奇。同时我用心感性享受廊桥之美。2003年8月11日，我和刘杰等冒酷暑驱车前往三条桥。行至公路尽头，下车步行，烈日当空，挥汗如雨。半小时后翻过一个山岗，脚下是一条翠谷，草木葱茏，涧音淙淙，略觉凉意。千米之处，三条桥横卧山溪之上。它简洁本色，如从两侧山体中天然长出一般，与青山绿水浑然一体。我顿觉心弦受到拨动，在共鸣，在呼应。我欲凌空而去；我欲仰天长啸；我欲泪水一泻为快。当时除了包含三条桥的青山之外，世界其余部分于我已不再存在。我终于平静下来，沿鹅卵石铺就的山径，逶迤前行，进入桥内。廊屋内一片清凉世界，凉风习习，极目四望，恍若世外。

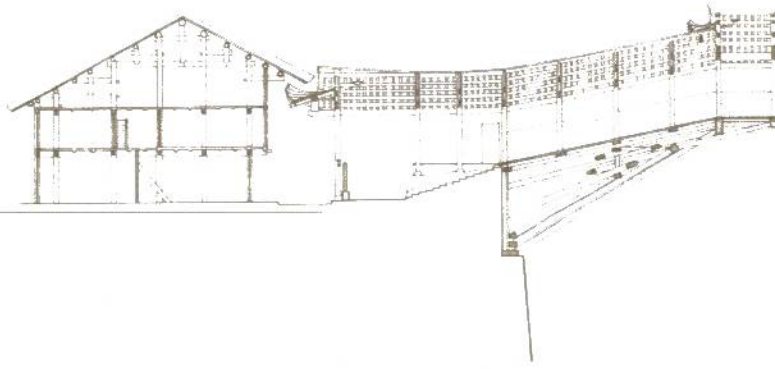
泰顺的廊桥，由于其历史之悠久，技艺之精湛，使它在中国桥梁史上占据着重要地位……

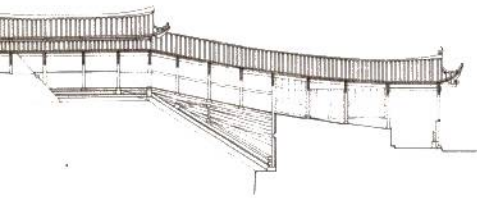
Forewords

Mr. Liu Jie had his book with the title of *Taishun* published by the JPC in 2001 and he presented me with a copy. I read it through the whole night and rang him saying thanks to him and expressed my interest in Taishun, especially the lounge bridges there, and my wish to go there some time. He gave me a positive answer.

Mr. Liu Jie kept his words, and brought me to Taishun in October the next year. By physical expedition, I made three suggestions on his work. First, he shall pay more attentions to the study of the structures of lounge bridges; second, he shall try to obtain support from National natural Scieace Founudation of China (NSFC); third, he shall publish it to the world. Liu Jie did not disappoint me and obtained the support from Young Suientisls Fund of NSFC in 2003. I made a joint study with him in the structure of lounge bridges, the result of which was a report published in the 8th World Conference on Timber Engineering in Finland in 2004. Now scholars from Taiwan, USA and Japan began to exchange ideas with him.

It is the exquisite structures of the timber arch lounge bridges in Taishun that first attracted my attention. Bridge builders began to realize that the compressive strength of a log in the axial direction is much larger than its bending strength in the transverse direction some 900 years ago at the latest. The arch bridges using woven timber technology featuring a stable compressive strength of woven timbers marked the beginning of a great age. Even modern structural mechanics will not find a better and more reasonable structure. What excited me are the multiple forms of the hundreds of bridges still existing in Zhejiang-Fujian region. To classify them in types, one may see how timber bridge technology has developed over the years. I was more excited when the joggle technology of Zhejiang-Fujian Timber Arch Bridge is replaced with the binding technology of Bianhe Rainbow Bridge, with the help of computer Simulation of the structure of arch bridge, the length of the beam at the center of system II of the former will be reduced to zero, and the structure of the Bianhe Rainbow Bridge appears. Thus I assume that the structure technology of the timber arch bridge in Zhejiang-Fujian has been developed





从此我一见不忘，渴望有幸再在她近旁滞留，或于晨曦中，或在夜月下，或当瑞雪时，或处细雨里，再度与她亲近。我在芬兰国际会议上演讲时，把她称为一座最纯粹的古桥，我的梦中情人。三条桥的美是简洁的美，协调的美，实用的美，古朴的美，它融四美于一体，构成美的磁场，感动着每一颗有灵性的心。这样的美不能用头脑理解，只能用心灵感受。

廊桥的价值不仅在于它的奇和美，还在于它的内涵之丰富。刘杰若干年来做了多方位的挖掘，对与廊桥有关的地理、人文、民俗、工艺都有了相当的研究成果积累，部分展现在本书中。

桥梁是道路和溪流、峡谷的交汇点，是道路系统的重要组成部分。如果我们把浙闽山区做成立体模型，数百座桥梁分布其中，结合古道遗存，数百年古道系统将呈现在我们面前。道路是经济和社会生活的血脉，复原的古道系统将对该地区明清历史的研究提供不可替代的参考作用。

本书中最有价值的内容之一，是为造桥工匠立传。我们这些人，头顶教授、建筑师、工程师之桂冠，备受当代社会和民众的尊重，其实不过是古代工匠的继承者。中国的传统文化，鄙薄奇技淫巧，藐视工匠之属。工匠的名字和事迹在正史中几乎空白。鲁班只留了一个名字和些许传说，李冰父子只是都江堰工程的领导者，实际的设计施工人员有谁知道，兵马俑、长城、大运河的建造者的姓名事迹无人知晓。刘杰及其合作者在十分艰难条件下挖掘收集工匠世家的资料，记录入书，留作信史，实在功德无量。面对前辈匠人的杰作，我辈作为继承人只觉汗颜，他们虽然姓名事迹湮没，但作品传世数百年至今光焰照人。而我们的成果论文有多少能历数十年而不被人遗忘。我的博士、教授、博导、理事长的头衔，相形之下只可视作顶上尘土，过眼烟云，何足道哉！

谨以本书献给所有建造了廊桥的工匠们。是年甲申，节近仲秋，皓月渐圆，遥想古人，而盼来者，是记。

沈为平

2004年9月27日于上海交通大学

locally, and Bianhe Rainbow Bridge and Zhejiang-Fujian Timber Arch Bridge are of the same bridge structure but adapted to the requirements of different local technologies.

The value of the lounge bridge lies not only in its beauty but also its rich meaning. Mr. Liu Jie has made a lot of investigations over the years and accumulated considerable fruits of study in respect of geography, humanities, folk customs, arts and crafts, part of which is reflected in this book.

Bridges are central to roads, rivers and valleys, and form an important part to road system. If we make a cubic model of Zhejiang-Fujian mountainous area where hundreds of bridges are distributed and there will appear the century old road system in front of us. Roads are pivotal to economic and social life, and a recovered ancient road system will have an irreplaceable impact on the study of the region in the Ming and Qing Dynasties.

One of the most valuable parts of this book is the biographies of the bridge builders. We are nobody but the followers of these bridge builders though we may be given such titles as professors, architects, engineers etc. and win respect from all walks of life. In the Chinese tradition, skills and techniques were not highly respected, so nearly no craftsmen were recorded in the Chinese history. Lu Ban was an exception who left us but a name and a few hearsays; Li Bin and his son were the leaders for constructing Dujiang Weirs in Sichuan and who knows the names of the designers and site workers; no records could be found about the makers of terra cotta worriers and horses, the Great Wall and the Great Canal. Mr. Liu and his cooperators collected the materials about those bridge construction families through much difficulty and incorporated them in this book. The ancient masters left us with their great achievements without leaving their names, and in comparison, will I be able to keep my contributions in research unforgettable for several dozen years? All my titles as doctor, engineer, and professor are nothing but winds and clouds.

I hereby write these Forewords and contribute this book to those who have constructed the lounge bridges. I miss the great people in the past and wish more of them to come in the future. Looking up at the moon, I see it waxing toward its fullness of the Mid-autumn Festival.

Shen Weiping
Shanghai Jiaotong University, 27 Sept. 2004

作者小传
Biographies of Authors

刘　杰

1970年生于重庆。1993年毕业于西南交通大学建筑系，毕业后进入广州佘畯南建筑师事务所工作，1998年获上海同济大学建筑历史与理论专业硕士学位。现为同济大学博士研究生，上海交通大学建筑系副教授。1995年起，开始系统地学习和研究中国传统建筑与古典园林，在国内外发表论文20余篇；同时致力于中国南方古代木构和乡土建筑的研究，出版了《泰顺》、《库村》、《中国古代建筑环境生态观》（合著）等著作。

沈为平

1946年生于上海。1969年毕业于北京航空航天大学，1982年获上海交通大学硕士学位，1986年获德国斯图加特大学博士学位。现任上海交通大学土木工程系教授，博士生导师，中国力学学会副理事长，上海市力学学会理事长。主要从事计算结构力学和结构工程研究，在弹塑性分析、高性能计算、大跨桥梁结构分析和内力影响面分析等领域发表论文60余篇，出版专著一本。

Liu Jie

Born in Chongqing in 1970, Liu Jie graduated from Architecture Department of South-west Jiaotong University in 1993 before he worked with She Junnan Architecture Studio in Guangzhou, and was granted a master degree for architectural history and theory by Shanghai Tongji University in 1998. He is currently a PHD of Tongji University and associate professor of the Architecture Department of Shanghai Jiaotong University. He started systematic study and research of Chinese traditional architecture and classic gardening in 1995 and has published over 20 dissertations both in and outside China; he is committed to the research of ancient timber structure and vernacular architecture in southern China and has brought to press several books such as *Taishun*, *Kucun Village* and *Environmental and Ecological Ideas in Chinese Ancient Architectures* (co-authorship).

Shen Weiping

Born in Shanghai in 1946, Shen Weiping graduated from Beijing University of Aeronautics and Astronautics in 1969, and was awarded a master degree by Shanghai Jiaotong University in 1982 and a PHD degree by Stuttgart University of Germany in 1986. He is currently a professor of the Civil Engineering Department of Shanghai Jiaotong University, doctorial advisor, Vice Chairman of Chinese Society for Theoretical and Applied Mechanics, and Chairman of Shanghai Society of Mechanics. His research field ranges from computational structural mechanics to structural engineering, and has published over 60 dissertations covering a wide range of elastic-plastic analysis, high performance computing, structural analysis and internal force influence surface of large span bridges, etc. and brought to press a monograph.

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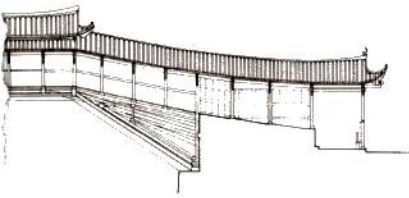
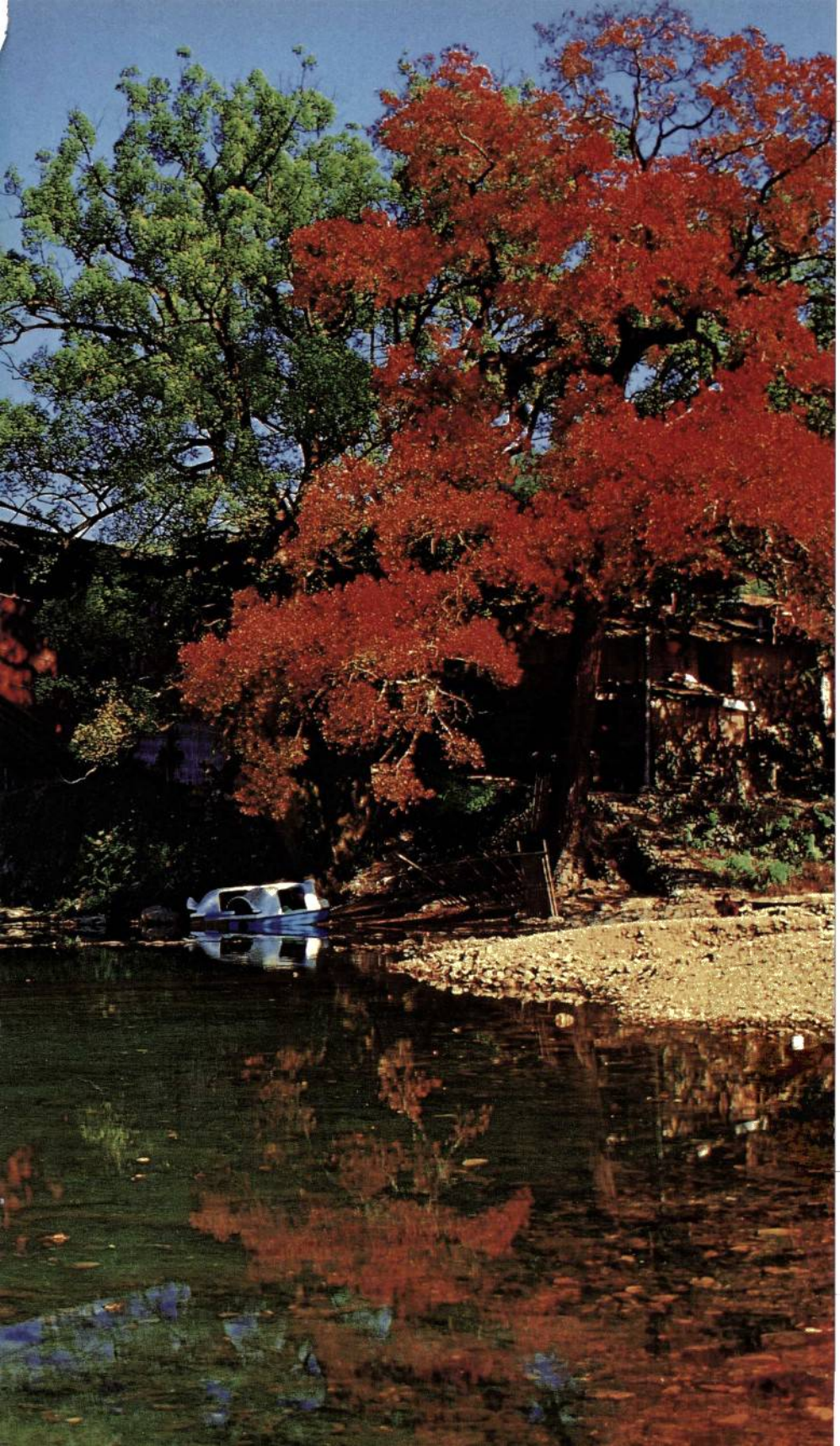
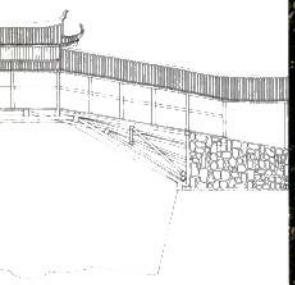
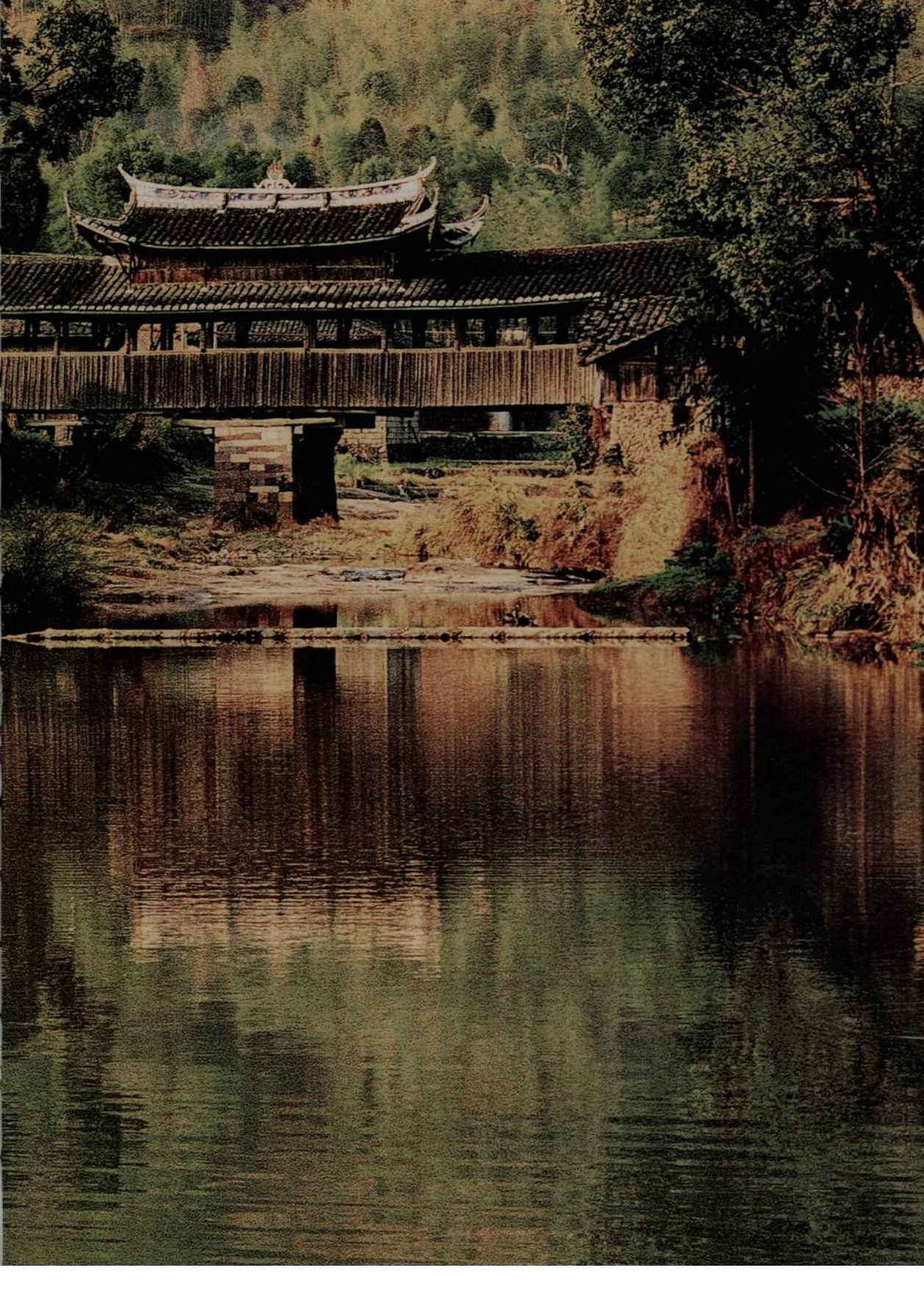




北涧桥
Beijian Bridge



永庆桥
Yongqing Bridge



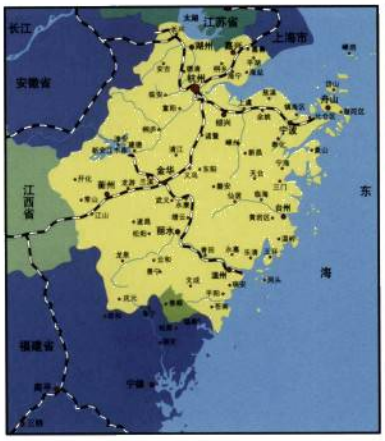
文兴桥
Wenxing Bridge

泰顺廊桥生成的地理环境和人文背景

Taishun Lounge Bridge: Its Geographical Environment and Human Background

泰顺县位于浙江南部，百里岩疆。至1990年，县境处北纬27° 17′ 36″～27° 48′ 34″，东经119° 37′ 9″～120° 14′ 56″之间。东邻苍南，西南与闽福鼎、柘荣、福安、寿宁相连，西北界景宁，东北接文成，总面积1761.5平方公里，其中林地与草山170.03亩，占64.3%；水域86.6平方公里，占4.9%；耕地15.04万亩，占5.7%，素有“九山半水半分田”之称[①]。县治罗阳镇，北距省会杭州430公里，东北距市治温州176公里[②]。2003年年底以来，下设11个镇，25个乡。辖306个行政村，总人口34.7万多人。以汉族为主，畲族居次，回、满、侗、黎、苗极少。

泰顺县地处华夏古陆东南部的一级隆起带上，洞宫山脉呈西北－东南走向入境，南雁荡山的支脉则自东北边境向西南延伸，双脉十字交叉，剧烈切割，形成崇山峻岭、旷谷幽回的中山地貌，世称“浙南屋脊”。县境地势由西北向东南倾斜。西北部是洞宫山脉的延伸，东南部属南雁荡山脉。大小山峰星罗棋布，谷峰连绵起伏，山间小谷众多。千米以上的山峰有179座，与景宁畲族自治



◎ 中国浙江省地理位置图
Map of its geographical position in Zhejiang Province of PRC

◎ 泰顺县地理位置图
Map of the geographical position of Taishun County

◎ 飞瀑
Waterfall

◎ 高山云雾
Winds over high hills

◎ 梯田
Terraced fields

Taishun is in the south of Zhejiang Province; it borders Cangnan in the east, Fuding, Zherong, Fuan and Shouning of Fujian Province in the southwest, Jingning in the northwest, and Wencheng in the northeast, covering a total area of 1761.5 square km.

县交界的白云尖，为全县的最高峰。较大的河谷平原有莒江（惜因建珊溪水库而被淹没）等地；典型的山间盆地有罗阳、三魁、大安等；高山平台有南院。

泰顺境内大小河流百余条，纵横交错，汊坑密布，呈多干树枝状，分属飞云江、交溪、沙埕港、鳌江四水系。水域面积86.6平方公里，占土地总面积的4.9%，与“九山半水半分田”的俗语相合。因受地质构造运动和地势影响，溪谷狭窄，河床峻陡，河道落差大，源短湍急，溪水暴涨暴落，均属山间溪流，处处飞瀑处处滩，因此县境内以百丈命名的地方尤其多。

泰顺县境属亚热带海洋型季风气候区，四季分明，气候温和，雨量充沛。春夏水热同步，秋冬光热互补。高山云雾弥漫，丘陵温和润湿。以候平均气温划分四季：低于10℃为冬季，高于22℃为夏季，介于两者之间为春、秋两季。

“一般说来，地理环境和人文背景孕育了一地乡土建筑的特色。但是在地理、人文与建筑之间还有层中介，就是居民的文化素质和生活方式。”[3]那么，影响泰顺乡土建筑风格至巨的正是乡民的耕读生活与山水情怀，这种情怀也反映在形形色色的泰顺廊桥之上。

泰顺许多村落、房舍和桥梁都非常质朴天然，蛮石素木、粉壁青瓦加上泰顺特有的复杂多变的屋顶造型，使其乡土建筑独具动人的魅力。这魅力的根源来自当地乡民对文化高度追求的耕读生活及蕴含在文化中的对大自然的热爱。耕读生活和山水情怀在中国传统文化中有很高的道德价值，它本身就意味着高尚、超脱，是“士”这个知识阶层陶情冶性的寄托。“采菊东篱下，悠然见南山”的生活，受到有“东南小邹鲁”之称的温州士绅们的倍加推崇。“从来山川奇杰

Taishun lies on the first ridge of the southeast part of the Ancient Huaxia Land, where hills and peaks scatter and valleys are spread. There are 179 peaks of more than 1000 meters high.

There are more than 100 rivers, narrow or wide, covering the region; valleys are deep and riverbanks steep; river courses fall at varied heights; creeks run rapidly, and tides ebb and flow frequently; waterfalls are everywhere to find.

Taishun is of the subtropical maritime and monsoon climate, and has four seasons with a warm climate and plenty of rain. In spring and summer, water and heat arrive together whereas in autumn and winter, sunshine and heat are mutually complementary. In high hills clouds abound, and in valleys and hills warmth and moisture gather.

Taishun abounds in hills, forests and rivers. The beautiful scenes and the culture of inclination for natural beauty have helped develop the love of hills and waters, which is represented in the timber arch lounge bridges. History has it that many people moved to Taishun with their entire families for the love of its hills and waters. The men of letters in Taishun, cultivated from the traditional Chinese culture, have a deep understanding of natural beauty and the capacity of turning the natural beauty into the beauty of human environment. The pure and simple beauty of the Nature is incorporated in the houses of the ancient people in Taishun as well as the lounge bridges they built.

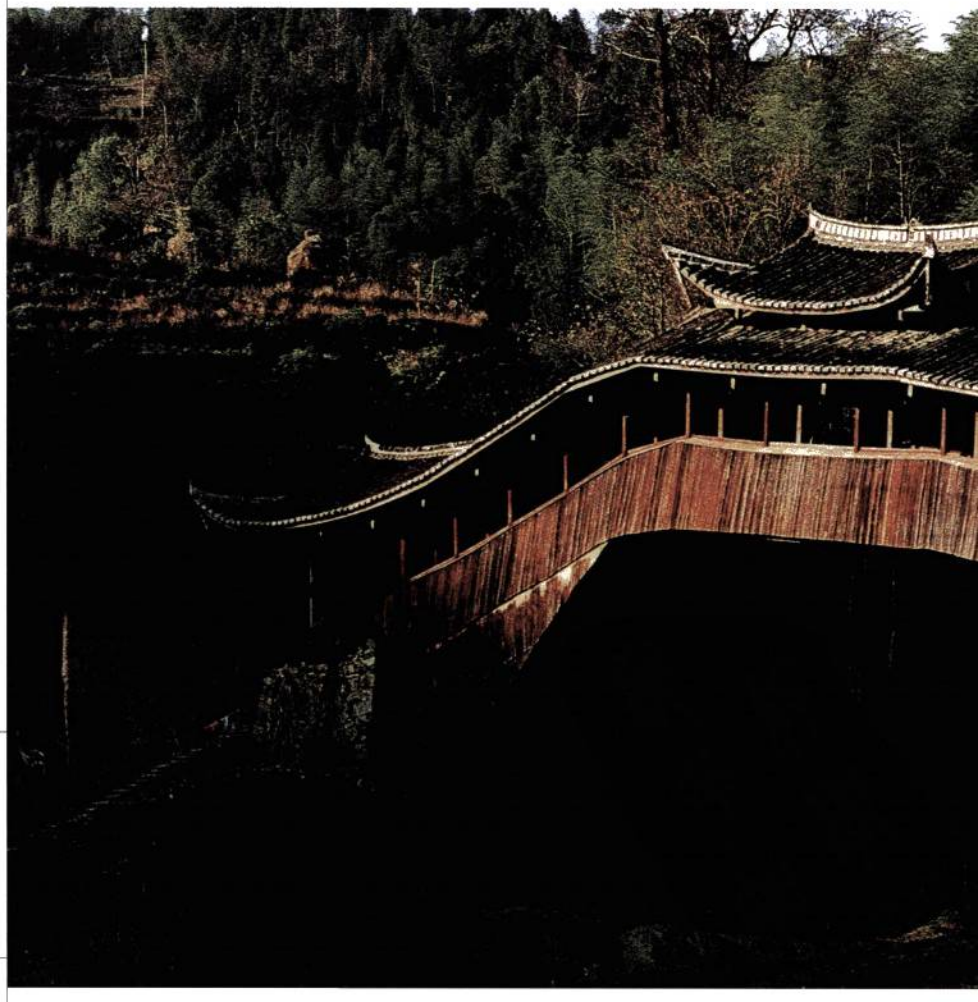
秋林
Autumn woods

泰顺人善于将大自然的那种真纯与朴实深深地融进建造的廊桥和房舍中。
People in Taishun successfully incorporate the pure and simple beauty of the Nature in the lounge bridges and houses they built.

之处，必生嵚崟磊落之才”，在泰顺各地，耕读生活和山水情怀就贴近了普通农民的生活和心理，在一定程度上成了他们的希望和追求，从而使得泰顺廊桥有着健康和清新的气息。

泰顺山高林密，溪流纵横。秀丽的风光与文化中热爱自然之美的传统，一起哺育了泰顺人的山水情怀。这种山水情怀特别地表现在木拱廊桥之上。据史料记载，有许多人士就是倾羡泰顺山水之美而不惜举家徙来。深受传统文化熏染的泰顺文人绅士对自然之美体会很深，他们也善于将自然之美化为鬼斧神工的人造环境。大自然的那种真纯与朴实也深深地融进了泰顺先民们的房舍与建造的廊桥之中。

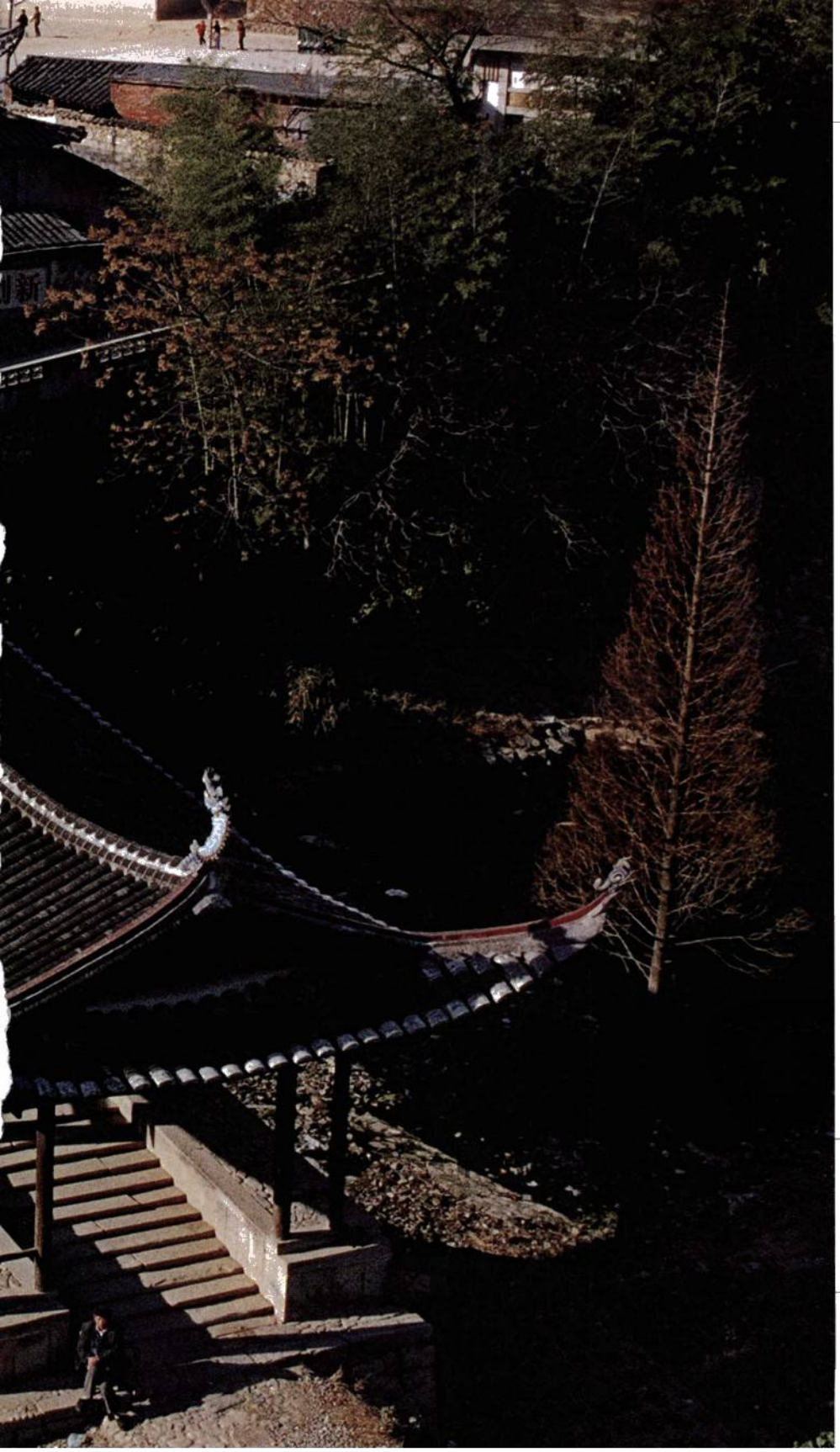
秀丽的山水涵养出泰顺文人独有的气质和人文特色。这种气质也显现在



廊桥那翘曲飘洒的屋顶，像搏击长空的鹰翼那样灵动。
The protruding roof of the lounge bridge looks like a flying eagle.

泰顺建筑的风格上。古老的村落、房舍和古道廊桥虽然朴实无华，却都舒展开朗。他们善于利用天然材料的本形、本性、本色，使建筑与天地和谐。许多人家使用不加斩凿的蛮石墙，弧形放足，粗犷有力，立在大块卵石铺就的地面上，整个村落仿佛从荒古时代就与山岩同时生成。他们喜欢用素面原木，随弯就曲，巧妙地把它们安装在恰当的位置上，好像就应该有那样的弯曲。带着生命原有的形状，它们与庭前的树木和一切生命相呼应。由于绝少雕琢，木石尽可能地保存着天然本色，即使有少量的加工，亦出自人类双手天然的能力。这就孕育了泰顺乡土建筑给人的亲切感。建筑物的形式也很自然，宜廊则廊，宜堂则堂，轻巧的披檐自在地遮挡着一切应该遮挡的地方。尤其是廊桥那翘曲飘洒的屋顶，像搏击长空的鹰翼那样灵动。


勤奋
求实



◎ 溪东桥和临水宫
Xidong Bridge and
Linshui Temple

溪东桥
Xidong Bridge

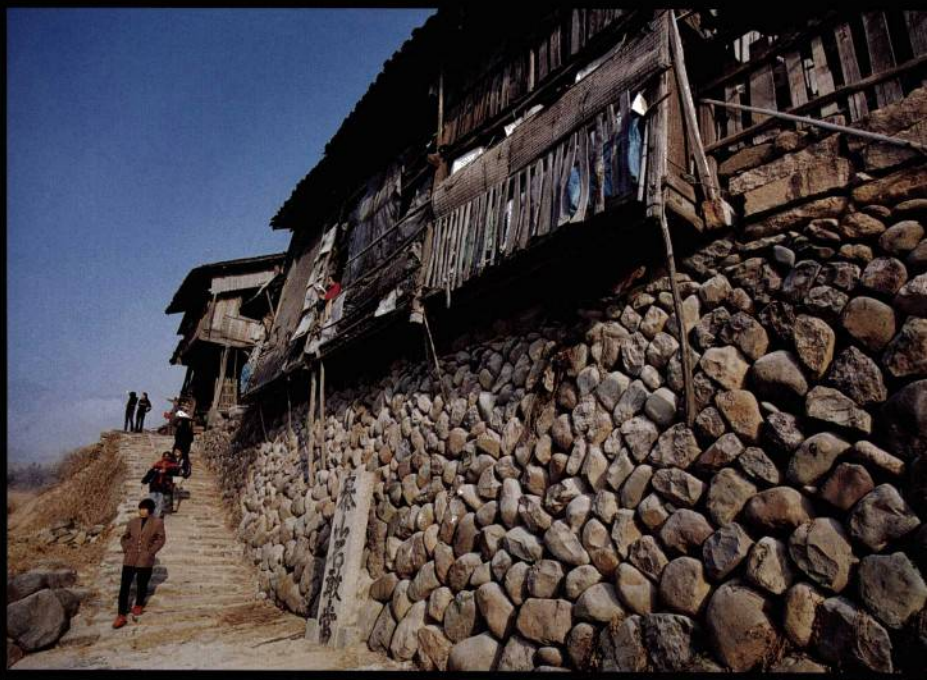
泰顺乡民
Villagers in Taishun

◎ 百家盛宴庆丰收
Community harvest festivity

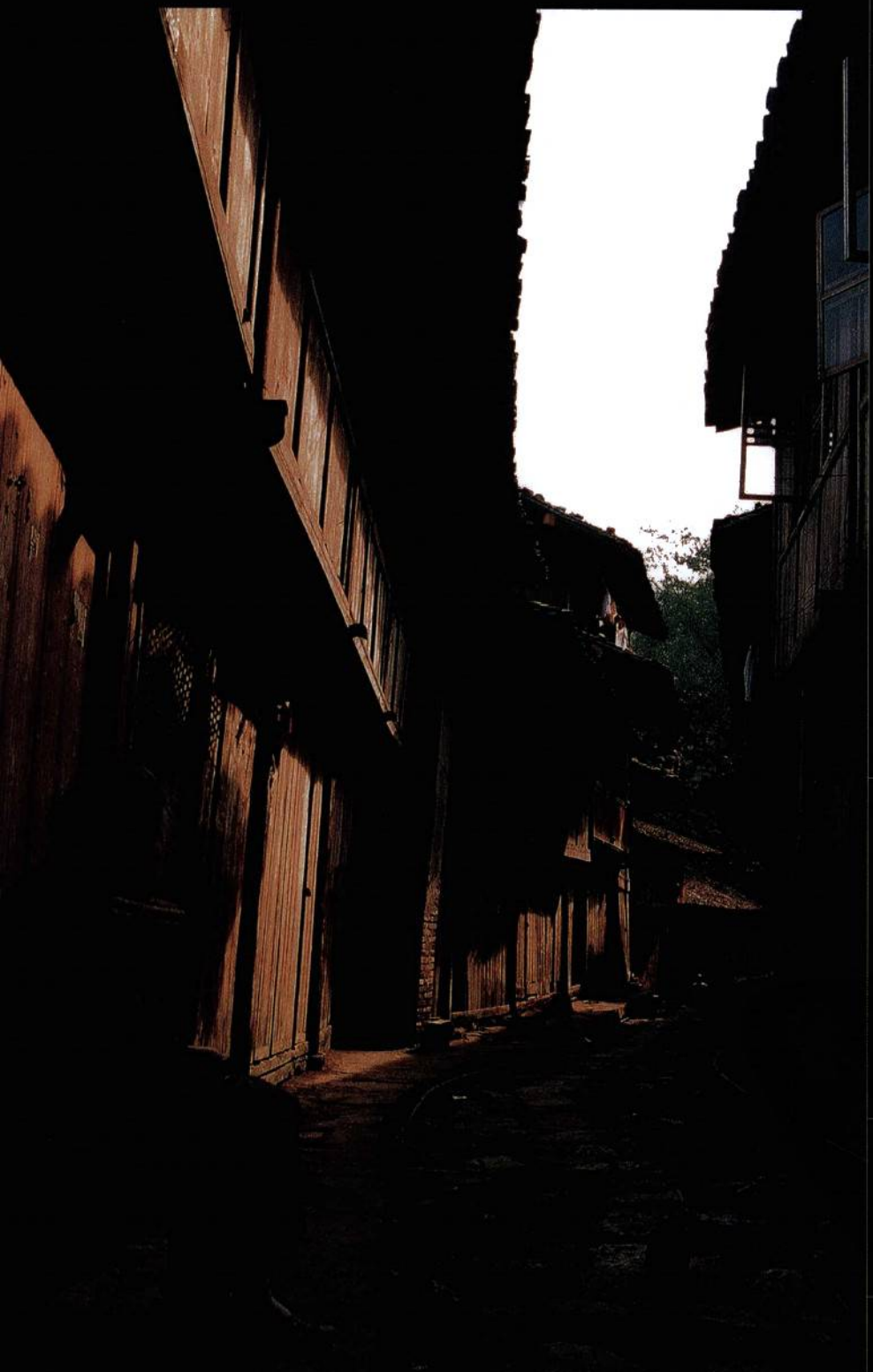
◎ 寄托着新年希望的舞龙
Dragon dance of the New Year

◎ 社戏
Village theatricals

◎ 婚嫁
Wedding



卵石砌筑的石屋尽可能保持本色，宛如与山岩同生。
Houses of cobblestone are reserved as they were and look like part of the rock



TAISHUN
CORRIDOR BRIDGE

【注释】
①详见《泰顺县志》1996年编。
②详见《浙江省地图册》中华地图学社1995年版。
③详见陈志华著《楠溪江中游乡土建筑》，台湾汉声杂志社出版，第一册，第62页。

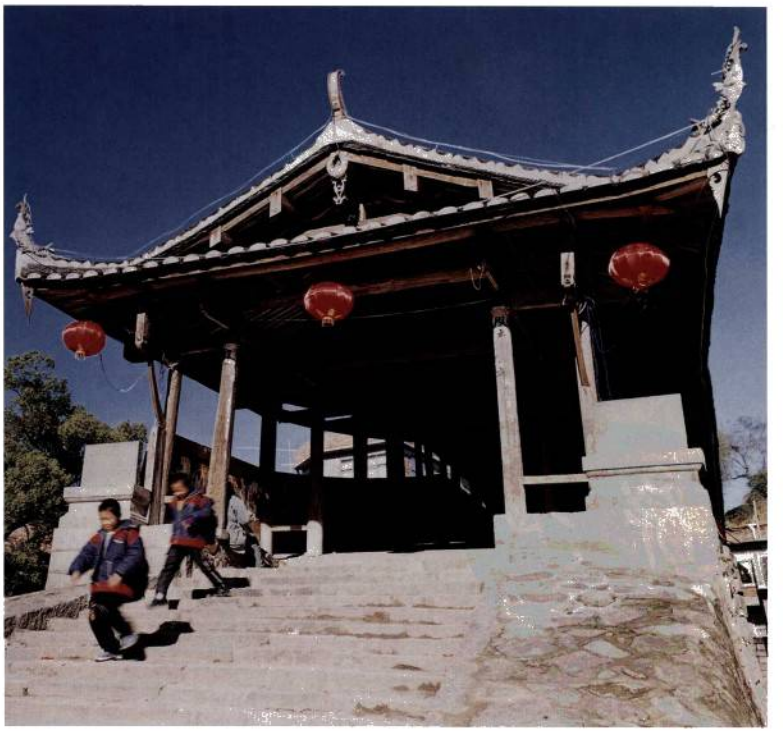
朴实无华、绝少雕琢的房舍
Houses of the pure and simple beauty without much superficial decoration

泰顺桥梁的历史发展演变

Historical Development of Taishun Bridges

泰顺地属浙南高山地带，由洞宫山脉和南雁荡山脉的支脉构成，层峦叠嶂，沟壑纵横。海拔千米以上的高峰竟达 179 座。溪涧主流有百丈溪、仕阳溪、寿泰溪、彭溪等，分别汇入飞云江、三都湾、沙埕(chéng)港三水系。泰顺县交通以陆路为主，唐代以后道路、桥梁逐渐开拓建造。古道有县治罗阳通往温州的“温州大道”，沟通浙闽两省的“桐山大路”。就在这两条古道上，有历代建设的铺舍、路亭和各种桥梁，再加上散落于乡村间的形形色色的古廊桥和矼步，从而构成了泰顺乡土环境中的交通系统。

泰顺是桥梁的故乡，素有“古桥博物馆”的美称。其中的薛宅桥、溪东桥、北涧桥、仙居桥和三条桥等木拱廊桥在中国古代桥梁建筑史上占有重要的地位，可称是泰顺乡土建筑之瑰宝，也是泰顺先民为后世留存的一份宝贵文化遗产。



薛宅桥
Xuezhai Bridge

溪东桥
Xidong Bridge

三条桥
Santiao Bridge

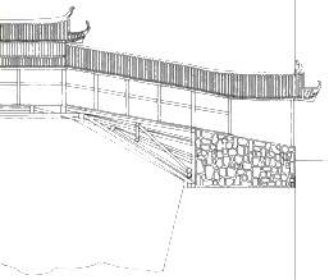
仙居桥
Xianju Bridge

Taishun is famous as a "Museum of Ancient Bridges" and the hometown of bridges. These timber arch lounge bridges such as Xuezhai Bridge, Xidong Bridge, Beijian Bridge, Xianju Bridge and Santiao Bridge, etc. are important in the Chinese history of ancient bridge construction. They are essence of the vernacular architecture in Taishun and part of the precious cultural heritage handed down from the ancient people in Taishun.

北涧桥
Beijian Bridge

泰顺的民间桥梁

Folk Bridges in Taishun



仙居桥畔
Xianju Bridge

如果说绍兴是平原水网上的桥乡，那么泰顺则是高山溪涧上另一类型的桥乡。桥梁，在前者是作为水陆交通的立体交叉，后者仅仅是为步行者提供方便。绍兴石桥，早已名满天下；泰顺的木拱桥，其悠久的历史，精湛的技艺，在中国桥梁史上也占据着重要的一席。虽然山高路远，信息闭塞，随着近年来众多学者的研究整理以及宣传，使得泰顺廊桥声名渐播，具有重要工程技术价值、艺术价值和观赏价值的木拱廊桥将逐渐地被更多的人所认识、鉴赏。

泰顺民间桥梁不仅数量众多，而且其结构类型也多种多样。据《泰顺县交通志》记载，到1987年底，泰顺共有桥梁958座，总长16829多米，其中解放前修建的476座，7923米。所有的桥梁按结构类型可分为木拱桥、木平桥、石拱桥、石平桥和其他种类型。

木拱桥（泰顺俗称蜈蚣桥）：现存六座半，因红军桥一半在福建省寿宁县，一半在泰顺，故两县各计半座，除红军桥解放后新建外，其余皆建于明清两季。

木平桥：是泰顺古桥类型之一，全县现存22座，以明代的刘宅桥年代最古。

石拱桥：是泰顺的主要桥梁类型，历史悠久，数量是所有桥梁中最多的。

石平桥（石板桥）：全县共有349座，其数量仅次于石拱桥。

由于泰顺地区多风多雨，尤其是每年夏秋之际的台风季节，所以当地造桥多在桥身上加建桥屋，也称廊屋，故此类桥梁常常被叫作廊桥（Lounge Bridge）。廊桥只是对加建了廊屋的桥梁的一个泛称，并不针对桥梁建筑的下部结构而言。

包坑桥位于新浦乡桥头溪村，系木平梁廊桥，建于民国十五年（1926），廊屋7间，桥长15.3米，廊屋宽3.6米，桥屋高3.9米，离正常水面高5.6米，跨径7.9米。

北洋桥位于翁山和平村，始建年代不详。系木平梁廊桥，桥长12.7米，廊屋宽3.4米，桥面宽3.7米，桥屋高3.5米，离正常水位高4米，跨径10.3米。

城水桥又叫神水桥，位于龟湖镇后章岗村，系八字撑木拱廊桥，建于民国三十一年（1942）。桥屋七间，桥长15米，宽4.6米，桥屋高4.8米，跨径11.2米，水面至桥面高5米。

The folk bridges in Taishun feature not only in their large number but also their multiple types of structure. According to the book with the title of *Transportation Records of Taishun*, there exist 958 bridges with a total length of 16,829 meters in Taishun as of 1987. They may be divided by types of structure into timber arch bridge, timber beam bridge, stone arch bridge, stone beam bridge and many other types.

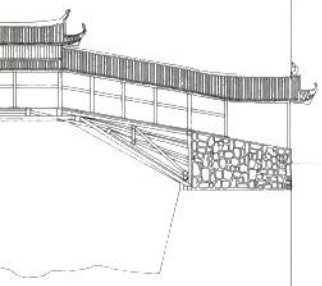
Windy and rainy, Taishun suffers from typhoon at the turn of summer and autumn each year, therefore a house is added to the body of a bridge, which is called a lounge house, and such a bridge is usually called a "Lounge Bridge". A lounge bridge is nothing but a general name for a bridge bearing a lounge house, without referring to the lower part of their bridge construction.

Baokeng Bridge in Qiaotouxi Village of Xinpu Township, built in 1926, is a timber beam lounge bridge with 7 lounge houses, 12.7 meters long, 3.4 meters wide and 3.9 meters high for the house, standing 4.3 meters above the normal water level with a span of 7.9 meters.

Beiyang Bridge in Heping Village of Wengshan, built in a year unknown, is a timber beam lounge bridge, 12.7 meters long, 3.4 meters wide for the house and 3.7 meters wide for the bridge floor, and 3.5 meters high for the house, standing 4 meters above the normal water level with a span of 10.3 meters.

Chengshui Bridge, also known as Shenshui Bridge, located in Zhanggang Village behind Guihu Town, built in 1942, is a timber arch lounge bridge supported by 2 pillars standing astride. It has 7 lounge houses, 15 meters long, 4.6 meters wide and 4.8 meter bridge surface.

北洋桥
Beiyang Bridge



池源桥位于横坑乡池源村，系八字撑木拱廊桥，咸丰三年（1853）被洪水冲毁，咸丰七年（1857）重建，桥身长21米，桥面宽4.3米，离正常水面4.4米，桥屋高4.1米，跨度9.5米，桥屋8间，重檐。

道均垟桥（水尾桥）位于岭北乡道均垟，系石拱木廊桥。始建年代不详，民国八年（1919）重建，桥屋长25.7米，桥屋宽4.6米，拱矢高4米，桥屋高6.2米，跨径9.8米，十二间，重檐。

墩头桥位于柳峰乡墩头溪上，系木平梁廊桥，始建年代不详，脊檩上记为清道光十二年（1832）重建。长16.4米，宽4.5米，跨径8.7米，离水面高1.6米，东西走向，主体为砖石结构，砖砌法为一顺一丁式。桥屋面阔七开间，32柱，梁架为抬梁式。两层挡风板，在上层挡风桥上设“望窗”。桥身用九根大木横架，平梁直径35厘米不等。

红军桥离泰顺县城西约15里，横跨于浙江省泰顺县与福建省寿宁县犀溪乡李家山村交界溪上，系编木拱梁廊桥，建成于1954年12月6日，长39米，净跨32.9米，宽5米，桥台宽6米。桥屋采用七架两廊抬梁式，屋脊装饰简单，用瓦斜靠或用脊砖压栋，檐角微微起翘。该桥风雨板使用得非常多，最上一层的风雨板设有“望窗”，供人们在桥内往外眺望，并可起到通风的作用。

Chiyuan Bridge, located in Chiyuan Village of Hengkeng Township, is a timber arch lounge bridge supported by 2 pillars standing astride. It was washed away by flood in 1853 and rebuilt in 1857, bearing 8 lounge houses with a double-eaved roof, 21 meters long, 4.3 meters wide, 4.4 meters above the normal water level, 4.1 meters high for the house with a span of 9.5 meters.

Daojunyang Bridge (or Shuiwei Bridge), located in Daojunyang Field of Lingbei Township and built in a year unknown, is a stone arch bridge with timber lounge houses. It was rebuilt in 1919, bearing 12 lounge houses with a double-eaved roof, 25.7 meters long and 4.6 meters wide for the house, 4 meters high for the arch and 6.2 meters high for the house, with a span of 9.8 meters.

Duntou Bridge, located on Duntou Creek of Liufeng Township and built in a year unknown or rebuilt in 1832 according to the carvings on its purlin, is a timber beam lounge bridge. It runs from east to west, constructed mainly with bricks which are laid crosswise, 16.4 meters long, 4.5 meters wide with a span of 8.7 meters, 1.6 meters above the water level, bearing on its surface 7 lounge houses, with 32 pillars and a supporting beam type. On the upper layer of the two windbreaks is arranged a lookout window. The bridge is horizontally supported by 9 big beams with an average diameter of 35cm.

道均垟桥廊屋梁架
Beams of lounge house on Daojunyang Bridge

道均垟桥
Daojunyang Bridge

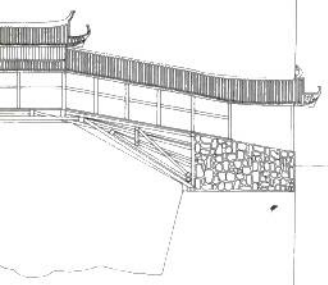
龙坪桥位于龟湖镇后章龙坪村，系木平梁廊桥，建于民国五年（1916）八月初三建造辰时大吉，桥屋长14.1米，桥屋宽4.2米，桥面宽4.4米，桥屋高5.4米，跨径7.1米，6间桥屋。

南庆桥位于下洪乡上洪村，系八字撑木拱廊桥，建于清光绪年间（1875～1908），又称宫桥，田野有一宫与桥遥相呼应。悬山顶，山花砌墙。桥全长16米，宽4.4米，跨径9米，离正常水面高5米，桥屋7间。

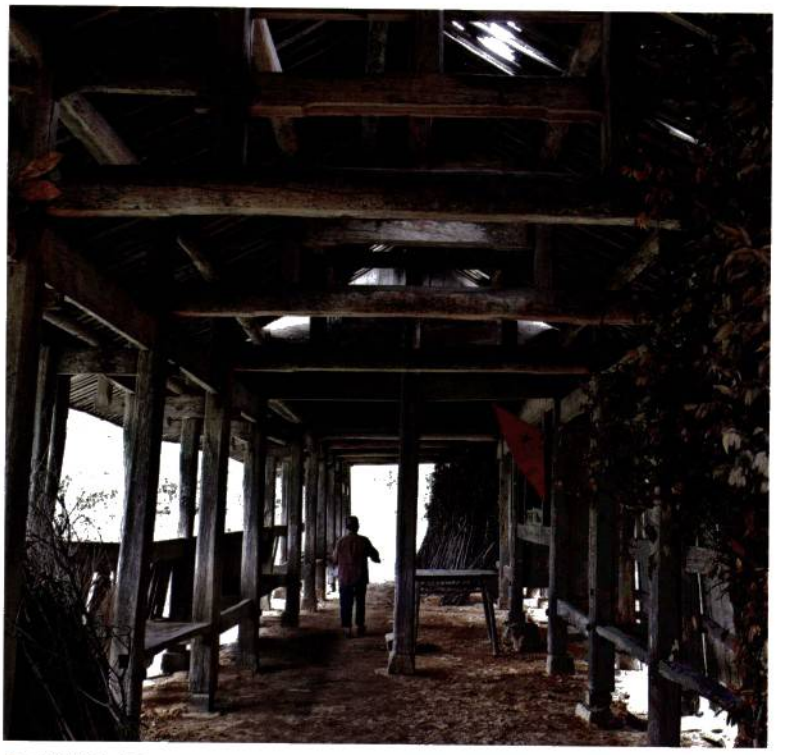
南溪桥位于泗溪镇南溪，系木平梁廊桥，清道光二十二年（1842）3月16日重建，桥长20.4米，宽4.9米，高4.9米，跨径6.8米。歇山顶，七架两廊抬梁式结构，廊屋中间一侧设神龛，造型古朴典雅。

南阳桥又称玉岩桥，位于泗溪镇岩头村，伸臂梁木平廊桥，清同治九年（1870）建。长41.7米，宽4.6米，高5.9米。为重檐歇山顶。南阳桥的构造特点是在溪中建石墩，然后在墩上叠架木梁，向左右平衡伸展。

普宾桥位于雅阳镇新久村，系木平梁廊桥，建于清嘉庆廿五年（1820）。桥长13.6米，桥屋宽4.3米，桥屋高3.7米，跨径8.5米。



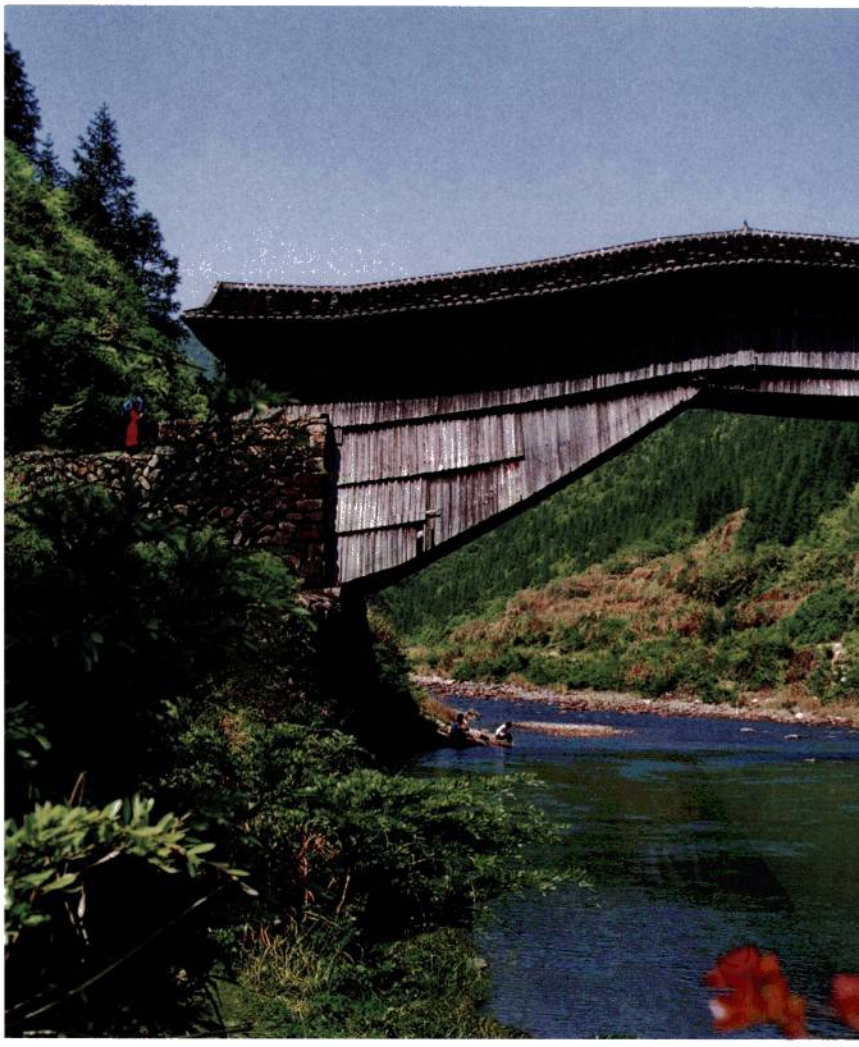
道均垟桥内神龛
Shrine in the Daojunyang Bridge



道均垟桥（内景）
Daojunyang Bridge (interior view)

红军桥
Red Army Bridge

Red Army Bridge, some 15 li away to the west of Taishun County, stands across the boundary creek of Taishun County of Zhejiang Province and Lijiashan Village, Xixi Township, Shouning County, Fujian Province. Built on 6 December 1954, it is a woven timber arch-beam lounge bridge, 39 meters long with a net span of 32.9 meters, 5 meters wide and 6 meters wide for its abutment. The lounge houses are built in the style of supporting beams with a double lounge of 7 racks. Its roof ridge is plainly decorated, with tiles leaning against it or ridge bricks pressing the ridgepole, and the eaves slightly



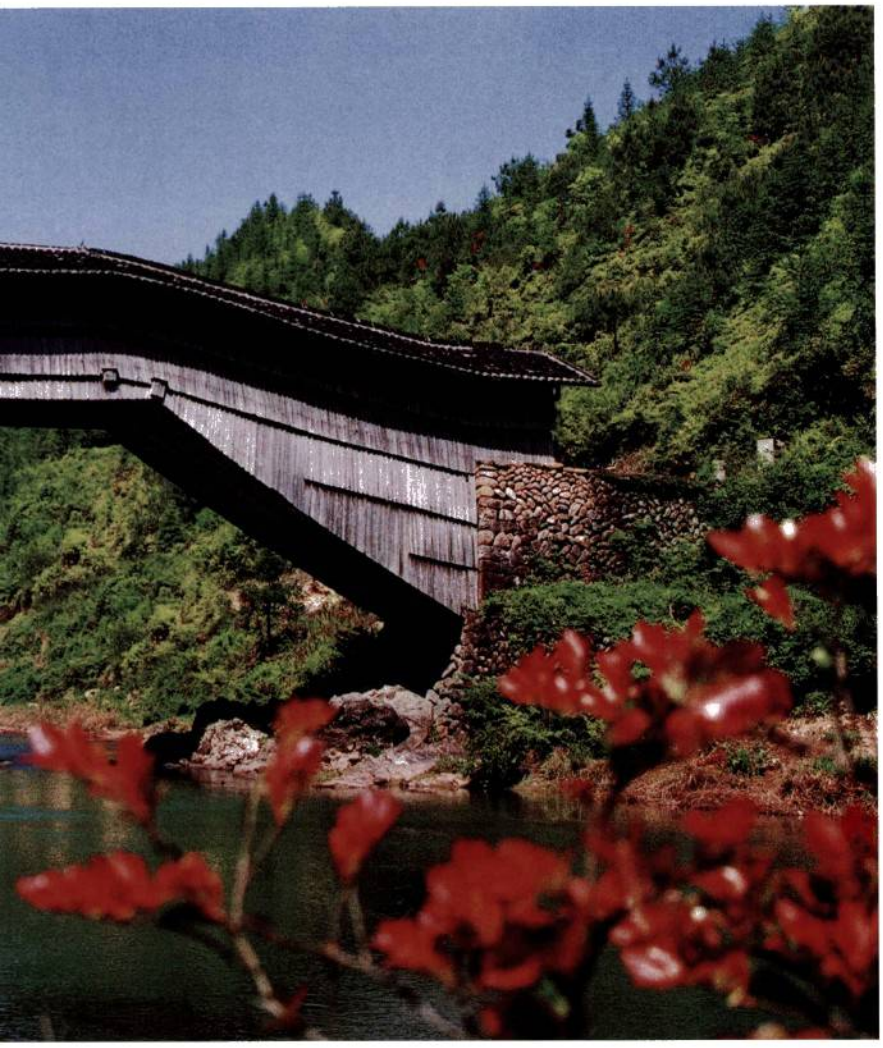
◎ 红军桥
Red Army Bridge

protruding. Windbreaks are widely used and on the highest layer is arranged a lookout window, which provides a view and helps ventilation.

Longyang Bridge, located in Houzhanglongyang Village of Guihu Town and started in 1916, is a timber beam lounge bridge with 6 lounge houses. It is 14.1 meters long and 4.2 meters wide for the house, 4.4 meters wide for the bridge floor, 5.4 meters high for the house with a span of 7.1 meters.

Nanqing Bridge, located in Shanghong Village of Xiahong Township and built be-

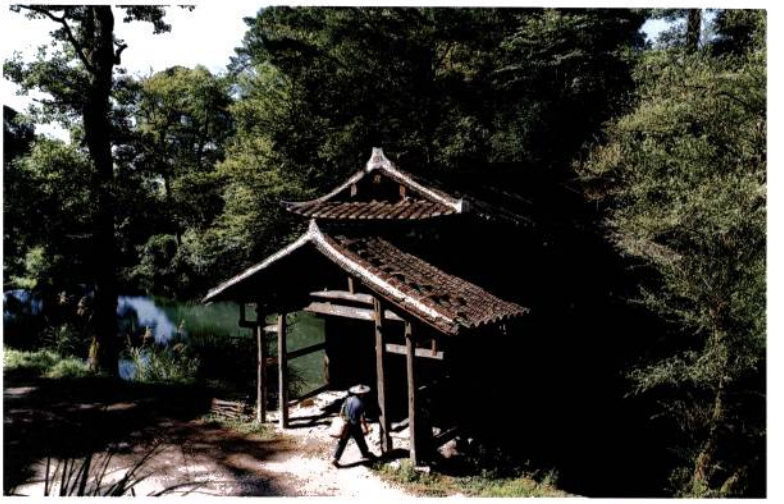
◎ 道均垟桥
Daojunyang Bridge



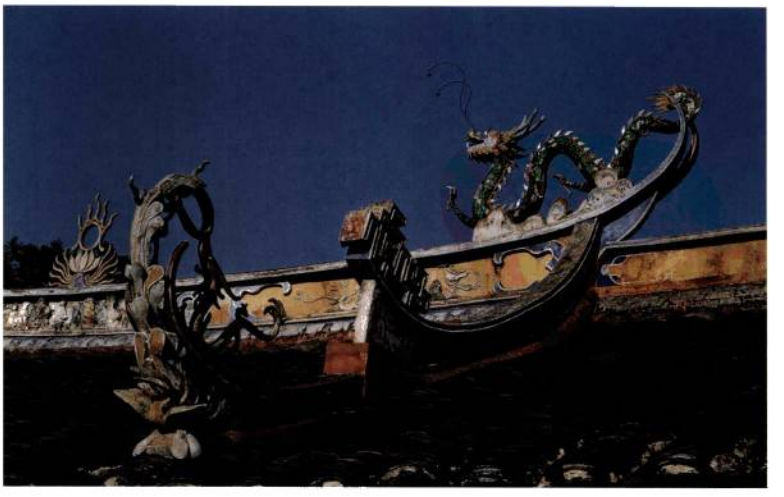
旗峰桥位于翁山外垟村，系石拱木廊桥，建于民国十三年（1924），石拱木廊桥。桥长22.6米，桥屋宽4.4米，桥屋高4.4米，跨径14.2米。

桥底桥位于翁山乡外垟村，系石拱木廊桥，宋代始建，民国十八年（1929）重建。桥屋宽4.3米，3间，桥屋长9米，跨径3.3米，桥屋宽4.5米，离水面高2.3米。

三柱桥位于三魁镇下武洋村，始建年代不详。系木平梁廊桥面阔七开间，梁架结构为穿斗式与抬梁式相混合，悬山顶，此桥周边环境优美，溪水潺潺，古树掩映，田野宽阔。全长15.4米，宽4.5米，跨度10.1米，距正常水面3.2米。



龙垟桥
Longyang Bridge

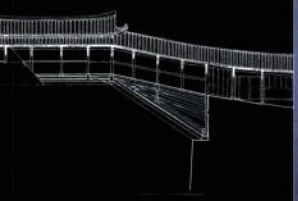


南溪桥廊屋脊饰
Decorations on the ridge of lounge house of Nanxi Bridge

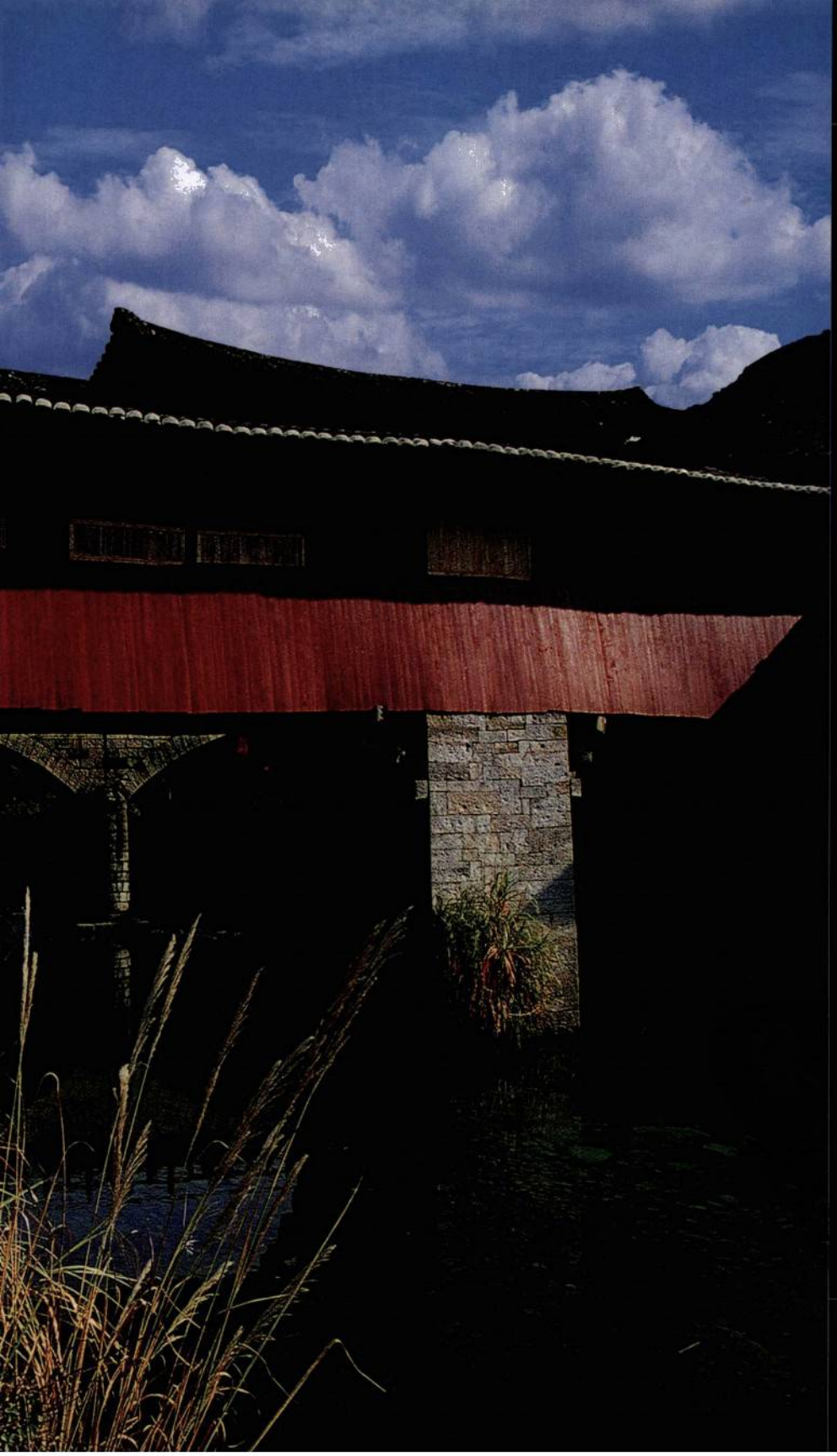
tween 1875 and 1908, is a timber arch lounge bridge supported by 2 pillars standing astride. It is also known as "Palace Bridge", for there is a palace in the field as opposed to the bridge in the distance. It has a overhanging gable roof with walls decorated with flowers. The bridge has 7 lounge houses, 16 meters in its total length, 4.4 meters wide with a span of 9 meters, 5 meters above the normal water level.

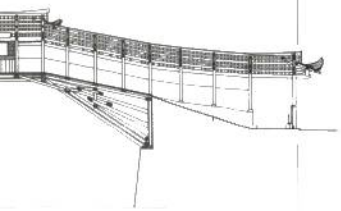
Nanxi Bridge, located in Nanxi of Sixi Town and built in 1842, is a timber beam lounge bridge, 20.4 meters long, 4.9 meters wide and 4.9 meters high with a span of 6.8 meters. It has ancient classical structure with a tilted roof in the style of supporting beam type with a double lounge of 7 racks. On one side of the lounge house in the middle rests a shrine for idols.

普宾桥
Pubin Bridge



南阳桥
Nanyang Bridge





霞光桥位于横坑乡华垟村，为石拱木廊桥，始建于清雍正元年（1723），咸丰二年（1852）和同治十三（1874）两度重建。桥屋长17.3米，跨径13.2米，桥面宽4.4米。桥屋高4.3米，拱矢高7.3米，7间，重檐。霞光桥系石拱木廊桥，平整的石头砌成的桥拱呈半月形，石拱之上，架起廊屋七间。廊屋外附木板挡风，上设屋檐蔽雨。屋檐为重檐式，屋脊平缓有序，转折处弯曲有度。翼角稍稍伸出后，微微起翘，给屋顶增添了些许动感，有飞扬之势。

泰福桥又叫坑口桥，位于岭北上洋村，系石拱木廊桥，全长27米，跨径11米，桥面宽4.1米，拱高5米，桥面离正常水位高5.8米，桥屋高4.8米。

榴垟桥位于翁山乡温垟村，始建于光绪三十二年（1906）丙午冬吉旦，民国二十九年（1940）重建，系石拱木廊桥，桥长10米，桥屋宽4.4米，桥屋高4.7米，桥面离正常水位高3.5米，跨径4.6米。

文重桥位于筱村镇东垟村水尾，为伸臂梁木平廊桥，始建于清乾隆十年（1745），屡建屡毁，民国十年（1921）重建。廊屋11间，46支柱，桥面宽4.7米，全长26.2米，净跨22.4米，为重檐歇山顶。

◎ 旗峰桥（内景）
Qifeng Bridge (interior view)

Nanyang Bridge (also known as Yuyan Bridge), located in Yantou Village of Sixi Town and built in 1870, is an piled cantilever timber beam lounge bridge, with a double-eaved gable and hip roof, 41.7 meters long, 4.6 meters wide and 5.9 meters high. The structure of Nanyang Bridge features the stone pier standing in the middle of the creek, combined with timber beams, which extend sideways evenly and horizontally.

Pubin Bridge, located in Xinjiu Village of Yayang Town and built in 1820, is a timber beam lounge bridge, 13.6 meters long, 4.3 meters wide and 3.7 meters high for the house with a span of 8.5 meters.10.1 meters, and 3.2 meters above the normal water level.

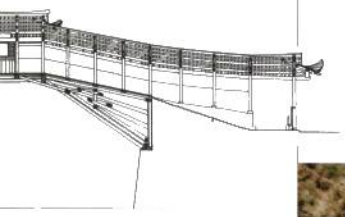
Qifeng Bridge, located in Waiyang Village of Wengshan Township and built in 1924, is a stone arch timber lounge bridge, 22.6 meters long, 4.4 meters wide and 4.4 meters high for the house with a span of 14.2 meters.

Qiaodi Bridge, located in Waiyang Village of Wengshan Township and first built in the Song Dynasty and rebuilt in 1929, is a stone arch timber lounge bridge with 3 lounge houses, 4.32 meters wide and 9 meters long, with a span of 3.3 meters, 4.5 meters wide for the house, and 2.3 meters above the water level.

Sanzhu Bridge, located in Xiawuyang Village of Sankui Town and built in a year

◎ 旗峰桥内神龛
Shrine in the Qifeng Bridge

◎ 旗峰桥(局部)
Qifeng Bridge (part)



unknown, is a timber beam lounge bridge with 7 lounge houses, where the crossing bracket type and the supporting beam type are mixed, with a overhanging gable roof. The surrounding environment of this bridge is beautiful, where creeks flow and trees flourish with broad and wide fields. The bridge is 15.4 meters in its total length, 4.5 meters wide with a span of 10.1 meters, and 3.2 meters above the normal water level.

Taifu Bridge (also known as Kengkou Bridge), located in Shangyang Village of Lingbei, is a stone arch timber lounge bridge, 27 meters in its total length, with a span of

◎ 旗峰桥
Qifeng Bridge

11 meters, 4.1 meters wide for the bridge floor and 5 meters for the arch, 5.8 meters between the bridge floor and the normal water level, and 4.8 meters high for the house.

Wenyang Bridge, located in Wenyang Village of Wengshan Township, first built in the winter of 1906 and rebuilt in 1940, is a stone arch timber lounge bridge, 10 meters long, 4.4 meters wide and 4.7 meters high for the house, and 3.5 meters between the bridge floor and the normal water level, with a span of 4.6 meters.

Wenchong Bridge, located at the end of Dongyang Village of Xiaocun Town, first

山间溪流
Creek among hills

旗峰桥
Qifeng Bridge

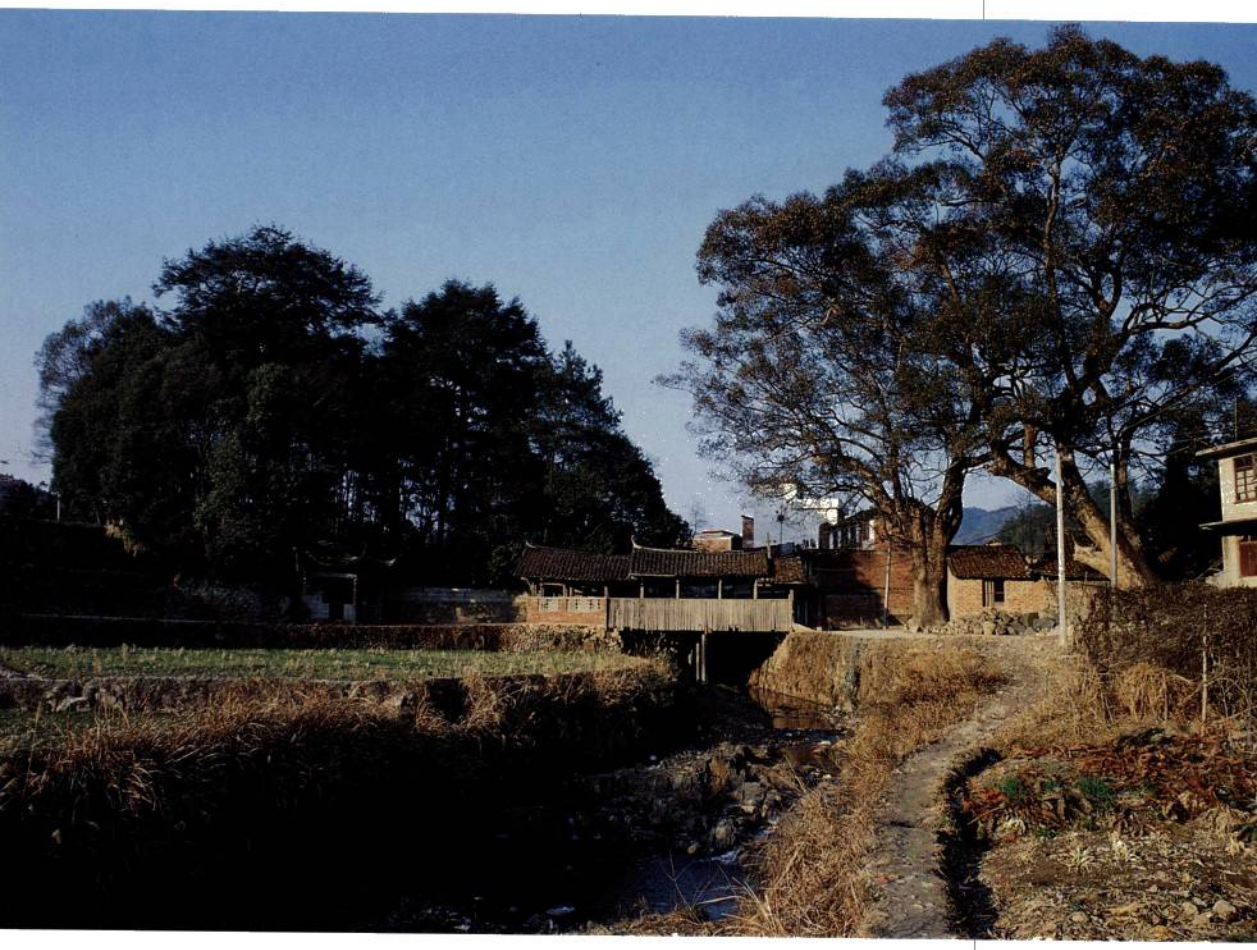
梧桐垟桥位于横坑乡梧桐垟，系石拱木廊桥，建造时间不详。石拱木廊桥，桥长9.4米，桥屋宽3.4米，桥屋高3.6米，拱券高4米，桥面宽3.8米，桥屋高3.6米，跨径6.6米。

霞庄桥原名望宵桥，系八字撑木拱廊桥，位于横坑乡霞庄村，咸丰二年（1852）次壬子阳月建造，同治七年（1868）9月17日重修，桥面宽4.4米，桥屋高4米，水面至桥面高4.5米，桥长23.5米，跨度11米，九开间，重檐式。霞庄桥的廊屋中设有神龛，内塑“五显”神像。[1]

三柱桥
Sanzhu Bridge

built in 1745 and rebuilt in 1921 after repeated destructions, is an piled cantilever timber beam lounge bridge, double-eaved gable and hip roof, bearing 11 lounge houses and 46 supporting pillars, 26.2 meters in its total length, 4.7 meters wide for the bridge floor, with a net span of 22.4 meters.

Wutongyang Bridge, located in Wutongyang Field of Hengkeng Township, built in a year unknown, is a stone arch timber lounge bridge, 9.4 meters long, 3.4 meters wide and 3.6 meters high for the house, 4 meters high for the arch, 3.8 meters wide for the bridge

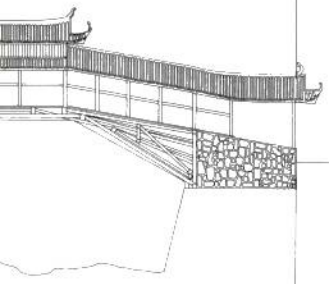


三柱桥
Sanzhu Bridge

泰福桥
Taifu Bridge

◎ 泰福桥内神龛
Shrine in Taifu Bridge

◎ 泰福桥
Taifu Bridge



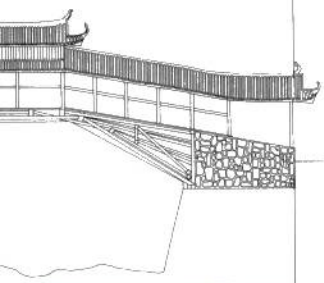
◎ 榅垟桥
Wenyang Bridge

◎ 在廊屋里嬉戏的村童
Village kids playing in the lounge house

文重桥
Wenchong Bridge

文重桥（内景）
Wenchong Bridge
(interior view)

文重桥
Wenchong Bridge



floor, with a span of 6.6 meters.

Xiaguang Bridge, located in Huayang Village of Hengkeng Township, built in 1723and rebuilt in 1852, is a stone arch timber lounge bridge with 7 lounge houses. Double-eaved, 17.3 meters long for the house, 4.4 meters wide for the bridge floor, 4.3 meters high for the house, 7.3 meters high for the arch, with a span of 13.2 meters. Xiaguang Bridge as a stone arch timber lounge bridge has a half-moon shaped stone archway above which are 7 lounge houses. They are equipped with wooden windbreaks and double eaves, with a plain roof and well-curved outline. The upturned eaves are slightly protruded and add to

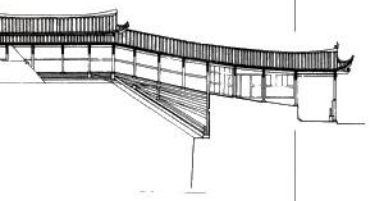
梧桐垟桥
Wutongyang Bridge

the house a certain sense of animation.

Xiazhuang Bridge (formerly known as Wangxiao Bridge), located in Xiazhuang Village of Hengkeng Township, built in 1852 and refurbished in 1868, is a timber arch lounge bridge supported by 2 pillars standing astride. The bridge has 9 lounge houses, double-eaved, 23.5 meters long, 4.4 meters wide for the bridge floor, 4 meters high for the house, 4.5 meters between the bridge floor and the water level, with a span of 11 meters. In the houses of the bridge rest some shrines where the idol of "Wuxian" stands.

霞光桥
Xiaguang Bridge

霞光桥
Xiaguang Bridge



泰顺古桥的分类和发展演变

Taishun Ancient Bridge: Its Classification and Development

泰顺县地处浙江省南部山区，古时是沟通浙闽两省政治经济文化往来的要道。复杂的地理环境及介于易受外来文化冲击的边缘地段，使得泰顺在吸收外来先进文化方面呈积极状态。它主要受到来自两个方面的影响：即来自闽北、闽东和浙南本土的两股力量，时有消长。因此，体现在吸收外来文化上就略显芜杂。文化杂交优势为泰顺古代桥梁的发展带来了繁荣，各种结构形式的桥梁都在泰顺生根开花。一种与科学史界过去一直认为失传的汴水虹桥的下部结构极其相似的木拱桥在泰顺就保存得非常完好，解放后的一次统计这类桥梁就有15座之多，至今尚余6.5座。山高、林密、溪多的地理条件和往来频繁的跨省经济文化交流，刺激了泰顺古代桥梁从唐以后走向了一条独具特色的发展道路。

泰顺县的民间桥梁不仅数量众多，而且其结构类型也多种多样。如前文所述，泰顺县的桥梁按结构类型可分为木拱桥、木平桥、石拱桥、石平桥等类型，再加上桥梁的初级形式之一的堤梁式桥，也即民间常说的矼步，一共有5种类型。

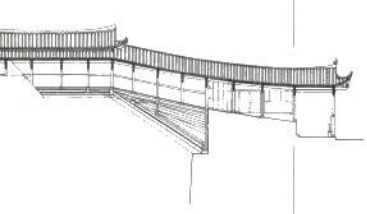
矼步是泰顺山区最常见到的原始桥梁。它的出现是山里人因地制宜地建设家园的结果。山区里的溪水常年流量并不大，但是山洪来时又异常凶猛，河床及河道的变化是无常的。聪明的山里人在大多情况下选择了矼步作为渡河的交通工具。矼步建造起来并不费时费事。但是矼步的坚固与耐久却无需怀疑。

泰顺早期建造矼步的年代没有确切记载。传说百丈镇的仁石矼步建造于唐代。三魁镇刘宅油车岭石板桥建造于宋政和八年，建桥原因是一个福州人过矼步被洪水卷走却幸运地被当地人搭救，其子为报恩而造。那么，原有矼步应先于宋政和八年存在。从现存矼步的历史和数量来看，唐以后建造矼步的风尚是沿袭了下来，且愈行愈盛。唐宋时一般将矼步造在溪水河床较窄的地段，到了明清以后则扩展到河床宽，水流缓，洪水季短，造木石梁桥或拱桥不易的河段。位于仕阳镇的仕水矼步就是清代建造的。

仕水矼步历史上曾多次修建，总之是修了毁，毁了再修。现存的矼步修建于清嘉庆年间，架设于仕阳镇溪东村一段平坦宽阔、水流平缓的河面上。全长133米，共223齿，一字凌波而立。齿形平整，每齿分高低两级，高者可供肩挑者或者是在涨水季节行走，低的也可容两人相向而行。整条矼步既可同时供三人并肩而行，又可叫人从容让步。其构思实在精巧，充

◎ 仕水矶步在仕阳镇溪东村，是连雪溪、三魁、万排、章坑诸乡的交通道口。
Shishui Block Bridge is located in Xidong Village of Shiyang Town as a traffic pivot which connects the villages of Xuexi, Sankui, Wanpai and Zhangkeng.

仕水矼步
Shishui Block Bridge



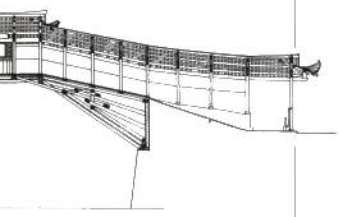
满意匠。建造者在选择矶步的石质上也颇费苦心：高的一级石质用白色花岗岩，低者用青石深砌。这种石质与颜色的不同搭配不仅使矶步外形优雅美观，更可使夜行者借星月微光而畅行无碍，甚至洪水初涨，踏浪而行的人们亦能安然渡岸。立于岸边的清乾隆六十年《重修仕水矶埠序》有曰："石取其坚，计永年也；色取其白，昭利涉也。"

木拱桥（泰顺当地俗称蜈蚣桥）：泰顺全县现存六座半，分别是泗溪镇的溪东桥、北涧桥，三魁镇的薛宅桥，仙稔乡的仙居桥，洲岭乡的三条桥，还有筱村镇的文兴桥，那座与邻省寿宁县共同拥有的红军桥，解放后为纪念红军曾在此渡河突围所修，其余皆建于明清两代。木拱桥的学名应当叫作"编木拱桥"或"编木拱梁桥"，前者也就是北宋名画《清明上河图》中蜚声中外的"虹桥"的同一结构形式，后者则是浙闽山区木拱桥的相同结构。

三条桥是泰顺历史最久的木拱桥，位于垟溪、洲岭二乡交界的横溪上，邻界闽省寿宁县，是泰顺南去福安的必经之处。据说此桥最早曾用三条巨木跨溪为桥，故名三条桥。今桥沿用旧名，"系道光二十三年（1843）里人苏某独立重建"，长32米，宽3.96米，高9.55米，单孔跨径21.26米，桥屋11

◎ 矶步有 223 齿，全长 133 米，石齿长 1.78 米，宽 0.24 米，露出滩面 0.7 米，齿距 0.6 米，齿由高低两级组成，行人可互相让路。高级长 1 米，采用斑白色花岗岩，低级 0.78 米，全部为青石。矶步形如一字，齿形平整，是泰顺地区最长、最好的矶步。

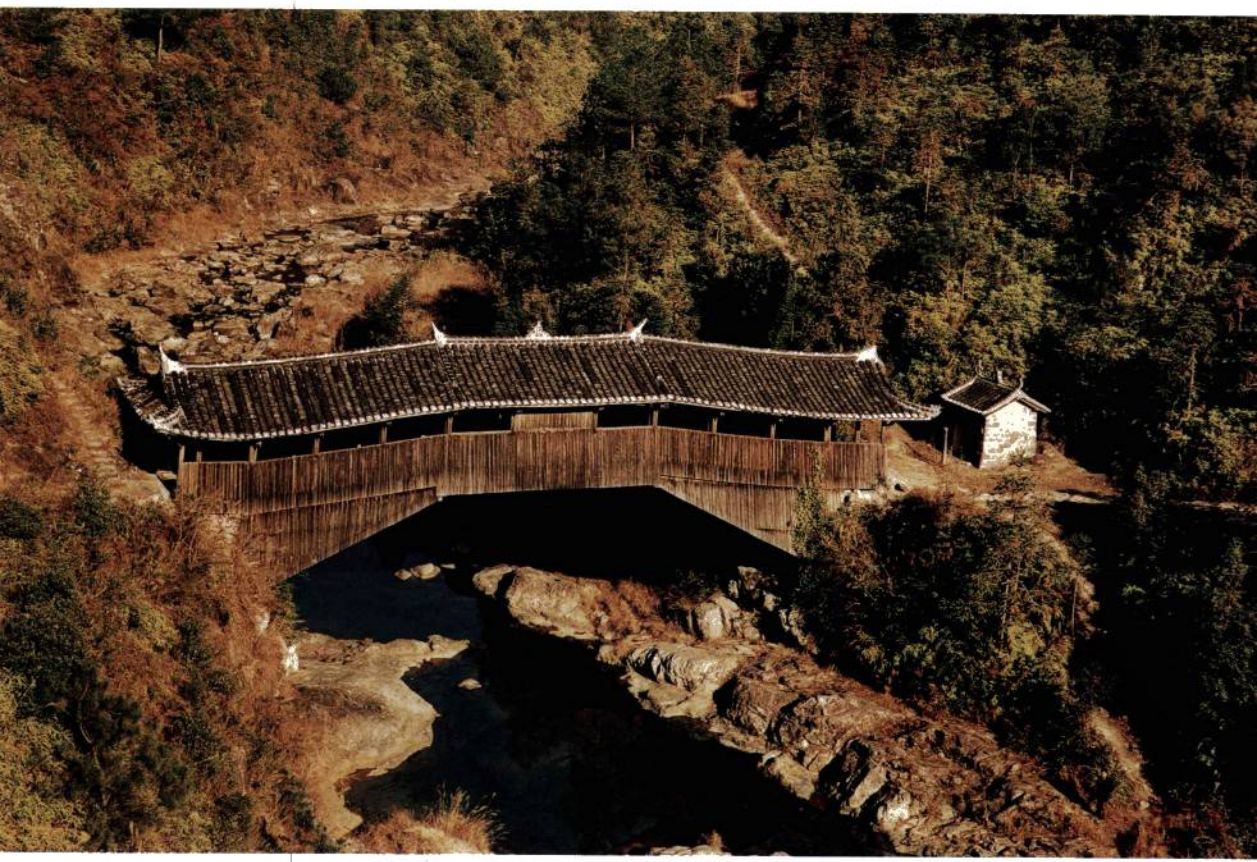
The block bridge is 133 meters long with 223 steps, each 1.78 meters long and 0.24 meters wide, 0.7 meters above the shore and 0.6 meters between two steps, one higher than the other, whereby passers-by may step aside to give way to the other. The higher step is 1 meter long and made of spotted white granite, and the lower step is 0.78 meter long and made of bluestone. This block bridge runs straight ahead with steps on a plain level, ranking the longest and best block bridge in Taishun area.



间，单檐，形态古朴优美。

仙居桥距县城20里，在仙稔乡仙居村水尾，扼温州大路要冲，今泰景公路通过桥畔。该桥有桥屋19间，80柱，单檐，长41.83米，宽4.89米，高12.6米，跨径34.14米，是泰顺现存的木拱桥中跨径最大的一座。它是由泰顺首任知县四川人郭显宗建成于明景泰四年（1452），清康熙十二年（1673）重建。

薛宅桥旧名锦溪桥，亦称营岗店桥，位于三魁镇营岗店街头，长51米，宽5.2米，高10.5米，单跨29米，桥屋15间，64柱，两头有石级连接大路，此桥拱架的斜跨梁长且斜度大，桥面两头的坡度达30度，飞檐腾空，宛如长虹。此桥由薛氏一族建于明正德七年（1512），清咸丰七年（1857）重建。



三条桥
Santiao Bridge

Taishun is located among the southern hills of Zhejiang Province, and served as a passage of political and economic significance between Zhejiang and Fujian Provinces in the ancient times. Its complex geographical conditions made it easier to receive the incoming cultural influences from abroad, and promoted its absorption of foreign and advanced cultures. The combination of different cultures had brought to Taishun the prosperity in construction of ancient bridges where various structural forms of bridges had developed.

The folk bridges in Taishun feature not only in their large number but also in their multiple types of structure. They may be divided by types of structure into timber arch bridge, timber beam bridge, stone arch bridge, stone beam bridge and many other types. The dyke type, i.e. "block bridge (ding bu)" according to the folks, may be added to the category as one of the primitive forms of bridge, making a total of 5 types of bridges.

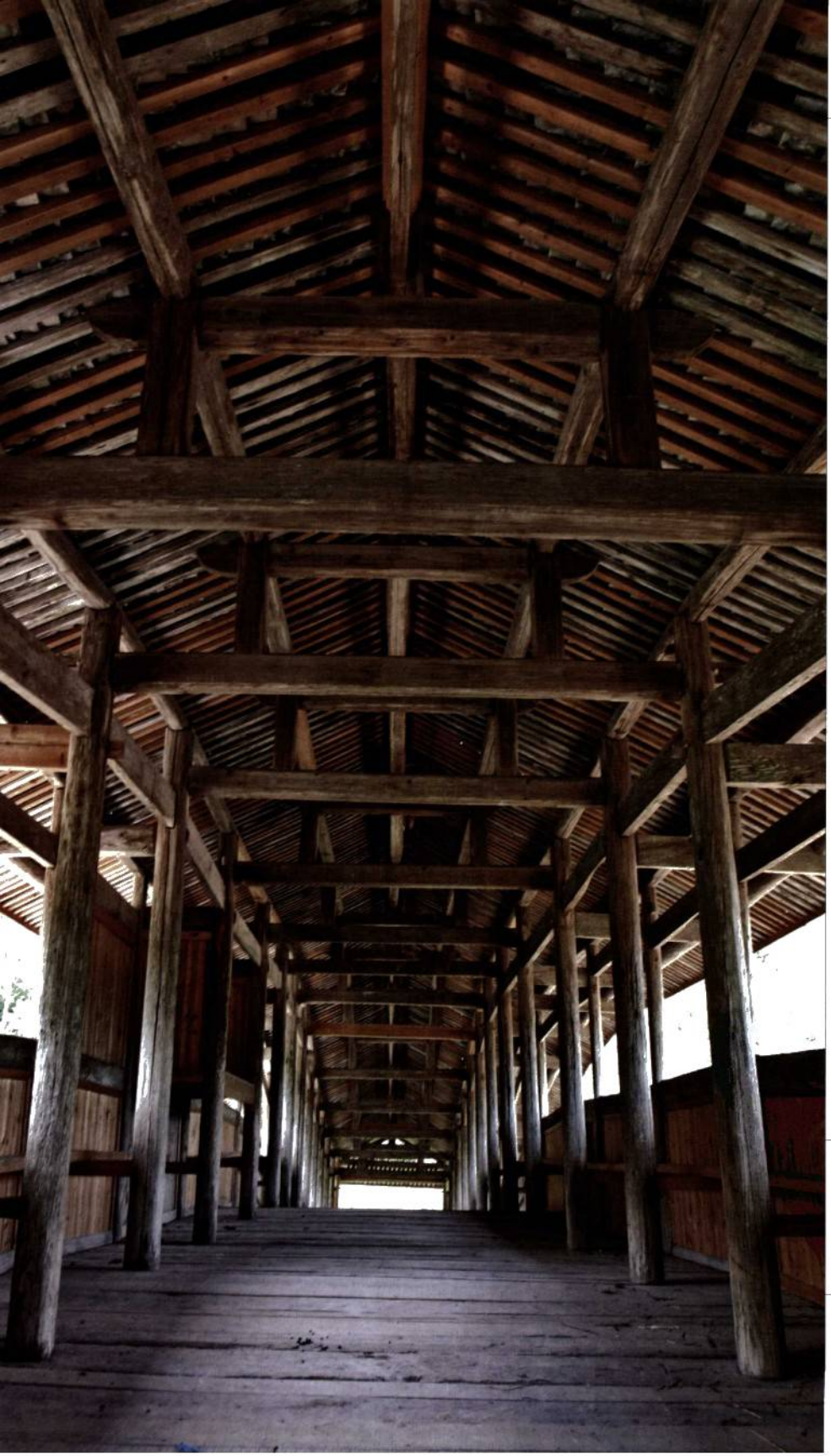
The block bridge is the most common and primitive form in Taishun mountainous area. It is the brainchild of the folk people making best use of the conditions available to them in constructing their hometown. The creek flows gently during a year but may in a flush when a flood arrives, so the river courses are changeable. The folk people invented bridges of the dyke type as a means of crossing the creek for most of the time, because the dyke type is both economical in time and money in construction, and is sustainable from flood. Its firmness and durability is beyond doubt.

The timber arch bridge (locally called Centipede Bridge): There remain six and a half bridges of the type throughout Taishun County, i.e. Xidong Bridge and Beijian Bridge in Sixi Town, Xuezhai Bridge in Sankui Town, Xianju Bridge in Xianren Township, Santiao Bridge in Zhouling Township and Wenxing Bridge in Xiaocun Town; except the Red Army Bridge which connects Shouning County of the neighboring province and was built in 1954 commemoration of the Red Army battling across it during 1937, the remaining bridges were built in either Ming or Qing Dynasty. Timber arch bridge has an academic name of "Woven Timber Arch Bridge" and "Woven Timber Arch-beam Bridge", the same structure as the world-famous "Rainbow Bridge" appearing in the picture of "Festival of Pure Brightness on the River" of the Song Dynasty.

Santiao Bridge, built over Hengxi Creek at the connecting point of Yangxi Township and Zhouling Township and next to Shouning County of Fujian Province, is the oldest timber arch bridge in the history of Taishun, and the only path from Taishun to Fuan County in the south. It is said that this bridge was first built with three large logs and that is why it is called "Santiao" (meaning "three logs" in Chinese). This name is still used and "it was constructed independently by Mr. Su, a local villager, in 1843". The bridge is elegant in the ancient style, and has 11 lounge houses with a single-eaved roof, 32 meters long, 3.96 meters wide, 9.55 meters high, with the span of a single opening of 21.26 meters.

仙居桥
Xianju Bridge

仙居桥
Xianju Bridge



◎ 仙居桥（内景）
Xianju Bridge
(interior views)

文兴桥在篾村乡坑边村村尾，北通洪口、莒江，南去夏卢、三魁、泗溪，桥长46.2米，宽5米，高11.5米，单跨29.6米。桥屋19间76柱，中央有重檐楼阁。该桥创建于清咸丰七年（1857）。桥面中部呈畸形，一头略高。

木平桥是泰顺古桥类型之一，全县现存22座，以刘宅桥年代最古。

薛宅桥
Xuezhai Bridge

Xianju Bridge is located at the end of Xianju Village of Xianren Township, 20 li away from the central town, and stands in the way to Wenzhou, and now Taijing Highway runs past it. The bridge has 19 lounge houses and 80 pillars with a single-eaved roof, 41.83 meters long, 4.89 meters wide, 12.6 meters high with a span of 34.14 meters, and it is the

廊屋内的神龛
Shrine in the Bridge House

薛宅桥
Xuezhai Bridge

timber arch bridge now existing in Taishun with the longest span. Its builder was Guo Xianzong from Sichuan, the first county head of Taishun, in 1452 in the Ming Dynasty. It rebuilt in 1673 of Qing Dynasty.

Xuezhai Bridge, formerly known as Jingxi Bridge or Yinggangdian Bridge, built in 1512 in the Ming Dynasty and rebuilt in 1857 in the Qing Dynasty,located at the end of Yinggangdian Street of Sankui Town, is 51 meters long, 5.2 meters wide, 10.5 meters high, with a single span of 29 meters, with 15 lounge houses and 64 pillars, each end having stone steps leading to the avenue; as the beam of its arch frame is too long and inclined, the slope angle of either end of the bridge is 30 degrees, looking like a rainbow.

Wenxing Bridge, first built in 1857 of Qing Dynasty, and located at the end of Kengbian Village of Xiaocun Township, leading to Hongkou Jujiang in the north and to Sankui, Sixi, Xialu in the south, is 46.2 meters long, 5 meters wide, 11.5 meters high, with a single span of 29.6 meters, with 19 lounge houses and 76 pillars; it has a double-eaved roof pavilion in the middle. It is abnormal in shape in the middle, where one end is a bit higher than the other.

◎ 薛宅桥上舞狮
Lion Dance On the Xuezhai Bridge

文兴桥
Wenxing Bridge

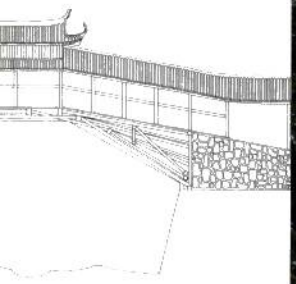
The timber beam bridge is one of the ancient types of bridges in Taishun, and there remain only 22 bridges of the type in the whole county, among which Liuzhai Bridge is the oldest one.

Liuzhai Bridge, formerly known as Xiandonghong Bridge, first built in 1405 in the Ming Dynasty and located at the end of Liuzhai Village of Sankui Town, is one of the most exquisite in shape among many multi-house timber beam bridges. It was refurbished three times and remains the way it was. It is 18.4 meters long, 6.25 meters wide with a span of 10.5 meters, and used to serve as a pivotal place between Taishun and Fuding before a highway appeared. It has a special shape with 6 lounge houses and 45 pillars, all the column bases of which are made of timber. The houses and the wings on both sides are two-floored.

Dengyun Bridge, formerly known as Zhennan Bridge or informally called the New Bridge, located to the south of the County Gate, is an important bridge for entry into the County from southwest of Taishun or for travel to Shouning from the County. On the beam at the entrance of the bridge used to be affixed a board with the inscription by Dong Fu, a scholar in Luoyang in the Ming Dynasty, which reads the "First Pass in the South of the Town". This bridge is 39.5 meters long, 5.35 meters wide and 5.52 meters high, with a span of 24.6 meters between the two openings. The piers of the bridge are constructed by coarse stone material with two layers of overhanging beams placed longitudinally,

◎ 文兴桥
Wenxing Bridge

文兴桥
Wenxing Bridge



刘宅桥（内景）
Liuzhai Bridge (interior view)

刘宅桥
Liuzhai Bridge

刘宅桥
Liuzhai Bridge

刘宅桥坐落在三魁镇刘宅村水尾，本名仙洞虹桥，建于明永乐三年（1405）。它是泰顺众多屋式木平桥中造型最为精巧别致的一座。先后经历三次大修，模样依旧。桥长18.4米，宽6.25米，跨径10.5米。该桥地当要冲，在未有公路前，是泰顺往来福鼎必经之津梁。桥屋的形制很丰富，计6间45柱，支撑柱子的磉子全系木质。桥屋及两头厢房都建成二层楼屋。

登云桥原名镇南桥，俗称新桥，位于县城南门，是泰西南区进城及县城通往寿宁的重要桥梁。在桥头入口的横楣上，原有罗阳明儒董孚题的“城南第一关”匾额。桥长39.5米，宽5.35米，高5.52米，二孔跨径共24.6米。桥墩用粗料石干砌，墩上纵置二层伸臂短梁，层层向两边出挑约一米，两孔各用直径三十多厘米粗的杉木梁，12支并排，联成一体，横跨溪面。梁上铺厚实的行道桥板，桥屋有12间82柱，两边设座，座外柱间为一米多高的栏板，栏板外再加挡风板，风板比栏板高出一米多，以避风雨。全桥单檐成一字形，为明正德年间（1506—1521）知县刘桐主持修建，万历年间（1573—1619）署县通判车登云重建。现名“登云桥”即出于此。

仙居桥畔
Xianju Bridge

镇东桥在县城东门，原为石板桥，建于明隆庆四年（1549），后改为屋式木平桥，是昔日温州大道与桐山大路必经之桥。与今泰顺至分水关公路桥平行，间隔仅一米。桥长13米，宽4.9米，高4.3米，跨径6.2米，桥屋5间24柱，单檐屋面。

永庆桥在戴州乡下溪坪，是全县屋式木平桥中造型较为优美又规模最大的古廊桥。桥长36米，宽5米，高5.2米，二孔跨径19.12米，桥墩为粗料石干砌，迎水一侧筑分水尖，墩上置三层伸臂梁，下层为石质，上二层为木质，递向左右挑出，上层臂长2.7米，桥屋12间，共64柱，中部起重楼，楼上有神龛，供神像。桥屋两侧有1.4米高的栏板，外加风雨板，其下端盖住跨梁，屋顶飞檐翘角，形似欲飞。该桥系清嘉庆二年（1797）建造。

石平桥（石板桥）：全县共有349座，其数量仅次于石拱桥。在刘宅村的附近还有目前泰顺最古老的清石桥——油车岭石板桥，石板桥建于北宋政和八年。

石拱桥是泰顺的主要桥梁类型，历史悠久，数量是所有桥梁中最多的。毓文桥和回澜桥可为其中的杰出代表。

毓文桥在洲岭乡州边村水尾。位于两山豁口处，是别具风格的石拱木廊桥，长22.9米，宽4.15米。单跨7.6米，桥上木屋7间32柱，有三层楼阁，皆飞檐翘角，下层两首在纵横上竖起二小阁，横脊与纵檐成垂直的工字形。二楼为文昌阁，原有文昌帝君塑像。三楼呈正方形，中央有葫芦状尖顶，体态匀称、别致。该桥建于清道光十九年（1839）。

with each layer exceeding the other by 1 meter; the two openings of the bridge are supported with 12 rows of fir beams jointly arranged over the river, each of which has a diameter of over 30cm. On the beam are paved with solid steps, and 12 lounge houses are built with 82 pillars, where seats are arranged on both sides, between whose pillars outside these houses are installed the boards of more than 1 meter high, protected by the windbreakers of 1 meter higher than the boards, so as to keep the houses away from wind and rain. This single-eaved bridge, arranged in the linear form, was built between 1506 and 1521 in the Ming Dynasty under the presidency of Liu Tong, the County head, and rebuilt between 1573 and 1619 in the Ming Dynasty under the presidency of Che Dengyun, a local officer. That was how the present name of the bridge came into use.

Zhendong Bridge, located at the East Gate of the County and formerly a stone bridge, was built in 1549 in the Ming Dynasty but rebuilt as a timber bridge with lounge houses. It used to be a pivotal place between Wenzhou Avenue and Tongshan Road, and is parallel with the highway bridge between Taishun and Fenshuiguan, only 1 meter in between. This single-eaved bridge is 13 meters long, 4.9 meters wide, 4.3 meters high, with a span of 6.2 meters, with 5 lounge houses and 24 pillars.

Yongqing Bridge, located at Xiaxiping of Zhangzhou Township, is one of the beautifully shaped ancient lounge bridges of the timber beam type with houses in the whole County. It is 36 meters long, 5 meters wide, 5.2 meters high, with a span of 19.12 meters

◎ 永庆桥（内景）
Yongqing Bridge
(interior view)

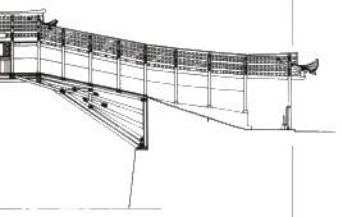
永庆桥
Yongqing Bridge

between the two openings. The piers of the bridge are constructed by coarse stone material, and on the side facing the water flow is constructed a splitter wall with three layers of overhanging beams, with the lower layer being stone and the two upper layers being timber, upper layer reaching out for 2.7 meters, with 12 lounge houses and 64 pillars; houses of multiple floors are built where in the middle rest the shrines for idols. On both sides of the houses are installed the boards of 1.4 meters high, protected by the windbreakers, the lower parts of which cover the spanning beam. The protruding roof of the house looks like a bird reaching out its wings. This bridge was built in 1797 in the Qing Dynasty.

◎ 毓文桥
Yuwen Bridge

Stone Beam Bridge: There are 349 stone bridges in the County, second in number only to that of stone arch bridges. But near Liuzhai Village there exists the most ancient bluestone bridge now in Taishun, Youcheling Stone Bridge, which was built in 1118 of the Northern Song Dynasty.

The stone arch bridge is one of the chief types of bridge in Taishun with a long history and ranks first in number. Yuwen Bridge and Huilan Bridge are two of the outstanding representatives.



回澜桥是三墩四孔的石拱桥，长85米，宽6米，在司前镇。桥体敦实厚重，砌石精细。桥上两侧石栏杆柱头雕刻成狮子、荷花和蟠桃等瑞兽祥物。大桥两端各建一亭，作为施茶憩息的场所（现已毁）。司前古名池村。池村在古代是浙南关塞要地，北接处州（今丽水），南连县城罗阳，东沿飞云江可直通温州。明朝政府曾在此设立巡检司，司前由此得名。回澜桥从公元1848年开始建造，最后于公元1876年竣工。

泰顺桥梁自唐以来，历经数朝，时越千载，虽地处僻壤穷乡，但一脉相袭久而不衰，这不能不说是一个奇迹。仔细考察泰顺历代桥梁，你也许会探寻到发生这个奇迹的原因。

一是因地制宜，因势就利。泰顺是一个纯粹的山区，木材资源丰富，一般山流溪涧跨度不大，木材的结构性能正适宜造如此跨度的桥梁。有一些溪流河床过宽而水又不深的地段则用矶步。跨度适中，水深流湍或便于山区放筏不宜造桥墩的则用编木拱梁桥或伸臂梁桥，这样就不自觉地丰富了泰顺桥梁的类型。

二是兼收并蓄，取长补短。地处浙闽边境有利的地理位置使它能吸收来自多方面的造桥文化，更便于造桥工匠间跨省际的相互往来，交流各自所在地的造桥经验和技术。如在福建省的寿宁，福安南屏和浙江省的云和、景宁都是与泰顺毗邻的县。正是南方编木拱梁桥最为发达集中的地区，这也反映出当时工匠间的往来是频繁的，交流的技术、经验亦是丰富的。长江下游地区在拱桥中用的桥墩多为薄墩，泰顺却多用厚墩，这是与泰顺山区雨季多爆发山洪的情况相适应的。泰顺的木桥普遍建造桥屋，这样做一是为了增加桥身的重量，以防止烈风洪水的袭击，再者也可避免雨水对木结构的腐蚀；三还可以给行人歇脚小憩，一举数得。在只能依靠双脚行走的时代，在泰顺山区赶路往往十几里还前不着村，后不着店，因而桥屋的设置更是必需。桥屋内往往设有两排固定的木凳供人休息，木凳的外侧有的做成美人靠。有些桥屋的二层还可以供行人住宿，这样桥梁能在人来人往中得到更好的保护。

第三，建造桥梁具有广泛的社会性和良好的群众基础。泰顺修造桥梁的方式有民建，同姓家族合建，个人独建等，如司前的回澜桥、泗溪的溪东桥、北涧桥等。其次是募捐集资，如何公桥、桂峰桥等。再者是官倡民修或是全由官方建造。自古以来，修桥铺路都是公益善举，也更是地方官吏的职责所在，这些社会的合力共同推动了泰顺桥梁的健康发展。在山道弯弯，溪流阻隔的艰难泰顺旅程中，桥梁无疑唱的是主角。[2]

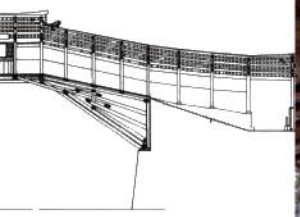
远眺毓文桥
Yuwen Bridge viewed from afar

毓文桥
Yuwen Bridge

Yuwen Bridge, located at the end of Zhoubian Village of Zhouling Township, between the two cracks of two hills, is a stone arch and timber house bridge with special features. It is 22.9 meters long, 4.15 meters wide, with a single span of 7.6 meters, with 7 lounge houses and 32 pillars. The three floors of houses have protruding roofs with the two lower houses lying crosswise, where the horizontal beam and the vertical eave constitute a crisscross structure. The second floor used to be the Wenchang Pavilion, where rests the Emperor of Wenchang, a legendary person in charge of human knowledge. The third floor is square, with a roof in the shape of a well-proportioned calabash. This bridge was built in 1839.

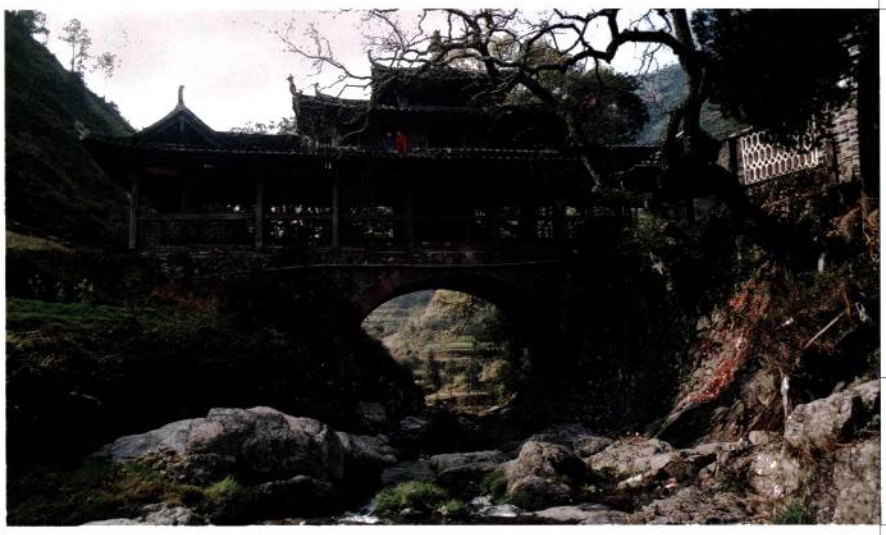
Huilan Bridge located in Siqian Town is a stone arch bridge with three piers and four openings, 85 meters long and 6 meters wide. The construction is solidly built and exquisitely constructed. The column caps of the stone railings on both sides are carved in the shapes of such auspicious animals or objects as lions, lotus flowers and peaches of longevity. A pavilion is built on either side of the bridge as a resting-place for a tea (now deteriorated). The ancient name for Siqian (literally meaning facing a "Si" i.e. an office) Town is Chicun Village, which was a pivotal place in the south of Zhejiang, connecting Chuzhou (now Lishui) in the north and Luoyang in the south, leading to Wenzhou along Feiyun River in the east. An inspection office (i.e. "Si") was established here in the Ming Dynasty and that is how the present name came into use.

It may be said to be a miracle that the bridges in Taishun have been successfully handed down for generations for over 1000 years since Tang Dynasty, irrespective of the remoteness of its geographical position. You may find the reasons for it when you look



◎ 毓文桥（内景）
Yuwen Bridge
(interior view)

◎ 毓文桥
Yuwen Bridge



◎ 毓文桥
Yuwen Bridge

into the bridges over the long history – First, they were built on the basis of their local conditions available. The timber resources abound in Taishun County because it lies among pure mountains, and in many cases the span of a river is not very wide, and the performance of timber is proper for building bridges with such a span. For some places where the river course is wide but water flow is shallow, a block bridge is applicable. In other places where the span is moderately wide but the water flow is deep and speedy, and it is suitable for rafting but improper for placing bridge piers, the woven timber arch-beam bridge or the overhanging beam bridge is applicable, thus naturally enriching the types of bridges in Taishun. Second, they incorporated various advantages from other regions. The advantageous geographical position of Zhejian-Fujian region made it possible to absorb various advantages from different regions, and for bridge builders to communicate their experience across the provinces. Shouning, Fuan and Nanping of Fujian Province and Yunhe and Jingning of Zhejiang Province, for example, are the bordering counties of Taishun, and also the places where the woven timber arch-beam bridge in Southern China gathered and developed rapidly. That tells us that the communication between the builders was frequent and the technical experience in such communication was rich. The arch bridges in the lower reaches of the Yangtze River are mostly equipped with thinner piers, whereas the bridges in Taishun with thicker ones, which is appropriate for the fact that mountain torrents often erupt in rainy seasons in Taishun mountainous region. The timber bridges were popularly built with houses, which add more weight to the bridge body so as to prevent the attacks from the winds and torrents and to avoid rainwater from eroding the timber structure. They also serve as a resting-place fortravelers.

【注释】
①参见《泰顺廊桥网》薛一泉撰 “泰顺廊桥”一文。
②参见高启新撰“浙南泰顺古代桥梁发展阶段性初探”，《泰顺县修志通讯》，1997年版。

著名的虹桥——木拱廊桥

A Famous Rainbow Bridge: Timber Arch Lounge Bridge

木拱廊桥的历史

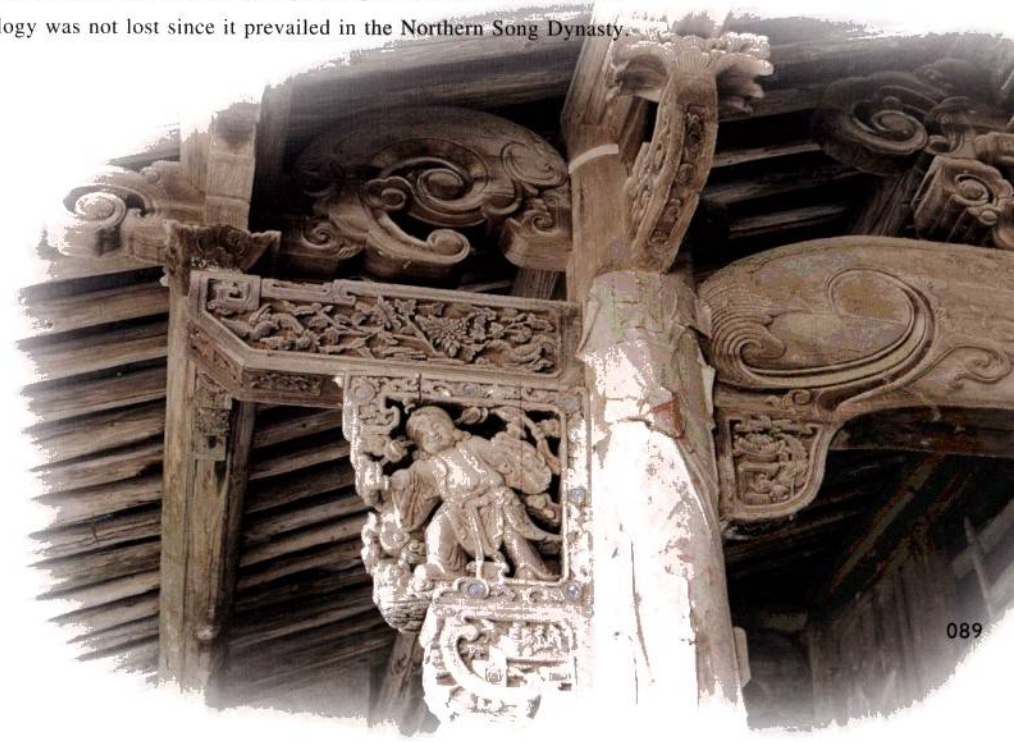
History of Timber Arch Lounge Bridge

这里所言“虹桥”是用其狭义，指由直木穿插别压编织组合而成的曲形拱桥，“即在世界桥梁史中绝无仅有的木拱桥”[①]，与广义的包含各类造型呈弧形的石木拱桥统称的虹桥在结构上有极大差别。现存图像资料中，最早见之于北宋著名画师张择端[②]的旷世杰作——《清明上河图》中。也即是说，虹桥结构最迟出现在北宋王朝的宣和年间（1119—1125）。最早名之曰“虹桥”的先哲，我们至今还没法考证，但从现存的文献来看，宋孟元老之《东京梦华录》是较早称呼其为虹桥的一部重要史籍。

《东京梦华录》里有这样描写汴水的几段文字：“自西京洛口分水入京城，

Compared with its meaning in the narrow sense, which means a curve-shaped bridge constructed by weaving straight logs crisscross together, a "rainbow bridge" used herein has a wide difference in structure from those in the broad sense, which include all types of stone or timber arch rainbow bridge however in the shape of an arc. The rainbow bridge first appeared in China, according to the documentation available now, in the world-famous painting of "*Festival of Pure Brightness on the River*" produced by Zhang Zeduan in the Song Dynasty. In other words, the rain bow structure appeared in China at the latest between 1119 and 1125 in the Northern Song Dynasty.

In the 1970s, workers in cultural relics found the timber arch lounge bridges similar to the rainbow structure in Wenzhou and Lishui mountainous regions in the southwest of Zhejiang Province for the first time. The second session of the editing meeting for the Chinese History of Ancient Bridge Technology (Mao Yisheng as its editor-in-chief) was held in Beijing in November 1979, and one of the reports represented on the meeting was concerning the Combined Beam-arch (i.e. the previous denomination for rainbow bridge structure by Mr. Tang Huancheng before the denomination of Woven Timber Arch Bridge). The third session of the editing meeting was held in Hangzhou in October 1980, after which some of the attendees made investigations into the timber arch bridges in the south of Zhejiang Province. Later, the researchers in cultural relics and bridges consecutively found the timber arch lounge bridges in the mountainous region in the northeast of Fujian Province, which are substantially the same type as those in the mountainous region in the southwest of Zhejiang Province. It was then that bridge experts began to believe that the rainbow bridge technology was not lost since it prevailed in the Northern Song Dynasty.



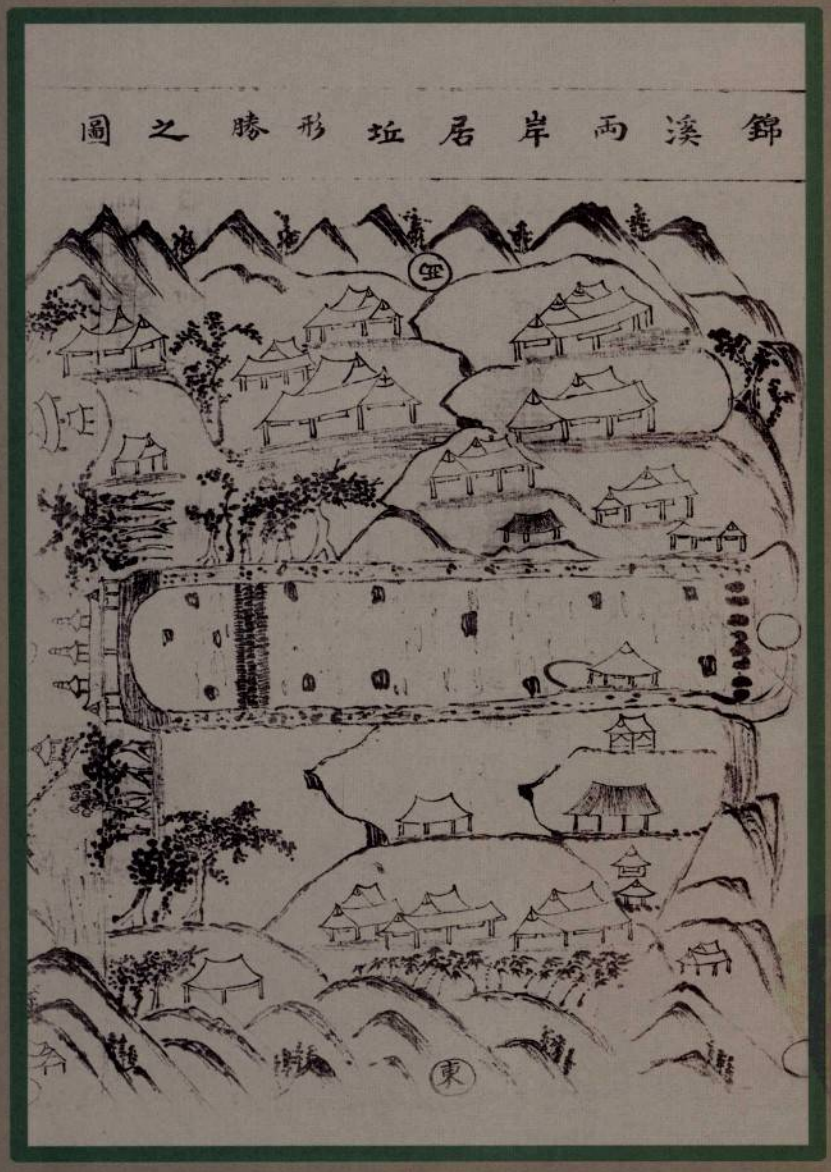
清明上河图（局部）
Festival of Pure Brightness on the River (part)

东去至泗州入淮，运东南之粮，凡东南方物，由此入京城，公私仰给焉。”再有“东城一边，其门有四，东南曰东水门，乃汴河下流水门也”。又说“自东水门外七里，至西水门外，河上有桥十三。自东水门外七里，曰虹桥。其桥无柱，皆以巨木虚架，饰以丹艧，宛如长虹，其上下土桥亦如之。次曰顺成仓桥。入水门里曰便桥，次曰下土桥，次曰上土桥……”[3]由此看来，在孟元老撰作《东京梦华录》的时候汴京早已有了虹桥的称谓，并且“虹桥结构”并不只是虹桥独有，“其上下土桥亦如之”。张择端将汴水上结构相同的虹桥、上土桥和下土桥概括为一，画出了流传千古的虹桥。可见，虹桥结构在宋朝时的汴京是比较普及的一种桥梁结构形式。

也许有人会问，为什么当时早已成熟的石拱技术不被采纳，而一定要用木拱桥呢？况且，石拱要比木拱更加坚固耐久。西京洛阳早在晋太康三年（282）就曾建造可容大舟通行的石拱桥——旅人桥，而当水陆要冲的河北赵县于隋大业初年（605）就建成了由名匠李春主持设计的古代中国石拱净跨最大的安济桥（净跨度达37.02米）。其实，在北宋中叶时期，建造石拱桥比建木拱桥要费时耗工得多，连魏化基的无脚桥都因“三司度所废工逾三倍，乃请罢之”。另外更重要的是，建造中又需断航，而汴水为京城之命脉所系，漕运不可一日中断。因此由于种种机缘巧合，汴河虹桥得以处处推广采纳，这才被观察入微的画家摄入了图画中，也永远地载入了史册。

近世研究中国古桥技术史的学者大多认为虹桥技术自宋以后，在中国已失传了900余年。形成虹桥的木拱结构自青州问世以来，流传山西、河南等广大地区，湮没于汴水是否同时就等于在全国范围内失传了呢？中国别的地方还会存有《清明上河图》中所绘的虹桥吗？

20世纪70年代末，文物工作者率先在浙江西南部的温州丽水山区发现了类似虹桥结构的木拱廊桥。1979年11月，茅以升主编的《中国古桥技术史》第二次编写工作会议在北京召开，提交报告之一即是叠梁拱（编木拱桥名称出现前，唐寰澄先生对虹桥结构的称谓）——虹桥。1980年10月第三次编写工作会议在杭州召开，会后部分人员考察了浙南木拱桥。后来，文物和桥梁研究者又在闽东北山区陆续发现与浙西南山区基本为同一类型的木拱廊桥。至此，桥梁专家们才确认北宋盛行的虹桥技术并未失传。

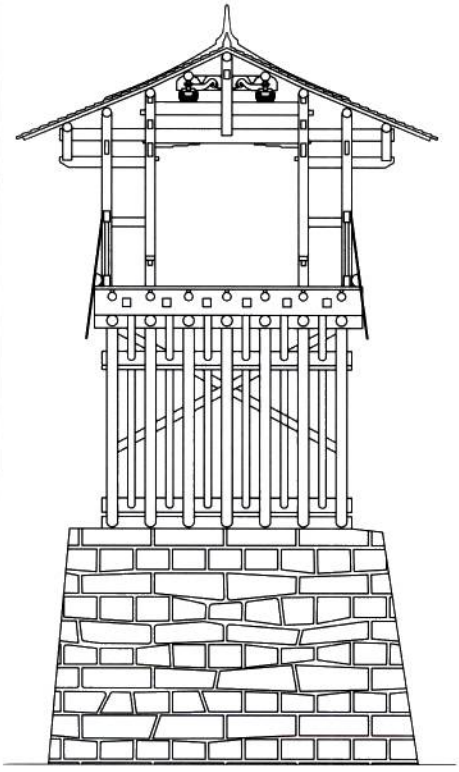


◎ 薛宅桥与锦溪两岸民居（此图绘于清乾隆十八年，摘自《薛氏宗谱》）。
Xuezhai Bridge and residential buildings along Jinxi River (painted in 1753, as copied from the *Genealogy of the Xue Family*)

木拱廊桥的结构特色

Structural Features of Timber Arch Lounge Bridge

虹桥结构的基本组合单元是六根杆件，纵向四根，横向两根，平面上呈“井”字形。由于桥是受压的，利用受压产生的摩擦力，构件之间就会越压越紧。这种结构，不用钉铆，只需用相同规格的杆件，别压穿插，编织而成。从力学上分析，上端的纵梁压在横梁上，横梁又压在相对一根纵梁上，相当于上下两根纵梁夹住一根横梁，因摩擦力的存在横梁不滑动，结构就不会破坏。这种结构，整体为拱形结构。因此沿拱心线整体受压，不会产生弯矩，就每一根杆件来说，又是最简单的简支梁，承受两种集中荷载。这种结构在泰顺的流传是利用了泰顺地处山区，多产林木的优势。桥的构件规格统一，无特殊、异形的构件，伐下的树木只需经少量人工即可制成合格构件。而且，装卸方便，拆桥时可以做到不损构件，构件可重复利用。小杆件便于运输，用小构件形成大跨度，经济合理。根据泗溪北涧桥桥头上石碑记录民众捐资的情况，在道光二十九年重修中，一共用去约 100 万文，这个造价在当时应该说是不太高的。



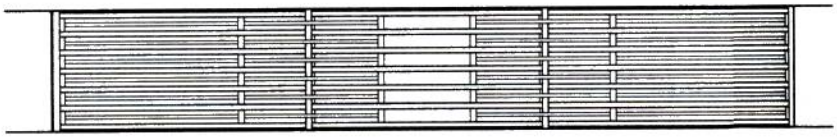
三条桥横剖面图
Transverse section of Santiao Bridge

虹桥结构有很好的受压性能，只要两个端部固定，桥就能很好地承受向下的荷载。但是，由于结构的特殊，桥受到向上的反弹力，就很容易失稳遭受破坏。为此，泰顺的虹桥都采用了廊桥这种形式，桥上建廊屋非但不是负担，反而增强了稳定性，真是绝妙之极。同时，廊桥这一形式也使桥身更为优美。它还是人们休息、交流、交易的场所，从形式到内涵，都极具艺术魅力与实用价值。有些年份，山洪爆发，水位高涨，桥随时都有遭冲毁的危险，当地的乡民们便从家中抬出一些厚实的家具，一一压在桥面上，以求廊桥安稳度汛。在泰顺，廊桥早已成为乡民生活场景中相当重要的一部分。

The basic units of the rainbow structure are six beam components, four arranged vertically and two horizontally, which constitute a square on a plane. As the bridge is subject to a pressure, the friction arising from such pressure will compress the components even closer. There is no use of rivets but beam components of the same specification are woven together crisscross. From the mechanical point of view, the vertical beams press on the horizontal beams, and likewise the horizontal beams press on the next vertical beams, which is in fact two beams holding one beam, and the friction makes them impossible to move or damage the structure. Its structure in general is an arch structure. The arch structure, subject to a pressure along the arch-core line, will not bend easily, and each beam unit bears double concentrated load as a simply supported beam . This prevailing structure makes use of the advantage in the mountainous region of Taishun where timber resources abound. The components for the bridge are uniform in specification, without any special or abnormal requirements for the components, so the logs being felled may become qualified components without much human work. It is easy to dismantle the bridge without damaging the components and possible to use them repeatedly. Smaller components are easy to be transported, and it is also economical and reasonable to construct a wide spanning bridge with smaller components.

The rainbow structure has a good pressure performance, for it may sustain any downward load properly when both ends are well fixed. But if the bridge receives an upward reaction, the balance may be easily destroyed. The rainbow bridges in Taishun therefore adopt the form of a lounge bridge by building houses on it, which is no burden in anyway to the bridge but a magic security for its stability. Furthermore, the form of a lounge bridge adds more beauty to the bridge body. It provides the travelers with a place for sitting, talking and trading, which make the bridge both beautiful and practical. In some years when mountain torrents erupted and water level increased, and the bridge was subject to destruction at any moment, the local villagers took out their heavy furniture onto the surface of the bridge and successfully secured the stability of the bridge over the disastrous period of mountain torrents.

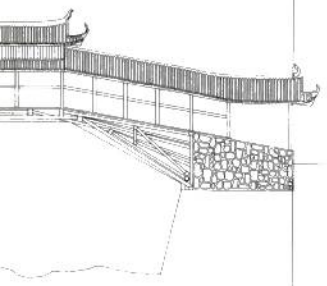
北涧桥
Beijian Bridge



三条桥桥底仰视平面图
Arch plan of Santiao Bridge

汴水虹桥和浙闽木拱廊桥差异及其演变

Differences and Development of Bianhe Rainbow Bridge and Zhejiang-Fujian Timber Arch Lounge Bridges



经后世专家50多年的历史文献和实地考察研究，同时向中外介绍和宣传。今天，《清明上河图》中的汴水虹桥和现在尚存的浙闽木拱廊桥渐已闻名。上述两个名称是对两类桥梁总体的、主要是建筑学特点的描述，对它们最具特色的、特殊的下部承重结构也早应有准确的、完整的和响亮的名称来描述。遗憾的是，由于深入系统研究虹桥结构的专家很少，此方面的论文和专著也不多，加上其他客观原因，迄今为止尚未有比较准确而科学的名称对以上两种桥梁结构进行命名。

在茅以升主编的，由北京出版社出版于1986年5月的《中国古桥技术史》一书中，对两类桥梁结构作了详尽描述，并用“拱式木桥”（第102页）和“虹桥式木拱桥”（第106页）分别称呼汴水虹桥和木拱廊桥的下部结构。这是中国近世学者在权威著作中第一次对虹桥结构进行系统研究并初步对其进行概括归类。

在唐寰澄编著的，由文物出版社出版于1987年3月的《中国古代桥梁》一书中，将两种桥梁结构同称为“叠梁拱”（第64页），英文译作“Combined Beam-arch Bridges”（第265页），书中还解释说：“介于梁与拱之间的木桥，作者姑名之为叠梁拱桥，可以宋代《清明上河图》上的汴水虹桥为代表。”这是中国近世学者第一次将虹桥桥式的下部结构明确地给予命名，它代表着中国学者对虹桥研究的一个阶段性成果。但是，“叠梁”两字在中国古代建筑中有特别的含意，是指木梁纵横交错、层层相叠，房屋或桥梁结构中较多运用叠梁的方式层层出挑，以求更多更大的空间或跨度。这种叠梁结构在建筑上运用较早，在秦汉时期的青铜器或画像石砖上就有所刻画。用“叠梁拱”来称呼虹桥的下部结构极易与上文提到的“伸臂木梁桥”的结构相混淆，因为后者的“伸臂”正是通过叠梁的方式来形成的。其实，作者唐寰澄先生当时也觉得并不妥，故在书中用了“姑名之为叠梁拱桥”的话语。

原华侨大学建筑系教授方拥先生在1995年11月发表在《建筑学报》上的“虹桥考”一文中，也是引用的唐寰澄先生命名的“叠梁拱”（第57页）一词。

在2000年1月由科学出版社出版，唐寰澄著的《中国科学技术史·桥梁卷》中，汴水虹桥的结构又被称为“贯木拱桥”（第461页），“贯木”取自《渑水燕谈录》中“取巨木数十相贯”一句描述虹桥建造的文字。客观地讲，用“贯木”二字要比“叠梁”准确，并有古文献为据，但是“贯木拱”却有较多的模糊性，

溪东桥
Xidong Bridge

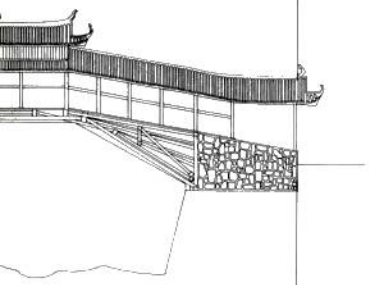
After over 50 years of study of the historical documentation and site inspection by modern experts, as well as the publicizing to both domestic and foreign readers, both Bianhe Rainbow Bridge appearing in the painting of "*Festival of Pure Brightness on the River*" and the timber arch lounge bridges in Zhejiang-Fujian region are well-known. The above two denominations are the general descriptions of the two types of bridges, chiefly of their architectural features, and there should have been accurate, complete and resonant denominations for their lower supporting structures, which are specific and special.

In the book with the title of *Chinese History of Ancient Bridge Technology* (Mao Yisheng as its editor-in-chief) published by Beijing Publishing House in May 1986, the structures of these two types of bridges are fully expounded, and the terms of "Arch Type Timber Bridge" (p.102) and "Rainbow Bridge Type Timber Arch Bridge" (p.106) are used to refer to the lower structures of Bianhe Rainbow Bridge and Timber Arch Lounge Bridge respectively. It was the first time Chinese modern scholars made a systematic study of the rainbow bridge structure and made a preliminary summary in an authoritative work.

In the book with the title of *Chinese Ancient Bridges* edited and written by Tang Huancheng, published by Cultural Relics Publishing House in March 1987, the two types of bridge structures are equally denominated as "Combined Beam-arch Bridges" (p.64, the English translation on p.265), which is, as it explains, "a timber bridge between a beam and an arch, and the author thus temporarily denominates it as a combined beam-arch bridge, for which the Bianhe Rainbow Bridge in the *'Festival of Pure Brightness on the River'* of the Song Dynasty is a best representative." This is the first time a Chinese modern scholar expressly denominated the lower structure of a rainbow bridge, which represents a significant stage of achievement by Chinese scholars in the study of Rainbow Bridge. A "Combined Beam", however, has a special reference in the ancient Chinese architecture, meaning timber beams laid crisscross, layer on layer, which method was often used in house or bridge buildings where one layer exceeds the other for more space and a longer span. The combined beam structure came into use quite early in the construction industry, as shown in the pictures on the bronze utensils or tomb bricks dating from the Qin and Han Dynasties. The denomination of the lower structure of a rainbow bridge as "combined beam arch" may confuse with the structure of a "piled cantilever timber beam bridge" as mentioned above, because the latter is "overhanging" by way of combining beams. In fact, the author, too, felt it improper to use this name, for he says in the book "the author thus temporarily denominates (it) as a combined beam-arch bridge".

The author published his dissertation with the title of "Rainbow Bridges in China - Construction Patterns and Historical Study of Combined Beam-arch Bridges in Zhejiang-

仙居桥
Xianju Bridge



它没能明确地表达出是如何贯出虹桥的拱式结构来。

2001年3月在杭州召开的中国建筑史学第五届年会上，作者在大会上宣读了题为《中国虹桥——浙闽山区叠梁木拱桥的建筑形态及历史研究》一文，并就虹桥桥式命名一事就教于建筑史学会的理事长杨鸿勋先生。杨先生认为用“叠梁木拱”来描述虹桥结构是不准确的，并提议用“编梁木拱桥”来命名汴水虹桥的下部结构。杨先生还说用“编”来形成一种结构，小到日常生活用的器皿，比如说编的竹篓、竹筐等，大到一种建筑墙体结构，在早期的中国历史上都出现过。事实上，后一名称用“编梁木拱”四个字作桥的定语，比较完整地描述了虹桥结构的三大特征。1．构造特征：“编梁”，如果我们分别把第一系统4根拱骨和第二系统3根拱骨视为连续的经线，把横木视作纬线，则虹桥拱骨和横木上下穿插别压的交叠构造，正好与用经纬线编成织物的技术相同。而且两者都同样利用了经纬之间的摩擦力，保持结构和织物的整体稳定性；2.材料特征：“木”，表示采用圆木；3.结构力学特征：“拱”，表示是构件主要受压的结构。作者采用有限元法对其结构进行计算机模拟，证实该结构构件主要内力为纵向压力，是结构力学严格意义上的拱结构。因而具有优越的承载能力。

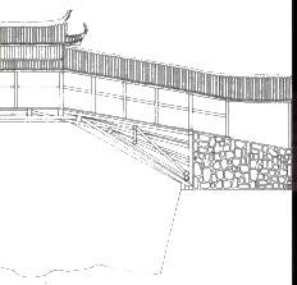
2004年6月14日，作者应邀在芬兰Lahti市举行的“世界木工程大会(WCTE2004)”上作了题为“中国虹桥”的报告，重点介绍了汴水虹桥和浙闽木拱廊桥的结构特点。在国内准备大会报告时，作者采用了杨先生提议的“编梁木拱桥”作为汴水虹桥结构的名称。

但当作者对浙闽木拱廊桥进行的结构力学分析和计算机模拟证实，由于第一系统采用5根而不是虹桥的4根拱骨。这一差别，使第二系统中央拱骨主要受弯，因而该桥结构兼具拱桥和梁桥特征，参照上述名称应称为“编梁木拱梁桥”，这一名称中出现了两个“梁”字，乃修辞之大忌。而且这两个“梁”有不同含义：第一个“梁”指用来编织的“圆木”，第二个“梁”指结构力学上受弯的构件。

由此作者建议对上述名称略作改动为“编木拱桥”，这一名称仍准确完整描述了虹桥结构三大特征。《续资治通鉴长编》中亦曾以“编木为之”来描述虹桥结构。相应的浙闽木拱廊桥的下部结构名称应为“编木拱梁桥”，两个名称反映了两类桥梁结构的大同和小异。

在WCTE2004报告英文稿中，上述两个名称分别被译为“Woven Timber Arch Bridge”和“Woven Timber Arch-Beam Bridge”。同时，接受美籍华人叶守璋先生建议，在上述报告中廊桥的英文名称译为“Lounge Bridge”，这一汉语译名采用英语的相似发音，且反映了廊屋的多种功能，是音意兼具的佳译。

木拱廊桥内景
Interior view of bridge house



木拱廊桥内景
Interior view of lounge house

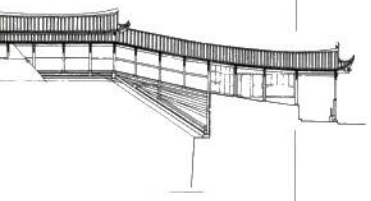
Fujian Mountainous Area" on the 5th Session of Annual Meeting on China Architectural History Science held in Hangzhou in March 2001, and asked for opinions from Mr. Yang Hongxun, Chairman of China Architectural History Association, on the denomination of the rainbow bridge. Mr. Yang said it was inaccurate to denominate the structure of Rainbow Bridge as "Combined Beam Timber Arch", and proposed the use of "Woven Beam Timber Arch Bridge" for the lower structure of Bianhe River Rainbow Bridge. Mr. Yang further explained that "weaving" as a method used to shape up a structure had appeared quite early in Chinese history, and that kind of structure ranged from daily utensils, such as a bamboo basket, to a building construction. In fact, the latter of the two denominations of the bridge, modified by the four words - "woven, beam, timber, arch", is a comparatively adequate description of the structure incorporating its three features. First, the feature of its construction as "woven": If we regard the 4 segments in system I and the 3 segments in system II as the continuous warps and the horizontal logs as the wefts, then the crisscross structure of the rainbow bridge represented by the arch pillars and the horizontal logs pressing one another is in many ways the same as the weaving technology in textile. And both technologies make use of the friction between the warps and the wefts to maintain the general stability of the structure or textile; Second, the feature of its material as "timber", where logs were used; Third, the feature of its structural mechanics as an "arch", representing a structure where its components are mostly pressed. The authors conducted a computerized simulated test on the structure with limited elements, and proved that the internal force of its structural components was chiefly longitudinal pressure, which makes it an arch structure in a strictly mechanical sense, and therefore it has a good bearing capacity.

On 14 June 2004, the authors were invited to give a lecture on the "Rainbow Bridges in China" at the World Congress on Timber Engineering 2004 (WCTE2004) held in Lahti, Finland, which emphatically introduces the structural features of Bianhe River Rainbow Bridge and Zhejiang-Fujian timber arch lounge bridges. When they were preparing the report for the congress in China, the authors adopted the denomination of "Woven Beam Timber Arch Bridge" for Bianhe River Rainbow Bridge, as proposed by Mr. Yang.

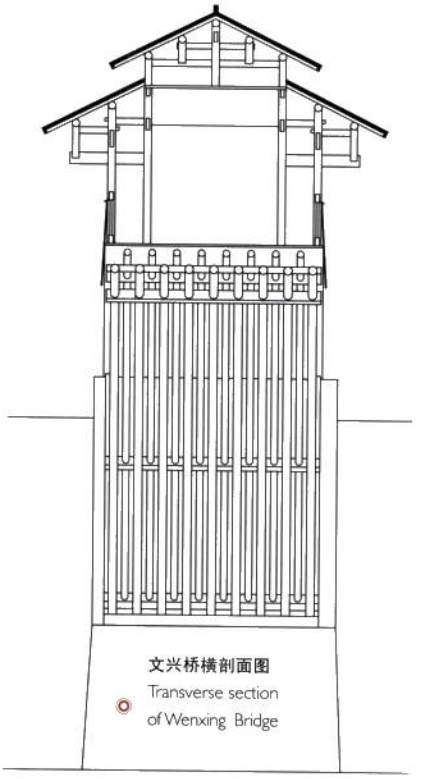
When the authors were doing the computerized simulation test and structural mechanical analysis on Zhejiang-Fujian Timber Arch Lounge Bridge, they used 5 instead of 4 segments in system I, which cause the bending of the central segment in system II, so the bridge structure has features of both an arch bridge and a beam bridge, thus the above denomination shall be "Woven Beam Timber Arch-beam Bridge", where the word "beam" had to be repeated. That, however, is a rhetorical mistake, for the word "beam" has different meanings to themselves, the first being a "log" in the woven structure, and the

廊屋里的柱础
Base of column in lounge house

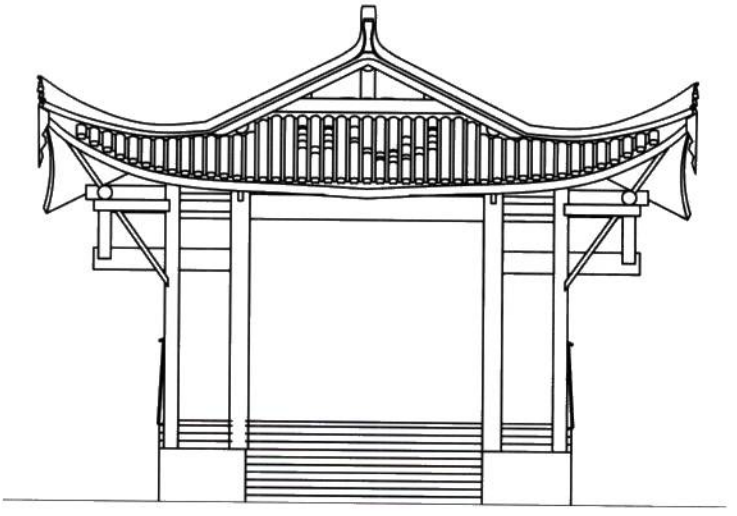
因此，作者将汴水虹桥和现存的浙闽木拱廊桥的下部结构命名分别规范为“编木拱桥”（英文译作“Woven Timber Arch Bridge”）和“编木拱梁桥”（英文译作 Woven Timber Arch-Beam Bridge），而将目前国内非常时尚的“廊桥”一词英文译名规范为“Lounge Bridge”，浙闽一带尚存的“木拱廊桥”一词英文译名规范为“Timber Arch Lounge Bridge”。



北涧桥
Beijian Bridge



文兴桥横剖面图
Transverse section of Wenxing Bridge



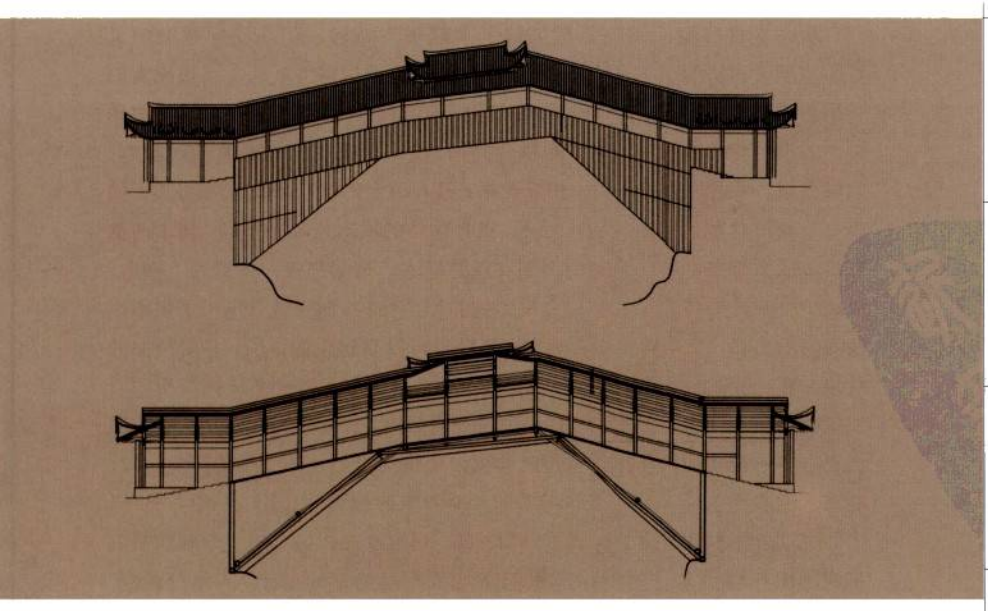
文兴桥侧立面图
Transverse elevation of Wenxing Bridge

second being a bending component in the mechanics context.

So the author suggested amending the above denomination into "Woven Timber Arch Bridge", which still accurately describes the three features of the rainbow bridge structure. The wordings of "weaving timber into a bridge" are used to describe the rainbow bridge structure in the book with the title of Chronological Edition of Continuation to the *Historical Events Retold as a Mirror for Government*. The relevant lower structure of Zhejiang-Fujian timber arch lounge bridges shall then be denominated as "Woven Timber Arch-beam Bridge", which reflects both the similarities and differences between the two bridge structures.

In the English version of the report for WCTE2004, the two denominations above are respectively "Woven Timber Arch Bridge" and "Woven Timber Arch-beam Bridge". As suggested by Mr. Ye Shouzhang, an American Chinese, the English name for a "Lounge Bridge" appearing in the above report was a good translation of the Chinese term "Lang Qiao", for the English word "Lounge" identical with the Chinese word "Lang" is not only similar in meaning but also in pronunciation.

Therefore, the authors have given formal names to Bianhe Rainbow Bridge and the lower structure of the timber arch lounge bridges existing in Zhejiang-Fujian area as "Woven Timber Arch Bridge" and "Woven Timber Arch-beam Bridge", and the word "Lang Qiao" which is a fashionable word in China has a formal name of "Lounge Bridge", and the word "Mu Gong Lang Qiao" representing the bridges existing in Zhejiang-Fujian area has a uniform denomination of "Timber Arch Lounge Bridge".



文兴桥正立面图
Longitudinal elevation of Wenxing Bridge

文兴桥纵剖面图
Longitudinal section of Wenxing Bridge

汴水虹桥和浙闽木拱廊桥的历史渊源

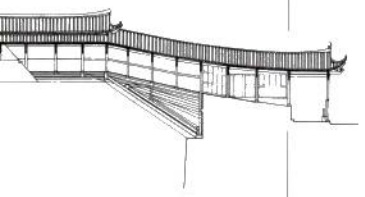
Historical Relations between Bianhe Rainbow Bridge and Zhejiang-Fujian Timber Arch Lounge Bridges

汴水虹桥与浙闽木拱廊桥都是全木构体系的桥梁，有相同的编木拱结构，这是它们最大的特点，也是能够被称为“虹桥”的必备特征。然而，两者之间也有着较多的差异：第一，汴水虹桥为纯粹的编木拱结构，而后者却是编木拱与木梁相结合的拱梁结构；第二，汴水虹桥的编木拱在节点上使用北方常用的棕绳绑扎技术，而后者使用的是南方惯用的榫卯技术；第三，汴水虹桥的木拱之上并不设廊屋，而后者的拱梁之上均设置翘角飞檐的青瓦木屋顶；第四，汴水虹桥的拱形结构外形呈完整的弧形，而后者的拱梁结构外形却略似“八”字形；第五，汴水虹桥的结构跨度在18米左右，而后者单跨跨越河道的宽度从9米左右一直到42米左右的范围均可，比较而言，后者适应河道的能力更强，跨越空间的能力更甚；第六，汴水虹桥因为使用于地势平坦的中原地区，只用了编木拱一种结构体系，而后者是运用在浙闽山区的大山密林之中，深沟高涧之上，除了拱梁体系外，还常常在靠近两岸的下部结构中运用了门式刚架，增强桥梁结构的受力性能，也能增大拱梁结构的跨度。如果细细比较两种结构，当会寻找到更多的相似和差异来。

浙闽木拱廊桥的结构原理类似于“虹桥”结构，但在实际建造中又有所差别。该桥的结构分为两个系统:第一系统用材粗大且长，三根硕大的长拱骨通过横木联系，长拱骨并列九组；第二系统用材较第一系统稍细稍短，五根短骨通过横木联系，短拱骨并列八组，但最上一根拱骨通过横木，改成九根。两系统的两种拱骨相互穿插，只有顶上的第二系统拱骨与其下的第一系统拱骨数目相同且相互对齐。拱骨联结的横木与虹桥不同，横木两侧开凿，成为榫接。第二系统的端部支点的横木，是端部竖向排架的下横木，形成一个很好的传递推力和垂直反力到石岸的结构。水平拱骨采用了粗细比较均匀的木料，整个结构闭合后，水平拱骨可以起到梁的作用，承受桥面的荷载。第一系统的下横木，顶在端部排架下部，避免了两个系统拱骨交于一处集中过多的榫接。此外，一共用了四个剪刀撑，分别起着固定第一、二系统左右第一根横杆的作用。从桥底仰视，交错的第一、第二系统拱骨之间，填塞了一些小木料，这些木料起着防止拱骨纵向位移的作用。

面对两种木拱结构的众多相同和差异，研究者能否结合历史文献的研究和浙闽山区以百余计的木拱廊桥的实地考察，从中总结出二者的渊源关

The structural principles for the lounge bridges in Zhejiang-Fujian area is similar to that of a Rainbow Bridge, but they are practically different in constrcution. Its structure may be divided into two systems - System I uses large and long logs, where three long arch pillars are connected through horizontal logs, and the long arch pillars stand in nine groups; system II uses smaller and shorter logs, where five short pillars are connected



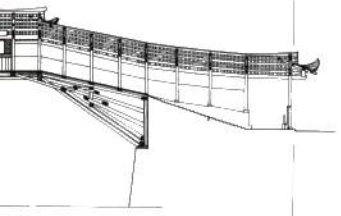
系？借用生物学的术语，如果它们真有亲缘关系，那么，哪些基因是共同遗传下来，哪些又是发生了变异的呢？

中国现代最早研究虹桥结构的桥梁史学家唐寰澄先生认为：浙闽木拱廊桥是汴水虹桥的改进型桥式，是随着宋室南渡士工农商将造桥技术带到了浙闽山区，再结合当地的木构技术逐步发展起来的。这种观点在其主编和著述的《中国科学技术史·桥梁卷》和《中国古代桥梁》书中都有体现，在稍早出版的茅以升主编的《中国古桥技术史》一书中，木拱桥一章的撰作也是出自唐先生之手，观点亦一致。后来桥梁和建筑专家也多持此观点。不过，也有不同意见者，其中包括浙闽山区的文物工作者，可惜拿不出更多、更可靠的证据。④

through horizontal logs, and the short arch pillars stand in eight groups, but the topmost arch pillar changes to the ninth pillars through a horizontal log. The two kinds of arch pillars of the two systems weave in each other, except that the arch pillars of system II on the top are identical in number with and parallel to the arch pillars of system I under it. The horizontal log at the arch pillar connection is different from that of a Rainbow Bridge, on either end of which a mortise is made for a joggle joint. The horizontal log at the terminal fulcrum of system II is the lower horizontal log of the vertical bent frame at the terminal, which makes it a good structure that conveys the pushing force and the perpendicular reacting force to the stone bank. The horizontal arch pillars are made of logs of even caliber, which may serve as a beam to sustain the load from the bridge surface when the entire structure closes. The lower horizontal log of system I, supporting under the bent frame at the terminal, serves to prevent the arch pillars of the two systems having excessive joggle joints concentrated at one point. In addition, four X-bracings are used to stabilize the first horizontal shafts on both sides of system I and II. Viewed from the bottom of the bridge, between the interweaving arch pillars of system I and II are filled some smaller timber materials, which help to prevent the longitudinal deviation of the arch pillars.

The author has discovered, by years of inspection and research work, that the timber arch lounge bridges now preserved in Zhejiang-Fujian mountainous area share the basically same arch-beam structure, though they may be more or less different in the process of construction depending on different master artisan or craftsmen families.

The author has taken his most familiar place, Taishun County of Zhejiang Province, for example, and made an inspection and comparative study of all the bridges featuring timber structure; he finds that these timber bridges of various types range from the simple to the complicated in terms of their major structures, and wonders if they are the surviving timber bridges of the various types in this area over the development process. The construction of timber bridges has long been part of engineering technology, but the author wonders if engineering technology could have followed the same process of creation, development and maturity in the history as the evolution process of living creatures by inheritance and variation. This may be summarized briefly as follows: a certain technology may be "inherited" by reproducing itself on a stable basis when it suffices to satisfy one's demands; but when the previous technology fails to satisfy new demands, a technology revolution is introduced and "variation" occurs; it is a creative revolution, i.e., "mutation", that pushes forward technology improvements; a mutation often occurs to a part when the remaining parts are still inheriting, that is to say, partial "mutation" among general "anamorphosis"; a "mutation" may occur initially in multiple

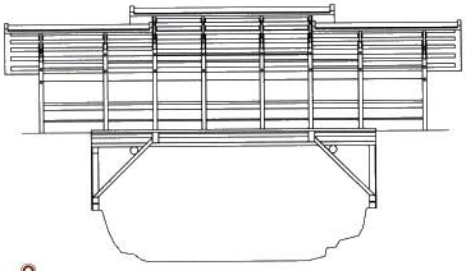


作者自1996年起，连续八年里每年都亲赴浙闽山区考察乡土建筑及木拱廊桥。迄今为止，在浙江省境内，作者已经考察了除青田县以外其余差不多所有的木拱桥，亦即分布于泰顺县、庆元县、景宁县的木拱桥；在福建省，作者亲自考察了在寿宁县的19座木拱桥，武夷山市的余庆桥，另外通过作者的外围研究合作组织，差不多把整个闽东的木拱桥全部考察完毕，它们分别位于闽东的寿宁县、屏南县、周宁县、古田县、福安市、柘荣县、福鼎市和霞浦县，但是目前还没能考察到闽北地区的虹桥。根据其他研究人员的考察结果，可以肯定的是在闽北地区的政和、松溪等县还分布着一定数量的木拱桥。据初步统计，在浙南闽东山区共有虹桥结构的木拱桥87座左右，加上甘肃省渭源县的1座，再加上闽北地区的虹桥数量，中国现存虹桥结构总数当在100座左右，当然此数字不包括近年来刻意重新仿造的类似结构的桥梁。

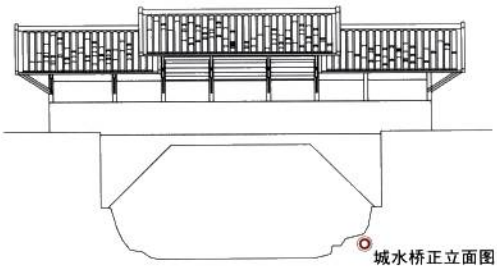
通过多年的考察研究，作者认为浙闽山区保存的木拱廊桥在拱梁结构上基本是一致的，由于不同地区，尤其是出于不同木匠师傅（工匠家系）之手，在桥梁结构的建造过程中或多或少有些差别。但是，这些细微的差别都改变不了浙闽木拱廊桥的拱梁结构特征。

作者以前过多地把考察和研究的注意力集中在木拱桥一种桥式上，并且研究的着眼点一直局限在建筑学和建筑史学的狭隘范畴，经过几年的研究积累仍然没能从中找到这些木拱桥的技术来源。从2001年起，随着研究队伍的扩大，尤其是有着深刻工程以及结构力学背景的专家加盟，作者将研究视野扩展到浙闽地区所有的以木构为主的桥梁中来，并运用了工程技术学和其他学科的思维方法进行综合研究。由于这一地区幅员辽阔，山高水长，木构桥梁的总数不下千余。作者以最熟悉的浙江省泰顺县为例，对所有的以木构为主的桥梁进行了对比考察和研究，总结发现这些形形色色的木桥从其主体结构来看，大致呈现出有简有繁的状况，并且这种从简到繁是有许多中间层次，这会不会是这一地区木构桥梁在发展过程中各类桥式的一种孑遗现象。木桥的营造自古以来都属于工程技术的范畴，于是，作者想到工程技术由发生、发展到成熟的过程在历史上的发展遵循类似生物通过遗传和变异实现进化的规律。其原理简述如下：某种技术在尚能满足需要时，将会“遗传”，即基本稳定地复制；当有新需求出现，原技术不能满足时，将会引发技术变革，产生“变异”；推动技术进步的是创新性的变革，即“突变”；“突变”一般发生于局部，其余大部分仍是“遗传”，即全局“渐变”，局部“突变”；“突变”初生时会有多种形式，在一定时期内并存，且不稳定；一段时期后，不同形式的“突变”会“优胜劣汰”，即淘汰较差的，保留完善较好的；最终保留的一种或少数种“突变”形式会趋于完善稳定进入“遗传”阶段。上述过程周而复始，多次发生，形成某一种技术发展的历史过程。[2]

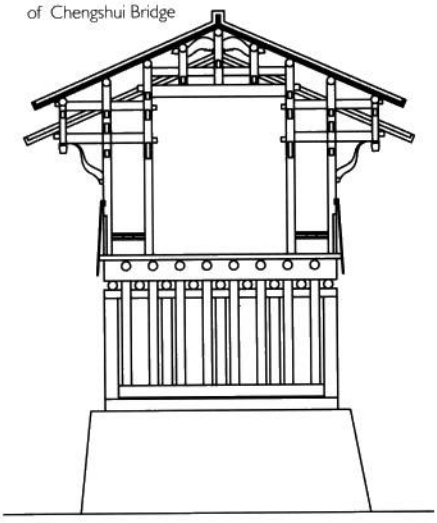
◎ 廊屋内景
Interior view of lounge house



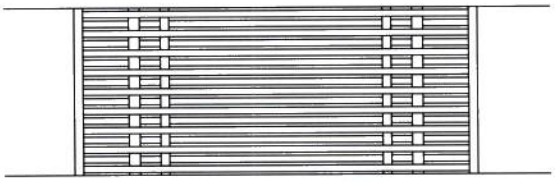
城水桥纵剖面图
Longitudinal section
of Chengshui Bridge



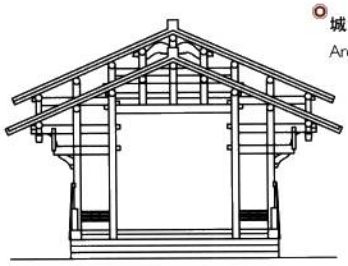
城水桥正立面图
Longitudinal elevation
of Chengshui Bridge



城水桥横剖面图
Transverse section of Chengshui Bridge



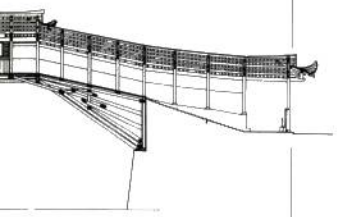
城水桥桥底仰视平面图
Arch plan of Chengshui Bridge



城水桥侧立面图
Transverse elevation of Chengshui Bridge

forms, which may be co-existing, unstably, for a certain period; these forms of mutation may select the best to survive the poor in a period of time; and the last few form(s) of "mutation" to survive will tend to stabilize and enter the stage of "inheritance". The above process will come over again and again, which constitutes the historical development of technology.

Talking of the history of constructing rainbow bridges, scholars will think of Santiao Bridge, a special bridge in Taishun, Zhejiang Province. The existing Santiao Bridge is located across the Hengxi Creek between Zhouling Township and Yangxi Township, bordering Shouning County, Fujian Province. Santiao Bridge stands away from noisy highways and modernized environment and in the remote valleys where paths are winding and scenes are beautiful. Stepping on Santiao Bridge, one may forget about history and get lost in his reveries. It is that bridge, too, that keeps the secrets for a thousand



溪东桥
Xidong Bridge

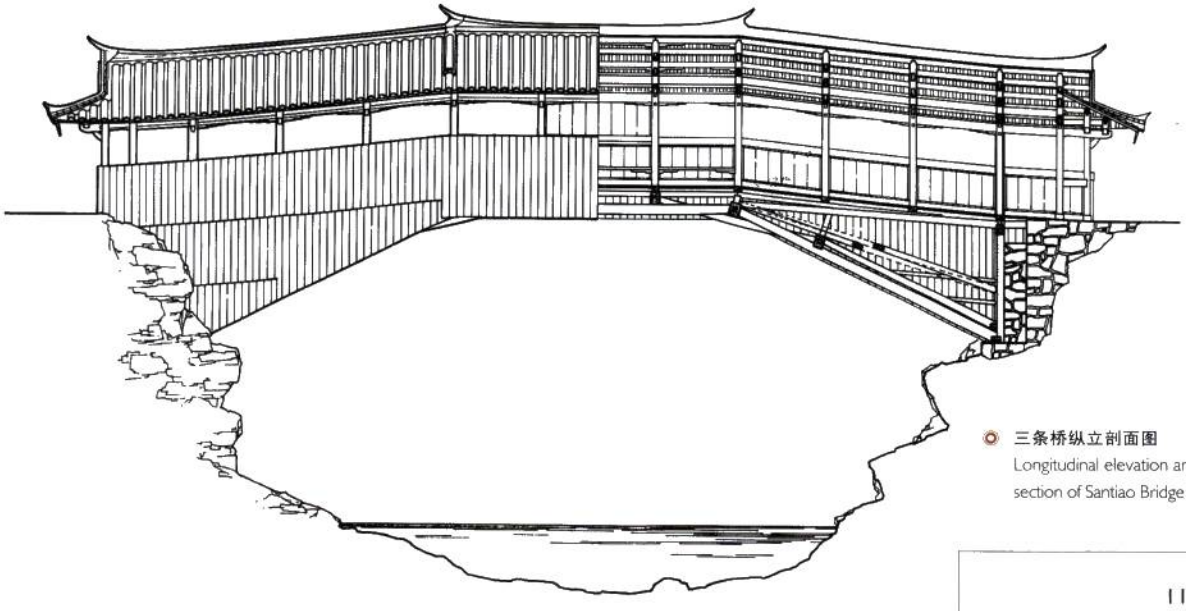
遵循上述原理，作者将泰顺县的木构桥梁进行了分类整理，基本上勾勒出了如下的桥梁发展谱系：1. 简支梁桥→ 2. 连续梁桥→ 3. 斜支撑桥→ 4. 带有编木结构的斜支撑桥→ 5. 编木拱梁桥或编木拱桥。要完成此谱系，需要经历五个桥式的发展过程。在这五个过程中，作者先是掌握了1、2、3、5四个桥式的实例，根据上述原理假想应该有第4种中间过程的桥式，经过两年多的实地考察，作者终于在浙闽山区找到了这个中间过程的桥式实例——城水桥。这五种桥式的实例全部是泰顺一地所拥有。如果这一木桥向木拱桥发展演变过程的假想成立，那么，在浙闽山区独立发展编木拱梁桥的观点就可能成立。反观汴水虹桥所在的北宋东京，即使将整个中原地区算在内，恐怕要找到上千座的木构桥梁也非易事。因为，当时经济文化发达的中原可以有石桥乃至石拱桥等先进桥式的更多选择。没有了广泛的木桥建造基础，从纯技术上讲就失去了在当地产生高水平的先进木桥桥式的可能，何况是汴水虹桥如此完美的编木拱式结构呢？

谈到虹桥营造的历史，研究者们都会共同关注到一座特殊的桥梁，那就是浙江泰顺县的三条桥。现存的三条桥位于洲岭乡通往垟溪乡的横溪上，邻界福建省寿宁县。三条桥远离喧嚣的公路以及现代文明化下的城乡环境，置身于幽溪深涧之中，山道曲折，风景优美而古雅。登临三条桥，极易让人忘却了历史，展开无限遐想。但正是这座三条桥，承载了太多中国虹桥营造的千古之谜。

据清光绪泰顺《分疆录》记载："三条桥在七都。此桥最古，长数十丈，上架屋如虹，俯瞰溪水。旧渐就圮。道光二十三年（1843），里人苏某独力重建，拆旧瓦有'贞观'年号。"1982年，泰顺县文博馆专门调查，又在此桥的屋面上发现一块刻有"丁巳绍兴七年九月十三□□工□瓦其□米谷□□□□□五十文"字样的旧瓦。经考证为宋绍兴七年（1137）。桥上发现唐宋的旧瓦似乎并不能证明在同一时期的桥身就是木拱结构，但是，根据其他情况证明其木桥结构的存在应该是没有多大问题的。

另据泰顺县交通局编1991年由中国海洋出版社出版的《泰顺交通志》记载："距现桥上游十余米的西岸巨石上，尚有旧桥址的柱孔遗迹，四个方孔向东岸倾斜，两个圆孔朝天。"唐寰澄先生和泰顺文博馆馆长张俊先生都曾根据这些桥洞遗迹做了木桥的复原图。由于两人的观点不同，所复原的木桥桥式也有所差别。唐先生所复原之桥式更像作者上面提及的第3与第4过程之间，而张俊复原的桥式更趋向第4、第5过程之间。但不管怎样，三条桥上游之旧桥肯定是上述五个过程桥式之一。也许，众多的桥洞遗迹根本就不是一座木桥所有，更可能是多座不同桥式桥梁建造后的遗迹之总和。同样根据《分疆录》记载，最初的三条桥就是由三根巨木跨溪而成的简支梁桥，因而命名为"三条桥"。

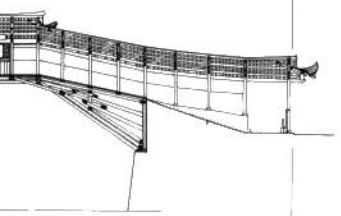
三条桥
Santiao Bridge

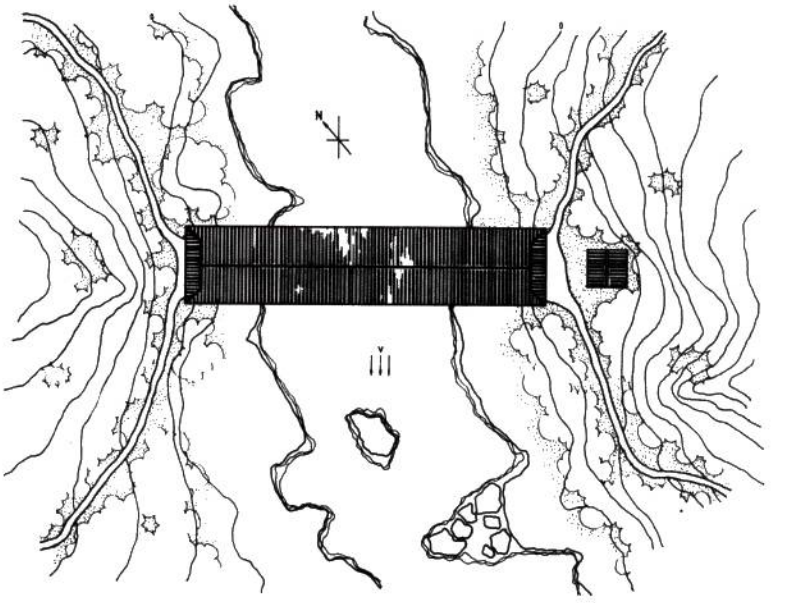


三条桥纵立剖面图
Longitudinal elevation and section of Santiao Bridge

作者根据对三条桥的研究认为，三条桥及其周边桥洞遗迹上的原有桥梁组合在一起，极有可能完成了上述桥梁发展历程中的五个步骤全过程的演进。最终桥梁结构的演进定格在第5种桥式，即编木拱梁桥。

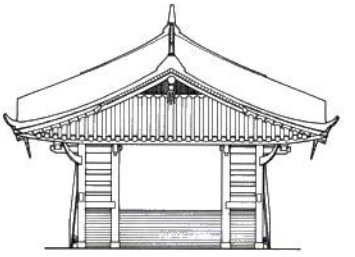
同样，作者在庆元县调查时，发现大济村的“双门桥”在丽水地区创建年代最早（虽于1992年底曾重建，但桥式和梁架基本无大变化）。其廊屋明间梁下，有墨书“大宋天圣三年甲子（1025）吴毅、吴毅兄弟二公仝建双门桥”字样。清光绪三年编修的《庆元县志建置》（政协庆元县委文史资料研究委员会1985年编注释本）也记有：“双



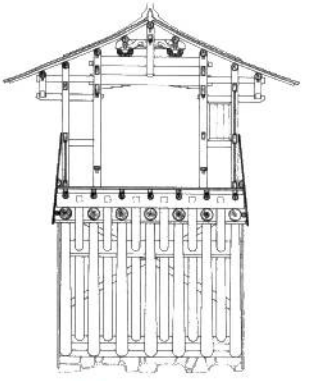


三条桥总平面图
Site plan of Santiao Bridge

廊屋内的藻井
Celling of lounge house

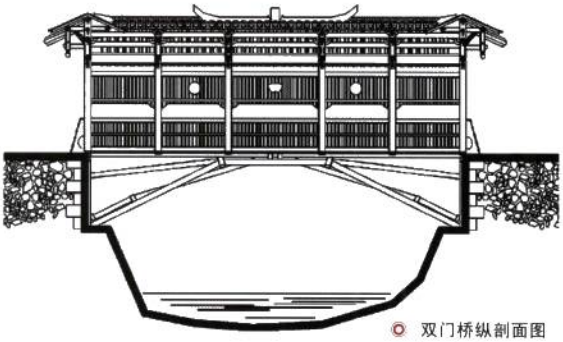


三条桥侧立面图
Transverse elevation of Santiao Bridge

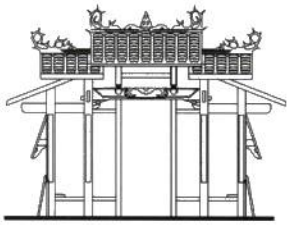


三条桥横剖面图
Transverse section of Santiao Bridge

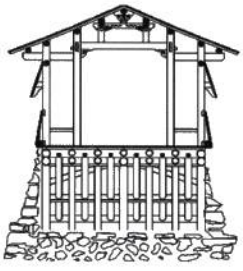
◎ 双门桥
Shuangmen Bridge



◎ 双门桥纵剖面图
Longitudinal section
of Shuangmen Bridge



◎ 双门桥侧立面图
Transverse elevation
of Shuangmen Bridge



◎ 双门桥横剖面图
Transverse section
of Shuangmen Bridge

门桥，吴毅、吴毅兄弟联登，竖双门于桥侧，故名。”如果双门桥的编木拱梁桥桥式果真是大宋天圣三年（1025）建成，那其建造的时间要早于夏竦于明道中（1032－1033）建造虹桥至少7年，正好晚于天禧元年（1017）魏化基罢修无脚桥8年。

再说说吴毅、吴毅两兄弟及其双门桥。据清光绪三年编修的《庆元县志选举志》记载：“天圣（仁宗）二年甲子科（宋郊榜）：吴毅，官至太子赞善改殿中丞，有传。景祐（仁宗）元年甲戌科：吴毅，濠州知府特授守秘丞，有传。” 吴毅是宋朝第一位通过科举取仕的庆元籍人士，并且官至殿中丞。据上海辞书出版社1992年版的《中国历代职官词典》载：“殿中丞：官名。唐改殿内省为殿中省，殿中丞为其属官。”又“殿中省：官署名。唐武德元年（618），改殿内省为殿中省，掌皇帝生活诸事，所属有尚食、尚药、尚衣、尚舍、尚乘、尚辇六局……宋沿置，仅为寄禄官，六尚局职掌分由它署担任……”根据以上信息可知，吴毅建议甚至参与皇城内的桥梁营造也不是没有可能。现存之双门桥，单孔净跨11.20米，宽4.60米，其桥身结构非常接近于编木拱桥式，其跨度与汴水虹桥（跨度估计是16～18米）也比较接近。因此，在汴水虹桥之前的一种桥式由吴毅这样背景的官员带到北宋东京城也是极有可能的，编木拱梁桥的技术再与北方中原地区固有木构技术融合，最终形成了千古奇观的编木拱桥——汴水虹桥。

除却上述两例，浙闽山区营造木拱廊桥的历史至少可以追溯到明代。据《中国古桥技术史》一书记载，浙闽山区最古的当数泰顺叶瑞旸桥，建于明景泰五年（1454），可惜于1965年修建公路遭拆除。至今保存完好的庆元县如龙桥建于明天启五年（1625）。据泰顺文博馆研究人员的考证，当地还有几座现存的木拱桥初建年代大多是在明代。由此可见，浙闽山区木拱廊桥营造的历史极有可能是上迄宋代，往下一直延续至今，没有间断的迹象。

通过上述的初步论证分析，至少可以得出以下三个结论：

第一，作者规范了汴水虹桥和浙闽木拱廊桥下部结构的命名，分别即“编木拱桥”（英文译作“Woven Timber Arch Bridge”）和“编木拱梁桥”（英文译作Woven Timber Arch-Beam Bridge）。同时将目前国内非常时尚的“廊桥”一词英文译名规范为“Lounge Bridge”，浙闽一带尚存的“木拱廊桥”一词英文译名规范为“Timber Arch Lounge Bridge”。

第二，从纯技术的角度来讲，编木拱梁桥的桥式是在浙闽山区一步一步，由简到繁，独立地发展起来的，编木拱桥是木构桥梁发展的最高形式。

第三，从木拱桥的实地调查和文献研究上看，也确实存在从浙闽山区往中原地区传播先进桥式——编木拱桥的可能。

【注释】

①详见唐寰澄著《中国科学技术史·桥梁卷》第461页。北京：科学出版社，2000年版。

②张择端，虽于《宋史》、《宣和画谱》等著作中均不见记录，但据《清明上河图》画后金代张著的跋文称：“翰林张择端，字正道，东武（今山东诸城）人也。幼读书，游于京师。后习绘事，本工其界画，尤嗜舟车、市桥、郭径、别成家数也。”以及张公药、倆权等在图后的题跋，皆认为图中所绘乃北宋晚期政和、宣和（1111年－1125年）间的宋都汴京景象。故，张择端及其所绘之《清明上河图》当是北宋时期的人和物。关于此点，学术界并无异议。

③详见宋·孟元老著，邓之诚注，《东京梦华录》，中华书局，1982年版。

years regarding the construction of rainbow bridges in the Chinese history.

According to the book by the title of *Records of Provincial Borders of Taishun* written during the reign of Guanxu of the Qing Dynasty, "Santiao Bridge lies in Qidu. It is the oldest bridge in the County, several zhang in length like a rainbow, on which are built several lounge houses looking on the river. It has deteriorated with the passage of time. A native of the Su Family rebuilt it independently in 1843, and found among the debris some broken tiles carved with the words 'Zhenguan', the title of an emperor's reign during the Tang Dynasty." The Taishun Cultural Museum made a special investigation of the bridge in 1982, and found another tile on the bridge surface carved with the almost illegible characters "...on 13th of September (lunar calendar) in the 7th year of the reign of Shaoxing...tiles...its...grain and rice...fifty cents...." The 7th year of the reign of Shaoxing is the year 1137 of the Song Dynasty. Having found the tiles of the Tang and Song Dynasties may not seem to prove that all the bridges of the same period were timber arch, but the existence of timber bridges should be doubtless.

In addition, according to the *Traffic Records of Taishun* prepared by the Traffic Bureau of Taishun County and published by China Maritime Publishing Press in 1991, "More than 10 meters away from the existing bridge in the upper reaches of the river on the west bank lies the remainder of the post openings of the bridge; four of the square openings leaning eastward and two of the round openings leaning upward." Both Mr. Tang Huancheng and Mr. Zhang Jun, director of the Taishun Cultural Museum, have drawn the restoration pictures for these openings, but due to the differences in their opinions, the styles of the timber bridges are somehow different. The restoration picture by Mr. Tang tends to resemble the one between stage 3 and stage 4 as mentioned above by the author, whereas the picture by Zhang Jun tends to resemble the one between stage 4 and stage 5. No matter how different they are, the old bridge standing away from the existing Santiao Bridge in the upper reaches of the river falls definitely in one of the five stages. Furthermore, this remainder of openings does not belong to a single timber bridge, but is a gathering of multiple bridges of different types that had been constructed over the history. It is also the record of the book *Records of Provincial Borders of Taishun* that says, the oldest form of Santiao Bridge was nothing but three big logs put up across the river, thus was called "Santiao", meaning "three logs".

The author believes, by studying Santiao Bridge, that Santiao Bridge, along with the bridges standing near it of which only the remainder of openings exists, are very likely to have completed the five stages of evolution in the history of bridge construction. The evolution of bridge construction ended with the 5th stage, i.e., the woven timber arch-beam bridge.

◎ 双门桥
Shuangmen Bridge

④方拥先生在其“虹桥考”一文中也认为浙闽虹桥更早，详见《建筑学报》1995年第11期，第56页。浙江省泰顺县文博馆夏碎香、张俊二同志根据地方史籍《泰顺分疆录》一书中有“三条桥最古，拆旧瓦有‘贞观（627－649）’年号。”以及1982年，县文博馆在三条桥屋面上发现刻有“绍兴七年（1137）”字样的旧瓦…… 等原因认为泰顺木拱廊桥有比虹桥更为悠久的历史，或者至少是一个独立发展的体系。

⑤详见刘杰2003年所申请的国家自然科学基金（青年科学基金）项目“中国南方古代木作建筑技术源流研究”的报告正文第13页。

泰顺廊桥的营造和习俗

Construction and Customs of Taishun Lounge Bridges

在传统的中国社会里，几乎所有的建筑工程活动都始终会伴随着一些重要的宗教仪式与民间的信仰行为，作为重要的土木工程内容之一的造桥也不例外。建桥礼仪只是中国传统建筑礼仪中的一个重要组成部分。架桥铺路，自古以来就是中国乡村社会里的重要公共事业活动，其牵涉面广，投资巨大，对乡民们的生活影响极其深远。传统的风水学说，总会对造桥铺路做出许多的解释，其中多数是牵强附会，诸如“关锁水口”之类，但作为在过去相当漫长的历史长河中占据了重要规划建设理论地位的风水术毕竟对传统的营造活动或多或少起着指导性的作用。

泰顺已有千年的建桥历史，木拱廊桥的营造至少也有五六百年。造桥工匠们在长期的劳动中，形成了各式各样的造桥习俗。由于政治、经济和文化等方面的原因，建造木拱桥从1949年后逐渐减少，到了1980年后再也没有人建造木拱桥了。现尚健在的中老年桥工越来越少，主墨工匠更是屈指可数，几百年来形成的造桥习俗已逐渐鲜为人知。这些习俗既有它合理的因子，也有迷信和蒙昧的东西，但它是在漫长的劳作岁月中逐渐形成的，对我们了解中国传统的造桥文化，仍有很高的历史价值和学术价值。

Taishun has a history of bridge construction of over a thousand years, and a history of building timber arch lounge bridges of at least five to six hundred years. Various local customs for building bridges have developed among bridge builders. They may be scientific in a way, but many of them are superstitious; as they gradually took shape in years of human labor, these customs can still have very high historical and academic values for our study of the Chinese traditional culture of bridge construction.

廊屋内的香炉
Censer in a lounge house

建桥首事和立约“桥批”

Authorized Representative and Agreement of Bridge Building

中国传统的乡土社会中，修桥铺路从来都是造福一方的善举，更是公益性的工程活动，极易受到官方和民众的支持。在泰顺，廊桥有官府出钱组织修造的，诸如县城南门的登云桥和仙稔乡的仙居桥；更多的廊桥却是宗族或家族合力修建的，比如三魁镇的薛宅桥、洲岭乡的三条桥、筱村镇的文兴桥以及彰州的永庆桥和南阳桥等。从建造的数量来看，私建的廊桥在泰顺县占多数。

家族或宗族组织建造廊桥，募集到足够或相当的资金后，便要“求大木，择工师”。募集资金和寻求造桥“工师”都是责任重大而异常艰难的事情，需要杰出的人才，这就有了“建桥首事”一职的产生。一般来说，建造廊桥的首事会有好几位，但其中有一位是主要首事者。官府修桥

三条桥
Santiao Bridge

自然是由官府中人出任首事，私建的桥梁一般由组织建造廊桥的宗族或家族中德高望重又有旺盛精力的人出任，因为主事造桥是一件需要付出极大智慧和太多精力而又责任重大的苦差事。

虽然，造桥首事的工作比较艰辛和困难，但是造桥的事业在大多时候总会得到众人的拥戴。因为造桥这活动，是大大的善举，不仅是自己族人，邻近村落的乡民也乐于捐助，族人们更是有钱出钱，有力出力，也有到自家山上伐木捐赠，“或一家一支，或二三家（一支），或八九十家（一支）不等”（见三魁镇薛氏宗谱《重修锦溪桥记略》）。

“建桥首事”选出后，建造廊桥的工作就可以正式开始，第一步就是要“择工师”。“择工师”并不只是选择造桥工匠，还要编制预算，并且这些内容都将写进特定的条约。这种条约有些类似当今的委托合同书，而签订这种合同就叫立约。在包括泰顺县在内的浙闽山区，建桥董事、缘首等与造桥工匠签订的建桥合同书，称为“桥批”、“桥约”、“请约”，到晚些时代就有直称合同的了。

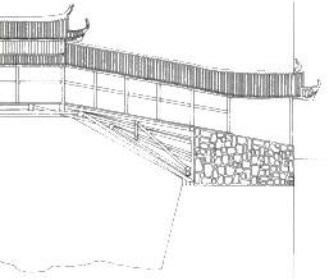
桥批一般为毛边纸或宣纸，用毛笔竖式书写[①]。书写的内容主要是董事、缘首为建造或重修某地某桥，今在某某邑某某村请得木匠某某某造桥之类。其具体内容主要有：一是建桥方提出所建桥的长度、高度、宽度，桥面上立几颗柱子，桥内是否架设板凳和设置神龛等；二是若为拆旧桥重建，则提出要拆换何处桥苗（作拱骨用的梁木）、桥面板、枋檩木若干等；三是两端桥台的高度、宽度、厚度及砌法、用石规格尺寸；四是材料的供给，如桥苗（作拱骨用的梁木）运送何处，毛竹搭架木料、篾绳、铁钉，有的连工匠墨斗用的墨斗线是自备或建桥方供给也写得清清楚楚；五是除木匠外，建桥台的石匠，盖桥屋的泥水匠等由建桥方或是承建方谁来负责；六是总造价多少，如何兑付；七是每月初一、十五以及敬神福仪的开支，上梁的花红（给主墨工匠的红包）开支数额；八是双方中有一方违约的罚款情况等。而后书写签约时间、签约人姓名（盖章或画押）、见证人、代笔者。在时间后还要慎重书上骑缝字（多为吉祥词），最后常在左上角书上“□□大吉”等字。若有添补遗漏约定，也还要再由书写人签字画押，以示慎重。

桥约签订之后，即可择日起工。择日也是需要严格的程序和特定的仪式，对整个造桥工程进行详细日程的安排，这些时间的排定得有专门的择日先生根据传统历书上的黄道吉日作依据。

Having raised sufficient fund, a family or clan will manage to construct a lounge bridge by "seeking large logs and selecting great masters". Fund-raising and master selection are both important and difficult matters, so some outstanding people have to appear to take care of the "authorized representative of bridge building".

When the "authorized representative of bridge building" are decided, the construction of lounge bridges is to commence; the first step to take is to select great masters. "Selecting great masters" is not only to select bridge builders, but also to prepare a budget, which will be incorporated in a specific agreement. The agreement is something like the entrustment contract today and to sign such agreement is called "contractual conclusion". In Zhejiang-Fujian mountainous area, including Taishun, the contract for bridge building between the director or leader of bridge building and the bridge builders is called an "Approval", "Offer", "Invitation" or "Agreement".

廊屋的檐角
Cornice of lounge house



霞光桥（内景）
Xiaguang Bridge (interior view)

择日先生和择日起工
Fortune Master and Choice of Date

在筹建桥的董事们与首事在正式聘请了造桥工匠之后，就要开始正式谋划桥梁的建造事宜。在泰顺这样的浙闽山区，建造廊桥首先要做的就是确定桥墩的具体位置。桥梁具体位置、桥身的朝向对于建成后之桥梁坚固耐用非常关键，建造木拱廊桥尤其如此。要选址造桥，得请地理先生出马。

地理先生在测定了两端桥台的坐向方位后，就得再请择日先生选取架马上梁等黄道吉日。择日吉课[2]要送给造桥工匠鉴定是否可用。仍以现存的福建省文物资料为例：清同治四年（1865）龙岩市竹森后村要建造双广桥，延请张茂秀（周宁县礼门乡秀坑村人，大概生活在1850～1920之间）、张茂巢二位工匠主其事，当时送给造桥匠师鉴定的择日吉课现在还保存了下来，其内容如下：

“一择六月廿四辛亥日宜午时木匠起工架马大吉；一择七月十二日戊辰宜辰时定磉大吉；一择七月二十日丙子日宜卯时拆旧桥大吉；一择十月初十乙未日宜卯时搭桥架或铺下层桥板；一择十月十五庚子日宜辰时平桥板大吉；一择十月二十一丙午日宜卯时聘架，未时入山迎梁；一择十月廿二丁未日宜辰时竖柱，未时上梁大吉。”

择日吉课一般还书有“大士阁坐巽正桥基坐未本年两得其利查十月节二龙俱配利月用同课构造乃属上吉”等语，也有较为简单的，如“择十月初六乙未日卯时架马及起工修造吉，十八丁未日卯时换柱升梁钉椽并吉”。有的桥还把地理先生、择日先生姓名书于桥内梁上。

择日吉课虽说带有些迷信色彩，但是它对与整个造桥工程的日程和施工内容安排，对控制整个工程的工期等都起到了非常重要的作用。

In Zhejiang-Fujian mountainous area, such as in Taishun, the first thing for building a bridge is to determine the location of the piers. The location of the bridge and the orientation of the bridge body are critical to the stability and durability of the future bridge, and it is more so for a timber arch lounge bridge. To select the best location for the bridge, a Mr. Geography must be invited.

After the Geography Master decides the orientation of both ends of the bridge, a Fortune Master must be invited to choose a fortunate date for putting up the beams. A set of documents for choice of date shall be presented to the bridge builders, who will consider if that choice is practically possible.

The documents for choice of date may have been superstitious, but they have played an important role in the scheduling and arrangement of the construction work and getting the timetable of the entire construction under control.

风水先生和桥堍选址
Feng-shui Master and Choice of Piers

风水先生，也就是前文所谓的地理先生，他们的作用被社会评价得褒贬不一，从古到今向来如此。不过，清代泰顺邑人董永孚在《重修登云桥记》一文中记录了一段关于风水术的话，也很耐人寻味："桥梁之设，原以利行人也。形家（即堪舆风水师）以水口紧关为利，似不可信，而有可信者。邑城南里许，两山分峙，瀑布悬崖。故明万历丁巳，乡士大夫建桥于其间，不过资利涉耳。硪而棣萼联鹿，后先继美，邑人利之，似非形家臆说也。"

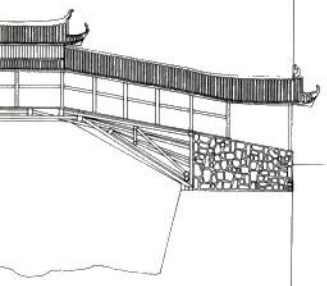
地理先生凭借手中的罗盘，口中念念有词，手中指指点点，却就如此将偌大的廊桥之桥堍、桥台以及桥梁的走向和方位都一一确定了下来。位于龟湖镇的城水桥桥屋大梁上就留有风水先生王石玉的名字。据说，在建城水桥之前，已经多次在此处建桥，可惜均毁于洪水。桥毁期间，乡民们一边用巨木搭起临时梁桥，权宜两岸交通；一边延请县内知名的龟湖风水名师王石玉到实地勘察选址。王石玉从风向、水害等方面考虑，最终确定桥址。经王石玉选址建成的城水桥一直安全地使用到了今天[3]。

当然，确定廊桥建造的地点并不一定非要地理先生来确定不可，只要拥有比较丰富的水文、地质以及工程经验的人都可担当。比如，三魁镇薛宅桥的重建就是由新上任的县令杨炳春确定的。据薛氏宗谱《重修锦溪桥记略》中记载，他亲身履勘，一路博询，认为如果建在大溪处，则"上面当风易坏，下面水势湍急，下桩不固。"如果建在小溪下，"则上面易于存风，下面水亦平稳，于此建桥，自可经久，且众议皆然。"

Feng-shui Master, i.e., Geography Master as mentioned above, has been a subject of controversial judgment in the present day as well as in the past.

It it not always the Mr. Geography who determines where to build a lounge bridge, but it must be someone with rich experience in hydrology, geology and construction engineering.

永庆桥
Yongqing Bridge



置办喜梁、祭河动工和上梁仪式

Beam Preparation, Sacrificial Rites, *Shangliang* Ceremonies

在中国传统的房屋结构中，称正房正中屋脊下的一根檩木（宋代称桁木）为栋梁。在泰顺山区的木拱廊桥的廊屋中同样位置的檩木也被当地人称为“栋梁”，福建省的宁德地区则称之为“喜梁”。因为栋梁所在的屋架结构中位置所处最高，故地位最高，所接受的待遇也最高。

建造廊桥将运用很多数量的木材，除栋梁外，其他材木可由乡民捐助得来，只要树种、规格和强度符合要求即可，其他则不太讲究。栋梁就不一样了，其用材以及选材则要严格得多，并且有一个专门挑选栋梁的仪式。必须是建桥首事亲自组织人员到山林中去选择栋梁之材。能被选为栋梁之材的树木必须满足下列条件：比如须是长在“洁净”之处。所谓“洁净之地”是指这棵树的周围没有坟墓、茅厕，树木的上方没有道路；被选中的树木必须是高大挺拔的杉树，在福建省的宁德地区则要选择三株或两株同根、枝叶茂盛之杉木。俗称“双胞柴”。在泰顺县，被选中做栋梁之树木要维持原貌，不能去皮（通常伐树后，都会剥下树皮才再扛下山），被砍倒后树木不能着地，须用木马支撑着，等待村里的有功名或是有身份的人来象征性地抬一抬，做起抬仪式，然后再由丁壮汉子抬下山。谁家山林里有树木被挑中做栋梁，主人不但不懊恼，反而会高兴，更是多捐些木材。理由很简单：因为自家山林里出了栋梁之材，不就意味着家族中的子弟成材之日不远了，能不开心吗？[4]在福建省宁德地区，伐木时要择吉日，须备“山礼”一担，“山礼”有公鸡一只、猪肉一块、素菜五碗以及茶和酒。并选择乡村中父母双全，三代同堂的“好命仔”四人去砍伐（四人代表东西南北四个方位）。砍伐前要在山上祭山神，将一担“山礼”的物品摆在要伐杉木旁边山地，并点烛焚香。所伐杉木要选择向山上方向放下（意为向上，避免“倒下”不吉利），还要在杉木将倒下的地方垫些树叶之类东西，（意为喜梁杉木不受玷污）。砍伐时，木匠师傅要喝彩，其他人随和喝彩，木匠念：

“右边发斧千年发（好啊！）/ 左边发斧世代兴（好啊！）/ 发天长地久（好啊！）/ 村村兴发、户户荣昌（好啊！）/财丁两旺、富贵双全（好啊！）”。

取杉木树尾木杈五至七盘，俗称“树绦”悬挂于喜梁当中（寓有头有尾，兴旺发达之意），并给喜梁披上红布，沿路鸣炮抬回，用三脚木撑将喜梁置于桥址旁边空地，绝对不能将之置于地上，以免被玷污。喜梁树皮削好，不能乱丢。可将树皮置高处晒干放锅中烧成灰作香炉灰用，也可倒溪中随水流走。作为喜梁的一根杉木，取好喜梁后，所剩之材要作为桥屋中神龛前边的左右两根

柱子。

喜梁的置办，表示造桥准备工作的开始。

农历秋分后的枯水期，河水流量不大，雨水也不多，是适合造桥的日子。造桥工程开工之初，是必须先进行“祭河”仪式。仪式较复杂，也比较固定：抬一头猪到溪边宰杀，然后将未死之猪放溪中，让猪血喷洒在溪水里，染红溪水，越红越好。而后，摆好猪头、公鸡、香烛、茶酒、果点、斋菜祭奠河神。此后凡遇初一、十五要小祭，平时每日要焚香。建造桥梁的福礼酒席一般为四次。

清咸丰三年（1853），邻省屏南县缘首张朝高等建造大峭桥，在造桥合同中约定“唯祭河、竖柱、上梁、完桥四次福礼。酒席并竹篾打铁系高（指缘首张朝高）办”。造桥还有月福的礼仪。清道光十七年（1837）造古田汤寿桥时，签订的桥合同中有“外约月福三次给钱壹拾千文又付君（指造桥工匠张成君）前去自备”，这月福三次包括每月农历的初一、十五两日，还有一次具体日子不详。

祭河仪式一结束，也就意味着整个造桥的准备工作完成，接下去就是正式造桥。

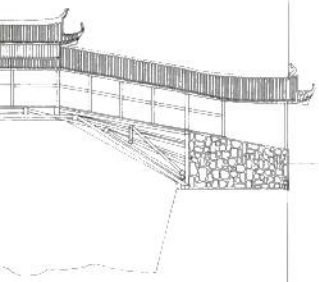
在中国传统的营造活动中，无论是房屋还是桥梁，在安装最后一根栋梁时总有一个非常隆重的上梁仪式。这个仪式既是庆贺房屋和桥梁大木构架的完成，又是预祝整个工程的顺利完满，乃至期望将来使用的完美以及给主事者、使用者带来好运和福气。在泰顺，有相当数量的廊桥直接委托福建省寿宁县的木匠师傅建造，寿宁与泰顺虽仅是一山之隔，在营造活动中浙闽两省的工匠也经常交流往来甚至合作共事，但其营造习俗也不尽相同，因此上梁仪式的程序也不完全一样。

寿宁师傅在木拱桥桥拱最后一根梁木合拢时有一个喝彩的仪式。

在通常的木拱桥建造过程中，第一步是立水柱架，其作用是来架好第一系统的三排拱骨，亦即浙闽地区工匠常说的三节苗。第二步就是架好第一系统，即三节苗。在架好三节苗的过程中，在安放平苗（亦即中间水平的拱骨）中间一根大梁时要举行祭梁仪式。2001 年 11 月，中国中央电视台为拍摄《虹桥寻踪》，请寿宁造桥工匠郑多金建造木拱桥，郑师傅在上梁仪式前，还到溪边的社主（俗称大王）处祭拜。在溪中摆一供桌，供品有香烛、茶酒、果点、斋菜，以及木匠造桥工具墨斗、斧头、凿子等。

祭梁由主墨木匠主持。点烛焚香上茶酒后，主墨木匠念：“一逢一、二逢一、三逢一，/ 吉日良辰天地开，阴阳相配大利此方。/ 谨请天皇銮驾到，谨请玉皇銮驾到，/ 太阳星君到，天智正马到，/ 传送正禄到，太阴星君到，/ 天乙星君到，鲁班师傅到，/ 贵人星君利，大吉星君到。/ 日子已定，时辰已到，鸣炮开发送上梁。”

◎ 廊屋内的楼梯
Staircase in a lounge house



仙居桥畔
Xianju Bridge

然后放鞭炮，同时由主墨木匠喝梁（喝彩）。造桥木匠转动天门车（旧时造桥用于调动木料的工具，其工作原理类似今天工程上利用卷扬机牵动钢绳吊动重物之起重机械），抽紧天门车缆绳，大梁徐徐上升。主墨木匠喝梁众人并同声喝彩："一来长命富贵（好啊！）/ 二来金玉满堂（好啊！）/ 三来三元及第（好啊！）/ 四来四季长春（好啊！）/ 五来五福长寿（好啊！）/ 六来积谷万仓（好啊！）/ 七来荣华富贵（好啊！）/ 八来承相同科（好啊！）/ 九来大发人丁千万口（好啊！）/ 十来十金大发永无疆（好啊！）/ 梁上金鸡来报晓，梁下玉鸡满千仓。华盖千秋火，富贵万年长（好啊！）。"

也有另一种喝梁（喝彩）："一敬梁头一盏酒，财丁两旺家家有（好啊！）/ 二敬梁尾一杯茶，家家户户闹喳喳（好啊！）/ 三敬梁中一盏酒，荣华富贵满堂红（好啊！）/ 四敬各位缘首、董事年年生贵子，户户中状元（好啊！）。"

在拱架上将三节苗中的平苗打入大牛头（浙闽山区的造桥工匠习惯将木拱桥两套结构系统中与纵向拱骨相垂直的横向拱骨称为牛头）的榫头时喝彩："拜鲁般仙师下凡来，保佑弟子上金榜。一要财丁两旺（好啊！）/ 二要金玉满堂（好啊！）/ 三要三元及第（好啊！）/ 四要四季吉祥（好啊！）/ 五要五福六寿（好啊！）/ 六要六国承相（好啊！）/ 七要七财八宝（好啊！）/ 八要八仙聚会（好啊！）/ 九要九子登科（好啊！）/ 十要十全大发（好啊！）。"

这些喝彩的语言形式虽然多种多样，但其核心内容无非就是祈求各方神灵保佑造桥工程的顺利进行以及保佑参与造桥人家的幸福吉祥。因此，从其出发点来说，它们是积极健康的。

In the traditional Chinese house structure, the purlin under the central roof of the room is the ridgepole of the house. The purlin of the lounge houses of the timber arch lounge bridge in Taishun mountainous area is also called a "ridgepole", and in Ningde region of Fujian Province, a "fortunate beam". As it rests at the highest point of the house, it takes the highest position and receives the highest respect, too.

The preparation of the fortunate beam marks the beginning of bridge building.

Prior to the construction project, a sacrificial offering to the river god will have to be held - A pig will be by carried to the riverside to be killed and then, before it dies, dropped in the river, so that its blood sprinkles in the water. It is meant that the water becomes as red as possible. The sacrificial offering also includes the rituals of laying offerings, such as a pig's head, a cock, joss sticks and candles, fruits and dim sum, etc.

The preparatory work is done when the sacrificial rituals end, when the formal construction of a bridge commences.

In the Chinese tradition of construction, either of a house or a bridge, the last beam is always put up accompanied by a grand ceremony, which is a celebration for the completion of the major part of the house or the bridge, and a good wish for the successful ending of the project, its proper use and for the luck and fortune to be brought to its sponsors and users.

霞光桥
Xiaguang Bridge

“抛梁”和“圆桥”

Paoliang and *Yuanqiao*: Ceremonies for Completion of a Bridge

在泰顺县建造廊桥时，上梁的高潮是抬梁上柱架的时候。此处以泰顺泰福桥的营造为例来谈谈颇为特别的“抛梁”仪式。

年逾八旬的董直机是泰顺县尚健在的为数不多的造桥工匠之一，就是他当时以主墨师傅的身份主持建造了泰福桥。上梁时，他带动副墨喊着诸如“国泰民安”、“五谷丰登”之类吉祥语，同时还要指挥大家将栋梁两端的梁头安放到准确的卯口位置。在上梁结束后，随即进行“抛梁”的仪式。主墨师傅站在梁木上，一边念着吉祥语，一边将挂在栋梁上的七宝袋抛到铺在地上的布单上。传说抛梁习俗起源于姜太公，诸神都是姜太公所封，人们认为诸神地位都在姜太公之下，所以他的神位应在最高的梁木——栋梁上。这也是许多人家上梁时都写一张“姜太公在此”的红条幅贴在梁上的原因，他们希望通过抛梁方式用七宝袋内之物敬奉姜太公，祈求得到他的佑护。正式抛梁后，建桥首事须将七宝袋在家里存放七天七夜，然后再将这些敬奉过神灵的七宝袋内的灵物：银、铜、铁、油酥、花生、枣、米等分给村内的各户人家。七宝袋内的物品各有吉祥的寓意。

建桥前有奠基破土仪式，桥成后则必定有“踏桥”、“踩桥”、“圆桥”、“初渡”等仪式。在中国的广东省、陕西省和四川省等地流行“踩桥”典礼，而在浙江省泰顺县的传统桥梁营造中，则通行“圆桥”仪式，可以说它是踩桥典礼的另一种地方类型。

在当地乡民看来，举行圆桥仪式，为的是讨个好彩头，希望桥梁永恒长久。对于营造桥梁的工匠们来说，只有经过圆桥仪式之后，廊桥才算是完全和真正的竣工。不仅是泰顺，在浙江的其他地方，都会在新桥建成之后，还有摆一次“圆桥酒”的风俗。显然，圆桥仪式与婚俗中的圆房，具有类似的象征意义。在圆桥仪式中，桥梁被视为生灵之物，它的生命可以因仪式而延续永久[5]。

After putting up the beam, the ceremony of *Paoliang* ("throwing offerings from the beam") goes. The master line marker will stand on the beam and, murmuring the incantations, throw a bag of jewelries and foods to a cloth sheet spread on the ground. The jewelries and foods contained in the bag are to be offered to Jiang Taigong, a famous ancient strategist who can drive away evil spirits in Chinese folklore, as a prayer for his protection.

When the bridge is finally constructed, *Yuanqiao* ceremony for completion of the bridge will be held in hope that the bridge will stand forever. For bridge builders, a lounge bridge is not truly complete without the ceremony for its completion. It has the similar symbolic meaning to that of the ceremony at the wedding. At the ceremony, a bridge is regarded as a life, which can live longer after such ceremony.

【注释】

①为泰顺县建造木拱廊桥的工匠绝大多数来自福建省，故现在存世的桥批大多数也是从福建东北部山区民间征集来的，现收藏于寿宁县文博馆内。

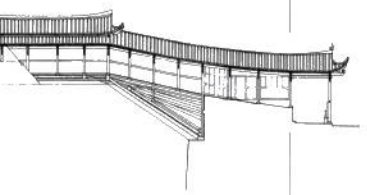
②择日吉课，是择日先生为建造木拱廊桥所选定的建桥重要环节的日程安排，黄道吉日的文书。

③④参见《泰顺廊桥网》薛一泉撰文“泰顺廊桥”。

⑤参见周星著《境界与象征：桥和民俗》第220页，上海文艺出版社，1998年版。

营造廊桥的工匠

Craftsmen Who Constructed Lounge Bridges



千年来，在山高林密的浙闽屋脊，就一直延续着砍树架桥、斫石铺路的营造传统。许多村子里，都专门辟有为造桥、修桥储积木材的桥山，除非修造桥梁，任何人都不得以任何理由进山砍树伐木[①]。浙闽山区木材储备丰富，一般山流溪涧跨度不大，木材的结构性能正适宜建造如此跨度的桥梁。浙闽山区桥梁的建造方式有民建，同姓家族合建，也有募捐集资的，还有官倡民修或全由官方建造的。自古以来，修桥铺路都是公益善举，更是地方官吏的职责所在。因此，在方志中，桥头所立的功德碑上，或是族谱里都能找到修桥造桥的缘由事迹，记载都甚为翔实。然而，造桥工匠的情形则有所不同。除了部分古桥在桥屋上梁头题记对造桥工匠之姓名、籍贯略有记载外，其余大多语焉不详，甚至有的只记录姓名，连工匠的家乡都不写录。要想弄清楚浙闽山区数以百计的木拱廊桥的建造细节、风俗传统如何，就必须弄清楚建造它们的工匠的详细情况。

对薛宅桥的考察发现造桥工匠线索

Xuezhai Bridge: A Clue to Bridge Craftsmen

薛宅桥位于泰顺县三魁镇的锦溪上。锦溪的两岸分别住着薛氏和张氏两族人家。围绕建造木拱桥，薛、张二姓进行了旷日持久的对抗，最后直至官府两度干涉才有了结果。正是因为有了张氏合族的坚决抵制，这才引出了福建寿宁的造桥工匠——徐元良赴三魁营岗店建造木拱桥的故事。

据薛氏宗谱《重建锦溪桥记略》一文记载：初建于明正德壬申年的锦溪桥，“东跨营岗山麓，西接水尾松林”，万历己卯年后遭水患被毁，薛氏族人下定决心，计划在原锦溪桥旧址再造蜈蚣桥（泰顺当地对木拱桥的俗称）。但遭到邻族张氏以风水被坏为由横加阻拦，后经新到县令杨炳春的支持，并亲自选定建桥地点才得以实现。

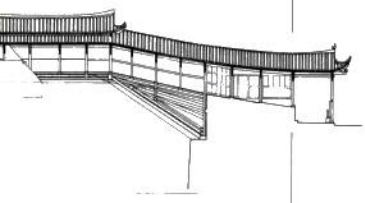
薛宅桥在福建寿宁造桥名匠——徐元良的主持下，副墨为陈泽应、郑福寿、郑起鉴、薛思年（薛思年是出自薛家的木匠），历时近半年的营造，终于建成。桥的两岸就是营岗店的老街，老街是依水而建的，溪水离岸并

◎ 溪下桥
Jixia Bridge

Xuezhai Bridge lies on Jinxi River of Sankui Town in Taishun County. On both sides of Jinxi River lived respectively the two families of Xue and Zhang. These two families had a prolonged fight for whether the timber arch bridge should be built before the local government stepped in. It was due to the objections raised by the whole family of Zhang that Xu Yuanliang, a bridge craftsman from Shouning of Fujian Province, came to Sankui for the construction of the timber arch bridge.

◎ 从中发现造桥工匠线索的薛宅桥
Xuezhai Bridge, where a clue of bridge craftsmen was found

不高，为了确保木拱桥在洪水来袭时的安全，徐元良抬高了木拱桥的两个岸基，于是薛宅桥就形成了今天所见到的样子：中部平而两端坡道较陡，坡度大约30°桥的两端接以长长的大石阶，行走较为不便。天长日久，老街的中央有一跨溪高高拱起的风雨廊桥也竟然成了三魁镇的标志。



营造木拱廊桥的著名工匠——徐郑世家

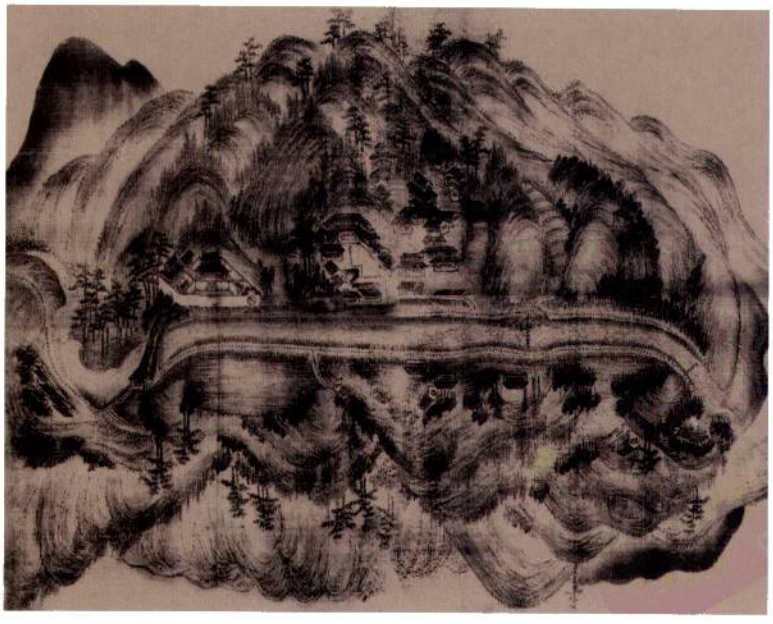
Xu-Zheng: A Family of Timber Arch Lounge Bridge Construction

在浙闽交界山区现存的木拱廊桥中，根据桥上栋梁题刻还能追查得到的工匠下落并不太多，年代也并不久远。而以徐元良为首的徐郑造桥世家的发现，可以说是调查浙闽木拱廊桥营造工匠的重要突破，也是了解清末、民国直至建国初期的浙闽山区木拱廊桥营造详细情况的重要线索。至此，对木拱桥的考察和研究可以从不能开口说话的文物建筑、家谱文献中转入到活生生的工匠群体本身开始。

徐元良、郑惠福一系之造桥工匠个人档案：

徐元良（生卒无考），福建省寿宁县坑底乡小东村人氏，师承何人待考。清咸丰七年（1857）主持建造浙江泰顺三魁薛宅桥，绳墨[2]。

徐斌桂（1828－？），徐元良长子，师徒关系。清咸丰七年（1857）



薛宅桥与锦溪两岸的村落宅舍（摘自《薛氏宗谱》）
Village residences along Xuezhai Bridge and Jinxi River (from *Genealogy of the Xue Family*)

From the carvings on ridgepoles of the many existing timber arch lounge bridges in Zhejiang-Fujian mountainous area, we can find out little information about the lives of the bridge craftsmen of the remote past. One of the most significant breakthroughs in the research of the craftsmen of timber arch lounge bridges in Zhejiang-Fujian area is the findings about Xu-Zheng Family of Bridge Construction led by Xu Yuanliang, which is also an important clue for studying the construction science of timber arch lounge bridges in the late Qing Dynasty, the ROC and the early period of PRC in Zhejiang-Fujian mountainous area.

Personal data of Xu Yuanliang - Zheng Huifu bridge craftsmen:

Xu Yuanliang (birth date unknown), born in Xiaodong Village, Kengdi Township, Shouning County, Fujian Province, whose teacher is pending for further study. He headed the construction of Xuezhai Bridge in Sankui, Taishun, Zhejiang Province as a master line marker in 1857.

Xu Bingui (1828-?), first son of Xu Yuanliang, as his apprentice. He assisted Xu Yuanliang in the construction of Xuezhai Bridge (now existing) in Sankui, Taishun, Zhejiang Province in 1857.

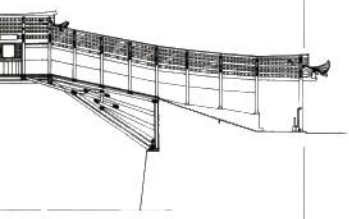
Xu Shiren (1857-?), first son of Xu Bingui, as his apprentice.

Xu Shili (1863-?), third son of Xu Bingui, as his apprentice.

Xu Shizhi (1869-?), fourth son of Xu Bingui, as his apprentice.

Xu Zechang (1892-1951), also known as Zexiang, first son of Xu Shizhi, as his

◎ 廊桥营造工匠郑多雄、郑多金（中）、郑多希
Craftsmen of lounge bridges: Zheng Duoxiong, Zheng Duojin (middle) and Zheng Duoxi



协助徐元良建造浙江泰顺三魁薛宅桥。

徐世仁（1857 —？），徐斌桂长子，师徒关系。

徐世礼（1863 —？），徐斌桂三子，师徒关系。

徐世智（1869 —？），徐斌桂四子，师徒关系。

徐泽长（1892 —1951），又名择祥，徐世智长子，师徒关系。

郑惠福（1895 —1978），福建省寿宁县坑底乡东山楼村人氏，为徐泽长外甥，师从徐泽长。1948年建泰顺县三滩桥，该桥1950年毁于洪水。1953年建泰顺县仕阳双神桥。1954年建红军桥，该桥位于寿宁与泰顺交界的山溪之上。1963年建泰顺县富家垟桥。

郑多金（1929 —），郑惠福长子，师徒关系，至今健在。1948年建泰顺县三滩桥，1950年桥毁于洪水。1953年建泰顺县仕阳双神桥，桥已毁。1954年建红军桥，横跨寿宁与泰顺交界的山溪之上。1963年建浙江省泰顺县富家垟桥。

郑多雄（1953 —）郑惠福三子。多金徒弟，至今健在。

另有：

郑福寿，清咸丰七年（1857）建浙江省泰顺县薛宅桥，副墨。

郑岩福（1919 —1999），木匠，徐泽长外甥，师徒关系。民国二十八年（1939）建寿宁单桥（现存），1948年建浙江省泰顺县三滩桥，1950年桥毁于洪水。

郑多希（1943 —），郑岩福子，师徒关系，至今健在。

徐郑世家从徐元良一代算起已传了二姓六代共110年，培育出桥梁工匠十数余人，地域横跨闽浙两省之寿宁县、福安市（闽）、泰顺县、庆元县、景宁县和文成县（浙）六县市。郑惠福、郑多金父子两人在浙闽山区共建造木拱桥18座，在泰顺一地就有5座。毫不夸张地说，从清代至20世纪60年代以来，寿宁徐郑造桥世家俨然成为浙闽山区廊桥营造活动中一支非常重要的力量。

apprentice.

Zheng Huifu (1895-1978), born in Dongshanlou Village, Kengdi Township, Shouning County, Fujian Province, nephew of Xu Zechang, as his apprentice. He headed the construction of Santan Bridge in Taishun County in 1948, which was destroyed by the flood in 1950. He headed the construction of Shuangshen Bridge in Shiyang Town, Taishun County in 1953, which was also destroyed. He headed the construction of the Red Army Bridge (now existing) in 1954 on the river at the border of Shouning and Taishun. He participated the construction of Fujiayang Bridge in Taishun in 1963.

Zheng Duojin (1929-), now living, son of Zheng Huifu, as his apprentice. He participated the construction of Santan Bridge in Taishun County in 1948, which was destroyed by the flood in 1950. He participated the construction of Shuangshen Bridge in Shiyang Town Taishun County in 1953, which was also destroyed. He participated the construction of the Red Army Bridge (now existing) in 1954 on the river at the border of Shouning and Taishun. He participated the construction of Fujiayang Bridge in Taishun in 1963.

Zheng Duoxiong (1953-), now living, third son of Zheng Huifu, as apprentice of Duojin.

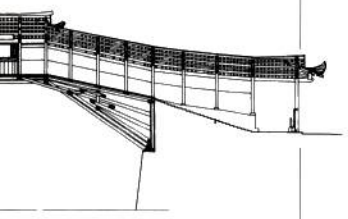
Additional people:

Zheng Fushou, who participated the construction of Xuezhai Bridge in Taishun County as an assistant line marker in 1857.

Zheng Yanfu (1919-1999), carpenter, nephew of Xu Zechang, as his apprentice. He participated the construction of Shouning Dan Bridge (now existing) in 1939. He participated the construction of Santan Bridge in Taishun County, Zhejiang Province in 1948, which was destroyed by flood in 1950.

Zheng Duoxi (1943-), now living, son of Zheng Yanfu, as his apprentice.

Xu-Zheng Family of Bridge Construction has continued for 110 years, calculated from Xu Yuanliang, involving two families and six generations, fostered more than ten bridge craftsmen, covering a wide geographical area of six counties or cities, i.e., Shouning County, Fu'an City (Fujian), Taishun County, Qingyuan County, Jingning Couty and Wencheng County (Zhejiang). Zheng Huifu and his son Zheng Duojin constructed 18 timber arch bridges in Zhejiang-Fujian mountainous area, in which 5 are in Taishun. It may be well said that Xu-Zheng Family of Bridge Construction in Shouning has been a very important team in the lounge bridge construction in Zhejiang-Fujian mountainous area from the Qing Dynasty till 1960s.



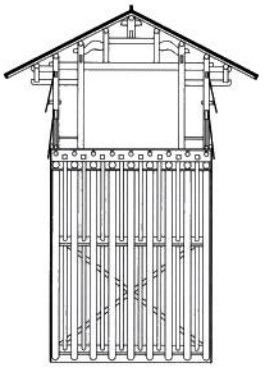
徐郑世家营造木拱廊桥的技术特色

Features of Bridges Constructed by Xu-Zheng Family

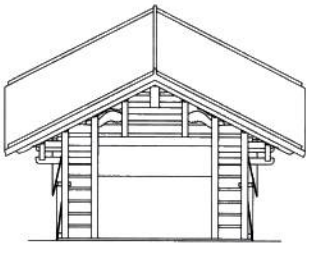
自徐元良所造三魁薛宅桥以来，徐郑一脉所造木拱廊桥不下数十座，时间跨度近一个半世纪。在徐郑工匠世系里，中国传统的父子相承式的建桥手艺的传承，也形成了他们相对稳定的木拱廊桥营造技术特点。根据调查和研究，我们发现了以下几个特点：1．除运用形成编木拱梁结构的两套系统外，还比较多地运用抵抗侧向位移的斜十字剪刀撑结构。2．形成编木拱梁结构的第一、第二两套系统在空间排列布置上与其他造桥匠师的做法不同。3．第一系统斜拱杆（三节苗）拱脚直接支承于桥台顶帽石上。

寿宁小东的徐郑造桥工匠世家营造木拱桥梁的技术特点远不止上述这些。但是，可以窥斑见豹。从以上的几个技术特色来看，到了清末民国以后，浙闽地区的造桥工匠们逐渐将木拱桥的技术走向实用、经济，考虑美观则在其次。

Since Xu Yuanliang built Sankui Bridge and Xuezhai Bridge, Xu-Zheng Family had constructed over 10 timber arch lounge bridges in nearly 150 years. The traditional Chinese type of inherited craftsmanship handed down from fathers to sons, as represented by Xu-Zheng Family of Bridge Construction, is identical with the comparatively stable characteristics in their construction technology of timber arch lounge bridges. Investigation and research reveal that these bridges have the following features: (1) apart from using the two systems comprising of a woven timber arch-beam structure, the inclined X-bracing structure is often used to prevent sidelong deviation; (2) the spatial display of the two systems comprising of a woven timber arch-beam structure is different from that of other bridge craftsmen; and (3) the arch springers of the inclined arch bar of system I (triple articulation arch) rest directly on top of the bridge abutment.



红军桥横剖面图
Transverse section of Red Army Bridge



红军桥侧立面图
Transverse elevation of Red Army Bridge

泰顺其他廊桥营造匠师

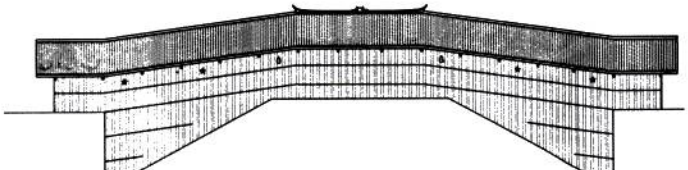
Other Bridge Craftsmen in Taishun

毋庸怀疑的是，在拥有千百座廊桥的泰顺县的历史上肯定活跃着一批批营造匠师，他们或师徒相承，或父子相继，使得廊桥的营造技术不断继承和向前发展。可惜的是，不知是何原因，我们在现存的廊桥题刻和其他文字资料中能够找到的泰顺籍的工匠少之又少，尤其是营造木拱廊桥的工匠。

在薛宅桥的几次重建中，曾经出现过一些工匠的名字，除去徐元良一系外，还有吴光谦、薛思年二位。薛思年是薛氏族人，在《薛氏宗谱》中有简单记载，但这位木匠并无子嗣，大约在中年时迁到了一个叫赤岩前的村子里居住，此后再无消息。

岭北村尾村年逾八旬的木匠董直机是泰顺目前硕果仅存的能用传统营造方法建造木拱廊桥的匠师。他在邻县寿宁学到建桥技术。回到泰顺后，董直机又正式学习木匠手艺，掌握了大木技术。

泗溪镇有两座木拱桥，可惜一直没有建桥工匠的记录。最近几年，随着公众对桥梁的日趋重视，也影响着南溪的一位年轻木匠，他的名字叫曾家快。前几年，他花了三个月的时间将30年来无数次上上下下的木拱廊桥彻底琢磨个遍，并用木头做了一个1.5米长的木拱桥模型送给了就在下桥村的泰顺廊桥博物馆。2003年秋天，他又独自募集了十余万的资金，一个人造起了一座十余米长的木拱廊桥于南溪之上。虽然他的木拱廊桥的技术是无师自通的，他的师傅就是活生生的木拱廊桥，但他也算是目前泰顺最年轻的造桥匠师了吧！



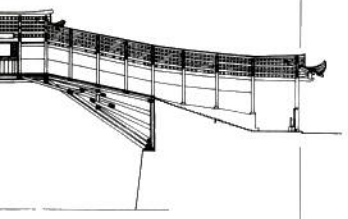
◎ 红军桥正立面图
Longitudinal elevation of Red Army Bridge

◎ 红军桥纵剖面图
Longitudinal section
of Red Army Bridge

【注释】

① 2001年暑假，作者带领交通大学建筑系学生在丽水地区的庆元县考察木拱廊桥时，在与同当地文化部门的同志以及在乡村民交谈时得知。

②文中绳墨、主墨、副墨、木匠等均为桥中木梁下皮墨书造桥工匠的称呼，绳墨、主墨、木匠等为桥拱架设计师，俗称“大师傅头”，副墨等为副手。



廊屋中的祭祀

Sacrificial Rites in Lounge House

在泰顺规模稍大一点的廊桥中，都设有神龛供乡民祭祀。也有的并不设在桥屋中，偏在一旁，或正对桥头路冲。总之，桥与庙的紧密结合成了泰顺乃至浙闽山区的一大特色。有重屋的木拱桥更是祭祀的理想场所，在泰顺，乃至整个浙闽山区的木拱廊桥中都设有神龛、甚至庙宇，并且神龛必定是设在靠下游溪水的一侧，神像面对着趟来的流水。如此设置有其寓意，神本身的价值之一就是为了镇住来水，保佑廊桥平安。当然，乡民们在此祭祀的目的并不仅仅是护佑廊桥，他们更关心自己的生活及前程。因此，廊屋中祭祀的对象内容很广泛，有佛、道、儒三教中的人物，佛教中如观世音菩萨等，道教中的诸神最多，尤其是地方上的杂神，比如五显神、陈十四夫人、马仙姑、忠烈王等，以及能给读书人带来好运的文昌帝君和帮人发家的财神爷赵公明也很普遍。

洲岭乡的毓文桥，是一座木石结合的廊桥，它的下部桥身是由一个半圆形的石拱构成，桥上却设有三重檐的廊屋。二层的廊屋就是专门供奉文昌帝君的庙宇，当地人称文昌阁。桥堍旁就是两棵参天的古树，一棵是樟树，半掩着廊桥，款款相依；另一棵是松树，犹如擎天巨伞，意欲为桥遮风蔽雨。从桥的下游回头望去，古树掩映下的毓文桥在近处斑驳的岩石衬托下，一抹白练从岩石中飞泻而出……这意境也只能出自中国特有的山水画吧！

南溪桥恐怕是泰顺廊桥中供奉神仙塑像最多的一座。神龛当中祭祀的一尊是马仙姑，左边依次是马仙姑夫家阿爸、叶都元帅和五显灵官，右边依次为马仙姑娘家阿爸、行雨龙王和土地公，在诸神两旁守护着的是千里眼和顺风耳。特别值得一提的是，在大神龛旁还设有一座小小的神龛，里面供奉的是观世音菩萨。小小的一座风雨廊桥，竟然挤着十余尊佛、道两教各路神仙，接受着泰顺乡民的顶礼膜拜，同时，它们也将含笑的目光赐予给这些虔诚的人们，帮助他们度过一个个难关，抚慰平一次次伤心和苦痛。

每年农历七月七是南溪桥桥祭的日子。祭桥的文书叫做“七夕文疏”，常年主持祭桥的旸师还保存着手抄本的文疏，其中写道：1. 上祖创立宫庙，庄塑真仙佛像一堂，递岁祀奉香灯；2. 集福七夕，庆旦清福，净供一筵，处备香灯茶果；3. 宣封懿政马氏嘉祐真人圣前，恭望真仙列慈下临；4. 众等所种田园早禾苗六种在洋，正当茂盛，衔花吐穗，结实之际赖圣驱除蝗虫、鼠疫无惹害，山猪麂鹿逐远遣，地鸟野兽永无迹。禾苗清秀雨均，田园六种全收熟，五谷丰登茂盛降瘟疫，豺狼虎豹远他乡，童子老迈男康女泰，风调雨顺国泰民安，福无疆。六畜多兴旺，合村宅舍得太平，诸般等事大吉祥[①]。 祭桥实际上是乡民们借“桥”发挥，从桥为出发点，实际上祭出的是自己生活的希望。

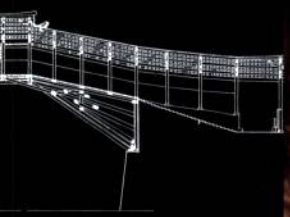
泰顺规模稍大一点的廊桥中，都设有神龛供乡民祭祀。图为刘宅桥、文兴桥中所设的神龛。

On any lounge bridge of a larger scale in Taishun, there is always a shrine of idols for villagers to offer sacrifice to. The pictures show the shrines of idols on Liuzhai Bridge and Wenxing Bridge.

On any lounge bridge of a larger scale in Taishun, there is always a shrine of idols for villagers to offer sacrifice to. The shrine may be arranged in the lounge houses or next to the bridge or facing the entrance of the bridge. In general, the combination of bridge and shrine is one of the significant features in Taishun as well as Zhejiang-Fujian mountainous area. A timber arch bridge with a double house is particularly an ideal place for offering sacrifice. In Taishun, especially in Zhejiang-Fujian mountainous area, a timber arch lounge bridge is always built with a shrine or even a temple, and the idol always rests by the side of the lower reaches, facing the river flow. This arrangement has a special meaning, for one of the values of the idol is to resist the water flow and bring peace to the lounge bridge. The purpose of offering sacrifice by the villagers is not, of course, only for the safety of the bridge itself, but also their own personal life and prospect.

The villagers offer sacrifice to the bridge as a symbolic activity, in which the bridge is only a symbol or a vehicle that embodies their wish for a better life.

◎ 设有专门供奉文昌帝君庙宇的毓文桥
Yuwen Bridge, where rests the Temple for Emperor of Wenchang, a legendary person in charge of human knowledge



南溪桥是泰顺廊桥中供奉神仙塑像最多的一座。小小的一座风雨廊桥，竟然挤着十余尊佛、道两教各路神仙，供泰顺乡民的祭祀。

Nanxi Bridge is the bridge that has the largest number of worshiped idols among lounge bridges in Taishun. In such a small lounge bridge, there are tens of idols, either Buddhist or Taoist, are worshiped by the villagers in Taishun.

【注释】

①参见薛一泉先生在《泰顺廊桥网》上“泰顺廊桥”一文。

廊桥、古道、人家

Lounge Bridges, Ancient Paths and Villagers

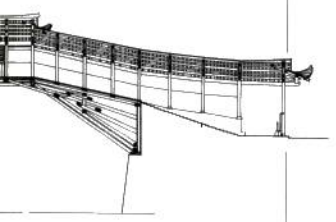
泰顺独具风格的道路、桥梁构成了当地主要的交通系统，依山建筑的民居也别具特色。古代道路、桥梁以及形形色色的民居是当地历史经济的产物。大多数的古道、古桥和古民居在当今中国已经不复存在，但是在现代交通相对闭塞的泰顺，仍然保存有相当的数量。古代泰顺的交通以陆路为主，比较重要的古道有县治罗阳通往温州的“温州大道”，沟通浙闽两省的“桐山大路”。这两条道路相当于清代的道路网系统“官马大道”、“大路”、“小路”三等级中的“小路”级，即自大路或各地重要城市通往各市镇的道路[①]。

The characteristic paths and bridges in Taishun constitute the major traffic system of that region, and the residential houses by the hills are just as characteristic. The ancient paths and bridges as well as the residential houses are the historical and economic outcome of the region. Most of them are no longer existent elsewhere in China today, but they still exist in a considerable number in Taishun, whose geographical location is still out of the way.

南溪桥
Nanxi Bridge

古道和廊桥

Lounge Bridges and Ancient Paths



泰顺现存的古道，很大一部分都连着廊桥。比如登云桥，因其位于县城罗阳镇南门，因此又叫“镇南桥”，是泰西南部进城及县城通往寿宁的重要桥梁。刘宅桥地处要冲，在未有泰鼎公路前，是泰顺往来福建福鼎的必经之津梁。三条桥，据说此桥最早曾用三条巨木跨溪为桥而得名，还有另外一种说法，是因它连接着两边桥头的三条古道，所以才称为“三条桥”。

“温州大道”罗阳至仙居的一段，沿途还遗存了许多路亭和桥梁。仙居清代文人张天树就曾作一首长诗描绘古道景物，诗云：“罗山日暖春花吐，迎春门接仙源路。三阳过处是石亭，杨柳湾深锁烟雾。高低岭尽见清溪，长空一道飞虹度……”“三阳过处是石亭”，始建于明正德十年（1515）的单间石亭伫立在山间已经经历了480多年的风风雨雨。过了石亭沿着逶迤陡峻的石阶山道往下行，经岭下村往仙居方向行走，在山谷处便可望见山涧上的石板桥，桥体结构较为罕见。桥面石板并非直接铺设在桥墩之上，而是在桥墩之间运用了伸臂的梁层层出挑，借以减少桥板的实际跨度，真是别具匠心。过得石桥，再行不久，便是“高低岭尽见清溪，长空一道飞虹度”闻名遐迩的仙居桥到了。据林鄂《分疆录》记载，仙居桥为“明知县郭显宗建，成化十九年六月洪水冲毁，弘治四年知县范勉重建，嘉靖三十九年崩圮，四十二年知县区益重建，今康熙十二年正月里人复造之”。 建在泰顺通往府城的“温州大道”上的仙居桥“外达温州，洵为要津”。如果桥梁毁坏，则“临流病涉，行者苦之”。从明景泰年间始建开始至清康熙年间，仙居桥历经四次修建，说明了它在泰顺对外交通中无可替代的重要地位。

坐落在“桐山大路”上的普宾桥，从民国至建国初期，一直都有以挑担为营生的脚夫经过歇息。他们从十几岁就开始如此的营生，奔走于福建桐山和浙江泰顺两地的行商挑担。从桐山挑海鲜到泰顺县城罗阳，再从罗阳扛木材到桐山，两边都不落空。挑担人必须具备非常好的脚力，从桐山出发要一天一夜才能到达罗阳，中途不能有太多的休息。古道旁的路亭和廊桥就成了他们休憩的好地方，渴了喝些路亭边的井水或免费的茶水，饿了就在桥屋内买几块米糕或吃几口自备的干粮。肩上的货物必须按时被他们挑到罗阳，否则会误了罗阳店铺的早市。挑担人从桐山到泰顺罗阳跑一趟有五块钱的收入。当时两块钱便能买一担粮食，可以想像这五块钱对当时的庄户人来说是一个多么大的诱惑啊。但是，挑担人干的是长途跋涉的体力活，他们生活的艰辛非常人所能受。廊桥无语，廊屋中木椅板凳被挑担人的汗水浸渍得油光光的，便是明证。

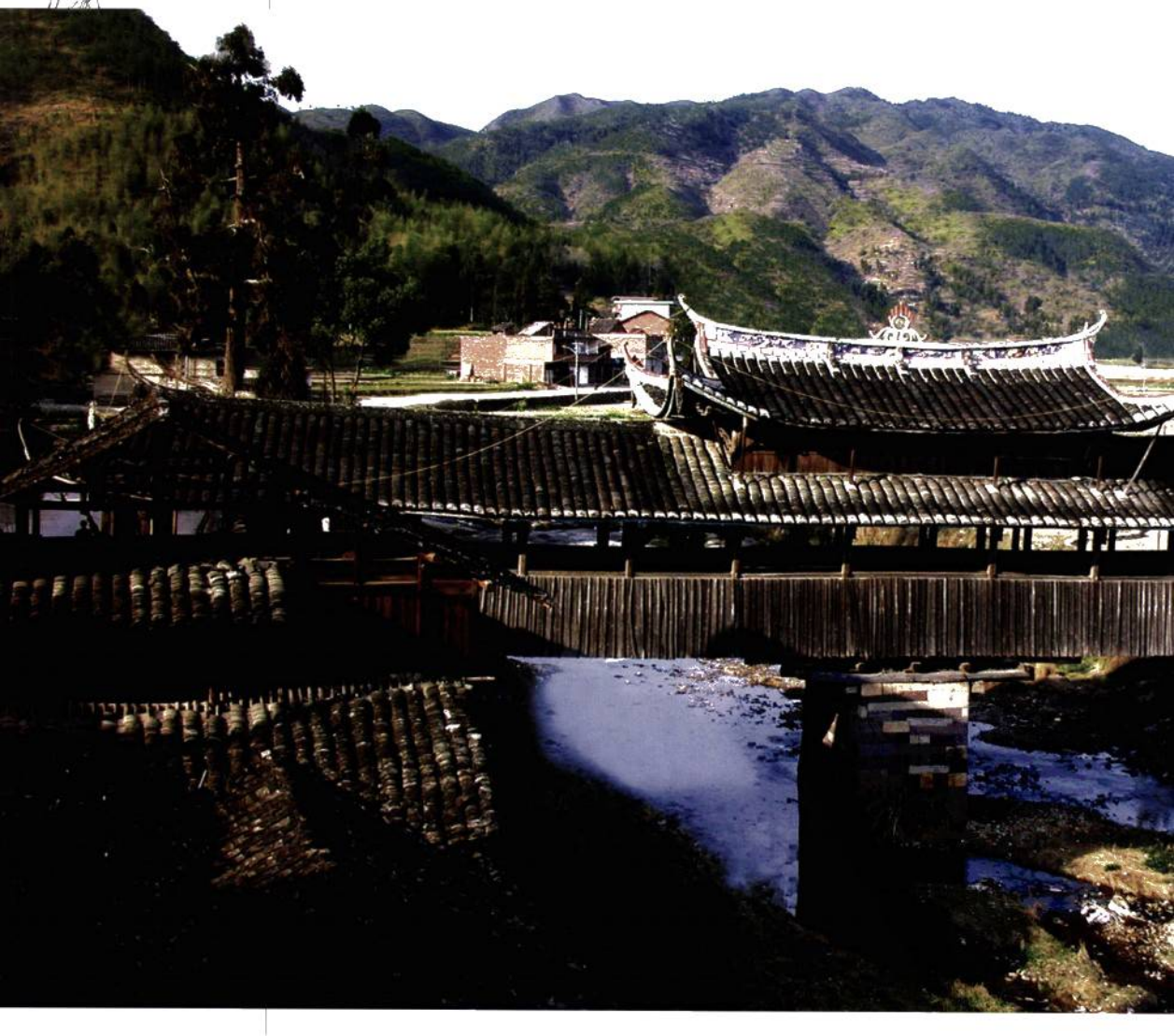
湍急的溪流
Torrent of water

泰顺山乡古道上的廊桥，至今有不少仍在发挥着交通的功能。筱村镇的

文兴桥，乡民外出或劳作都要经过它，桥屋里还有供人休息的长凳和求好运气的签筒，听说这儿的签一直都很灵验呢。夕阳西下，金灿灿的永庆桥倒映在水中，风采依旧。光阴荏苒几百年，物是人非，当初乐善好施的吴世江早已离开了人世，但经他主持兴建的永庆桥却至今还起着渡人的功用。还有人会念着他么[2]？

◎ 古老的祠堂、庙宇、道路和廊桥
Ancient ancestral halls, temples, paths and lounge bridges

The lounge bridges linking the ancient paths among the hills of Taishun are still a functional part to the regional traffic. Wenxing Bridge at Xiaocun Town is still used by the villagers going outside the village; people will sit on the benches in the lounge house or draw a bamboo slip ask divination, where it is said divination is often efficacious. When the sun is setting, the gilded Yongqing Bridge has a shadow in the river, shining the

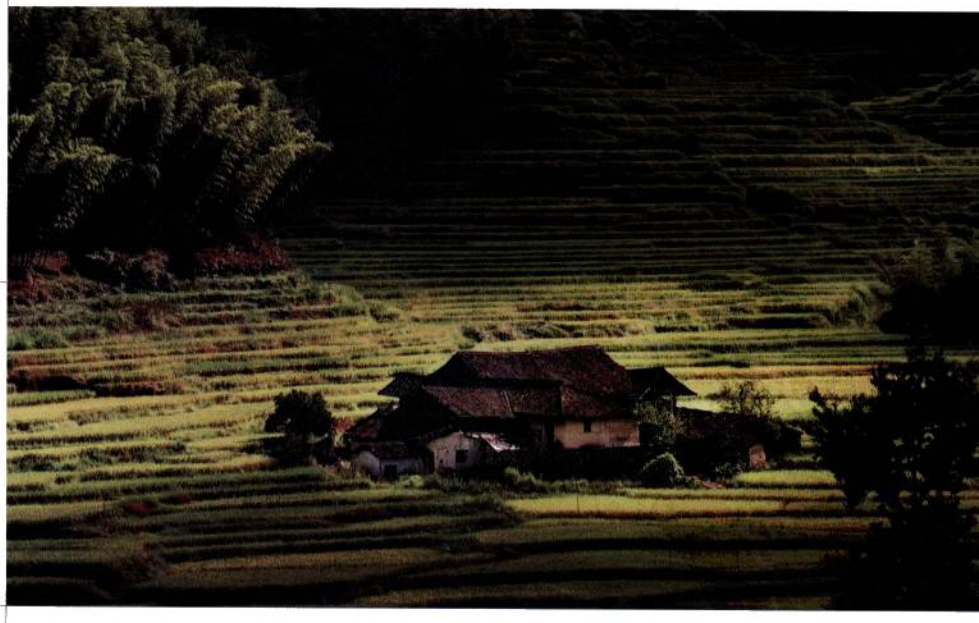


golden beauty it used to have. Now that hundreds of years have elapsed, Wu Shijiang, the one who loved to good for others, has long been in heaven, but the bridge of which he headed the construction, is still in use. Is there anyone who still remembers him?

廊桥与古民居
Lounge bridges and ancient residences

廊桥和人家
Lounge Bridges and Villagers

由于泰顺山区复杂的地形地势限制，其传统民居的聚落形式较为单一，基本上都是一处一宅，宅与宅之间相距甚远。即使是同宗之宅，聚于一个山坳、一块平地，但也绝无房舍相通，大都处在相望而不能相连的状况。在这种较为孤立的聚落形态下，乡民们的交往似乎成了问题。尤其是异族之间的交往，在那封闭的乡土社会中显得更加的稀少。然而，问题在独特的环境下总会得到更加独特的解决方式。试想，在自给自足的乡土社会中，在一个多山多谷、多风多雨、多溪多涧的地方，大家伙都不住一块，一出门就有交通不便的问题。要是在这时，在几条山溪交汇的地方，一座巨大的廊桥如长虹卧波般横在宽阔的溪面上，有乡民在其间坐听风雨，也有的在其间买一盒火柴，划燃一支香烟……这是多么的惬意呀！在路过之间，便完成了物品的交换，也进行了不用上门的交谈，增进了情谊，互通了信息。这是一个多么浪漫而又实际的设想。泰顺的先民们硬是实现了这个梦。在泰顺，不知曾拥有过多少个如虹般的廊桥。



泰顺传统民居的聚落形式较为单一，基本上都是一处一宅，宅与宅之间相距甚远。
The simple way of settlement of the traditional residents in Taishun, which is basically one residence in one place and far detached from another.

The complicated topographical conditions of Taishun mountainous area result in an uncomplicated way of settlement of the traditional residents, which is basically one house in one place with a long distance between two houses. Even though a clan of families is concentrated down a valley or on a plain, each house is detached from another, though within an eyeshot. In this rather isolated mode of settlement, villagers may have difficulty in communication, especially between families of different clans in such a closed vernacular society. Special problems, however, have special methods for them. In this self-sufficient vernacular society, hilly, windy and rainy, with many rivers and creeks, people live far apart, and traffic is the topmost problem. What if there is a rainbow-like lounge bridge lying across a river where several creeks converge, and a few villagers sit there enjoying the whistling wind and dropping rain, buy a pack of matchbox, and then light a cigarette...What a comfortable moment! Commodities are exchanged along the road and a conversation occurs without having to knock at someone else's door, whereby friendship is also enhanced and information exchanged. This is a both romantic and practical idea. The villagers in Taishun eventually put this idea in practice, but we fail to know how many rainbow-like lounge bridges have ever existed in Taishun.

Xidong Bridge, also called informally the Upper Bridge, is located in the upper reaches of Dongxi Creek, some 200 meters to the west of Xiaqiao Village of Sixi Town. It is a woven timber arch-beam lounge bridge, 41.7 meters long, 4.86 meters wide, 10.35 meters high with a span of 25.7 meters. It was first built in 1570, refurbished in 1745 and repaired in 1847.

Beijian Bridge, also called informally the Lower Bridge, is located in Xiaqiao Village of Sixi Town, bearing 19 lounge houses and 88 pillars, 51.7 meters long, 5.37 meters wide, 11.22 meters high with a span of 29 meters; it has a double-eaved roof pavilion in the middle. It is a woven timber arch-beam lounge bridge. It was built in 1674 and refurbished in 1849.

Beijian Bridge and Xidong Bridge in Sixi Town are locally called "Sister Bridges", but in fact they should be called "master-apprentice bridges". These bridges share the same basic form. Beijian Bridge is the master's bridge and Xidong Bridge is the apprentice's bridge. The two bridges have been refurbished several times, thus are difficult to determine who of the master and the apprentice were responsible for the refurbishments to the bridges. According to the carvings on the bridge-end stele and on the bridges, Beijian Bridge was constructed in 1674 and refurbished in 1849; Xidong Bridge was constructed in 1749 and refurbished in 1849; they had been repaired several times afterwards and well preserved till this day.

Beijian Bridge and its surroundings are particularly beautiful. Two creeks converge

泰顺村童
Kids playing in the corridor

历经风雨的古廊桥
Ancient lounge bridge as timeworn

泗溪镇溪东桥和北涧桥就是其中的两座。两桥的结构形式与造型都基本相同，相距也不远，当地人都称之为“姊妹桥”。

溪东桥，俗称上桥，位于泗溪下桥村西200米的东溪上。系编木拱梁廊桥。始建于明隆庆四年（1570），乾隆十年（1745）重修，道光七年（1827）修造。全长41.7米，宽4.86米，高10.35米，跨径25.7米。

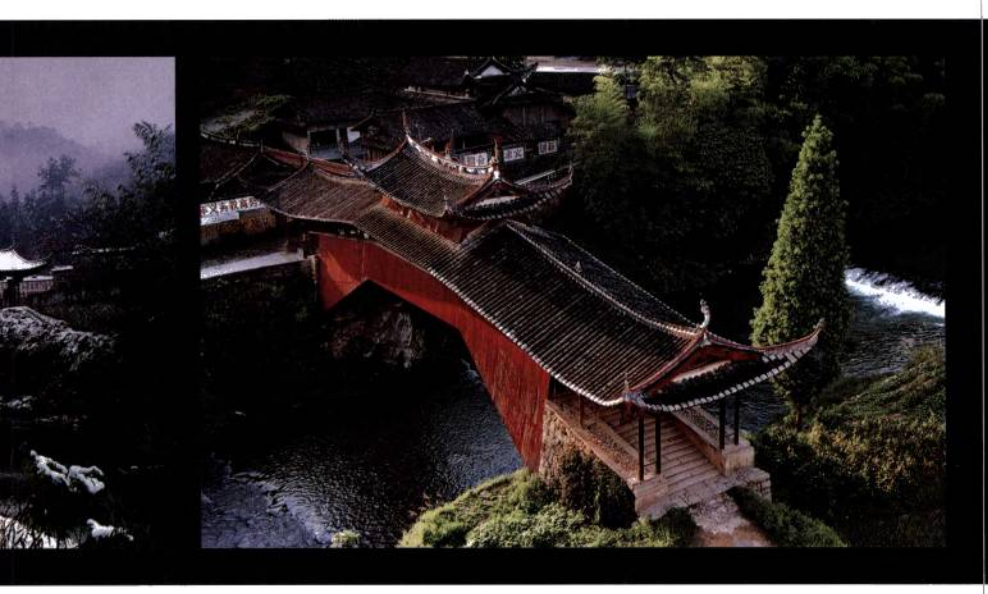
北涧桥，俗称下桥，位于泗溪镇下桥村。系编木拱梁廊桥。建于清康熙十三年（1674），嘉庆八年（1803）重修，道光二十九年（1849年）重修。全长51.7米，宽5.37米，高11.22米，跨径29米，桥屋19间，计88柱，中央有重檐阁楼。

溪东桥实际上应为东溪桥，因其横跨东溪水而得名。溪水过桥后转弯从桥南侧流过，溪水清澈。桥的另一侧为山，远景山势挺拔。此处有两座最高的山，一曰狮子山，一曰将军山。根据当地人讲，此桥及周围环境处于“将军逗狮”的风水宝地。在远山的衬托下，桥更显秀美，轻灵。在桥中央开间的藻井天花上，记有“清乾隆十年建造”的字样，从桥入口处三块石碑的碑文上看出，在清道光二十九年，此桥由民众捐资，经过了一次

重修。据当地人说，此桥比泗溪北涧桥略晚几年修造，分别在河的上游和下游，因此，一曰“上桥”，一曰“下桥”。溪东桥为上桥，北涧桥为下桥。

泗溪北涧桥与溪东桥被当地人称为“姊妹”桥，实际应为师徒桥。两桥结构形式基本相同。北涧桥是师傅桥，溪东桥是徒弟桥。但因这两

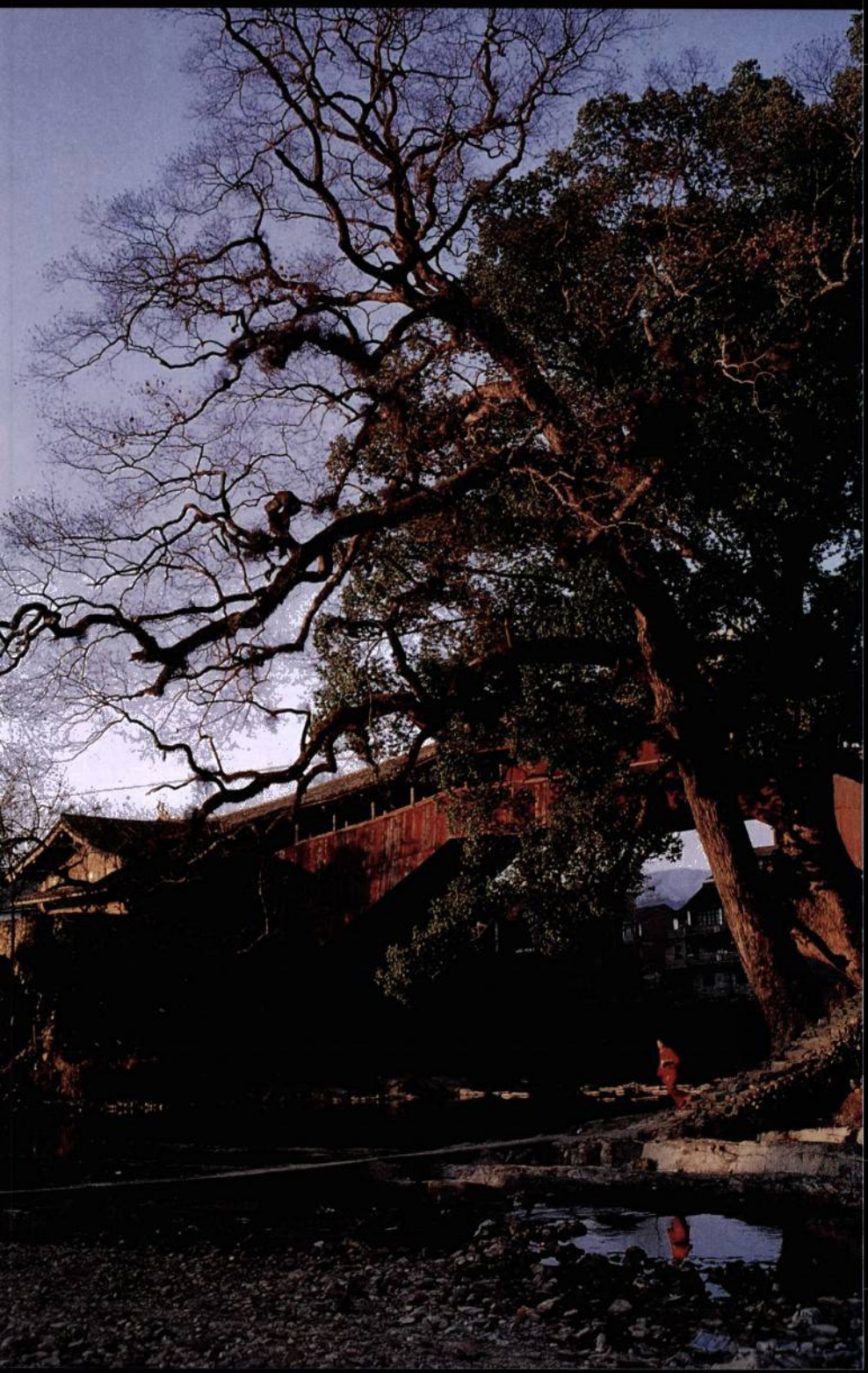
溪东桥
Xidong Bridge



溪东桥
Xidong Bridge

by the side of the bridge, where the flowing water is crystal and a little stone bridge of stone beams is put up, which connects to a block bridge (dingbu). When the water comes up, the entire stone bridge will be submerged. Along the creek, a narrow path leads the travelers to the bridge and the village. At the end of the bridge two tall camphor trees, which also represent the end of the village. The trunk of the larger tree has a diameter of

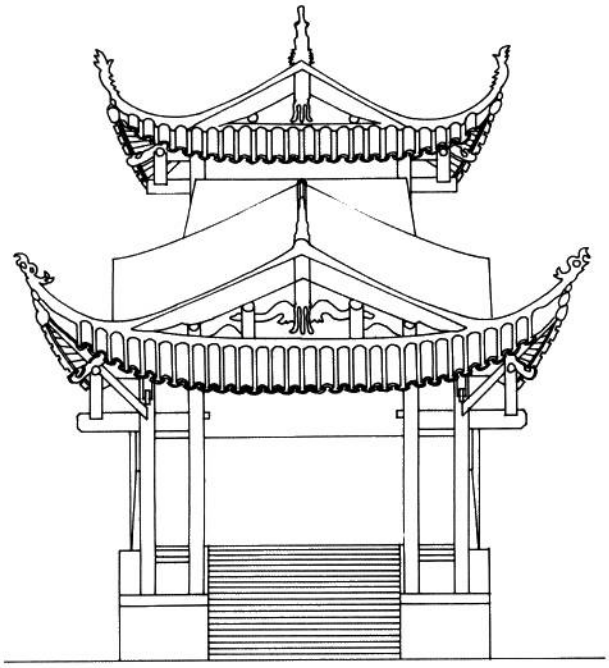
溪东桥廊屋内的藻井
Ceiling of lounge house in Xidong Bridge



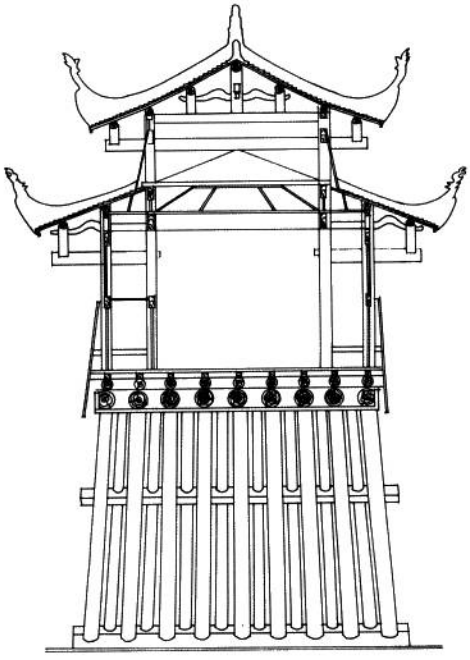
北涧桥
Beijian Bridge

北涧桥
Beijian Bridge

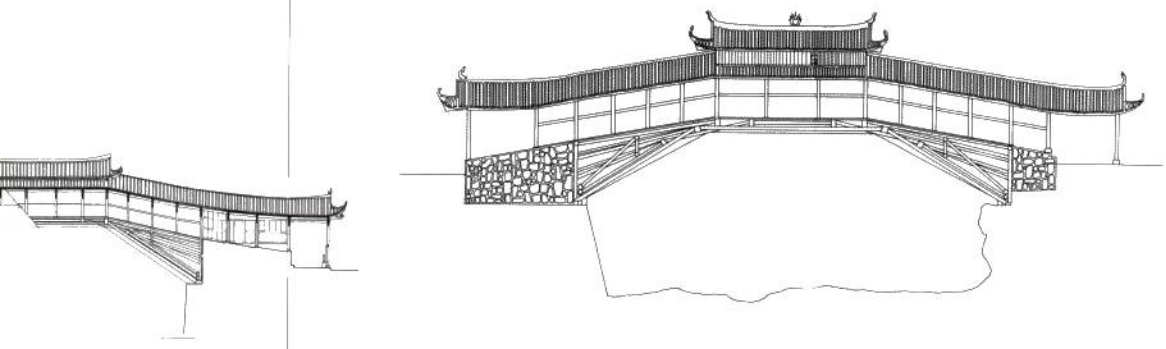
北涧桥
Beijian Bridge



◎ 溪东桥东立面图
East elevation
of Xidong Bridge

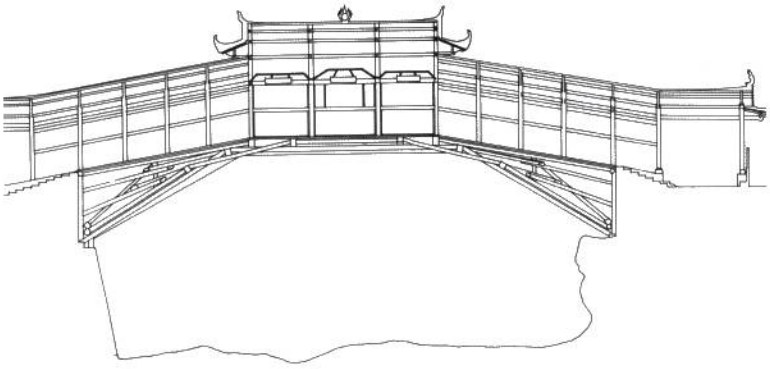


◎ 溪东桥横剖面图
Transverse section
of Xidong Bridge



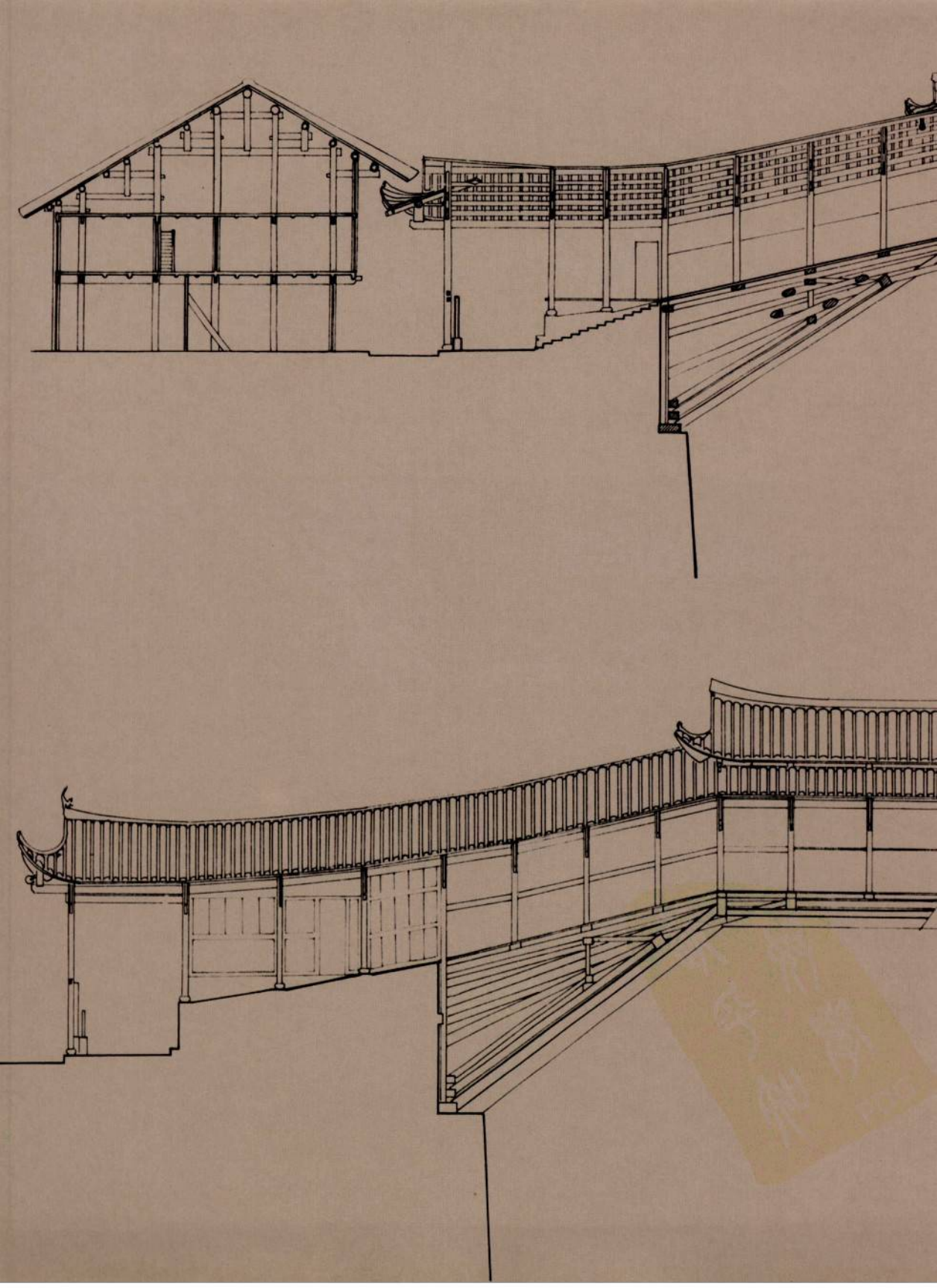
溪东桥北立面图

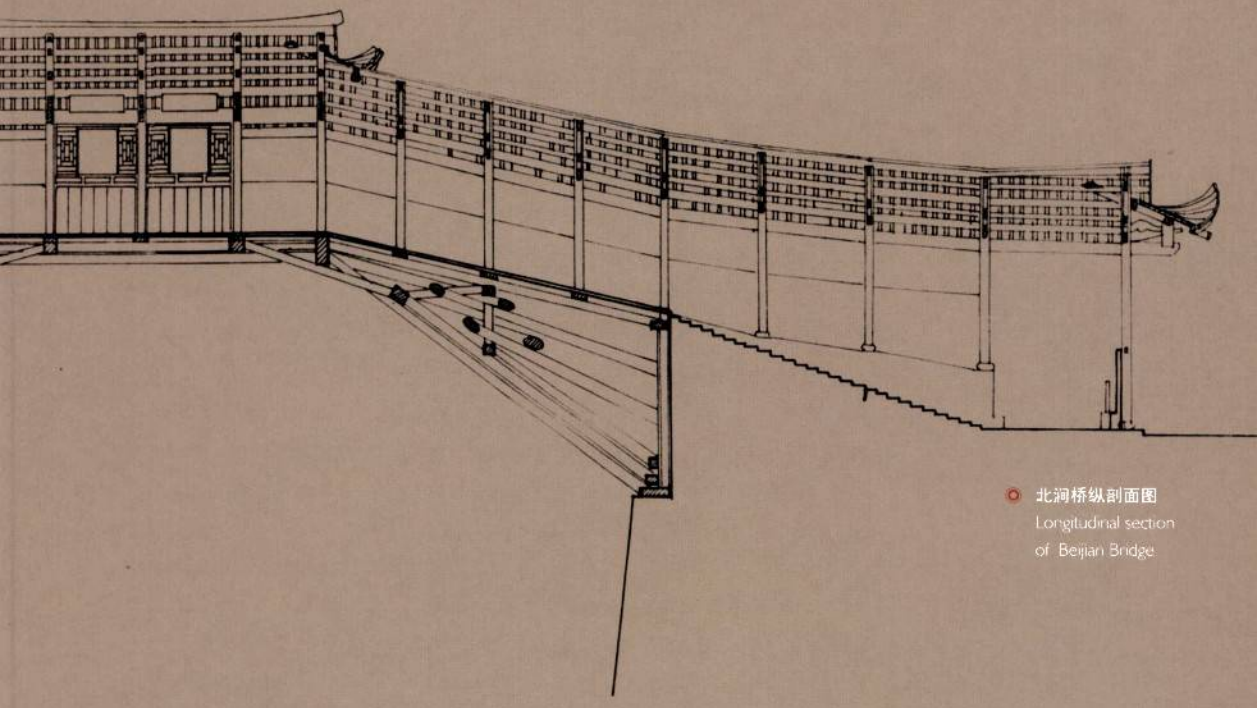
North elevation of Xidong Bridge



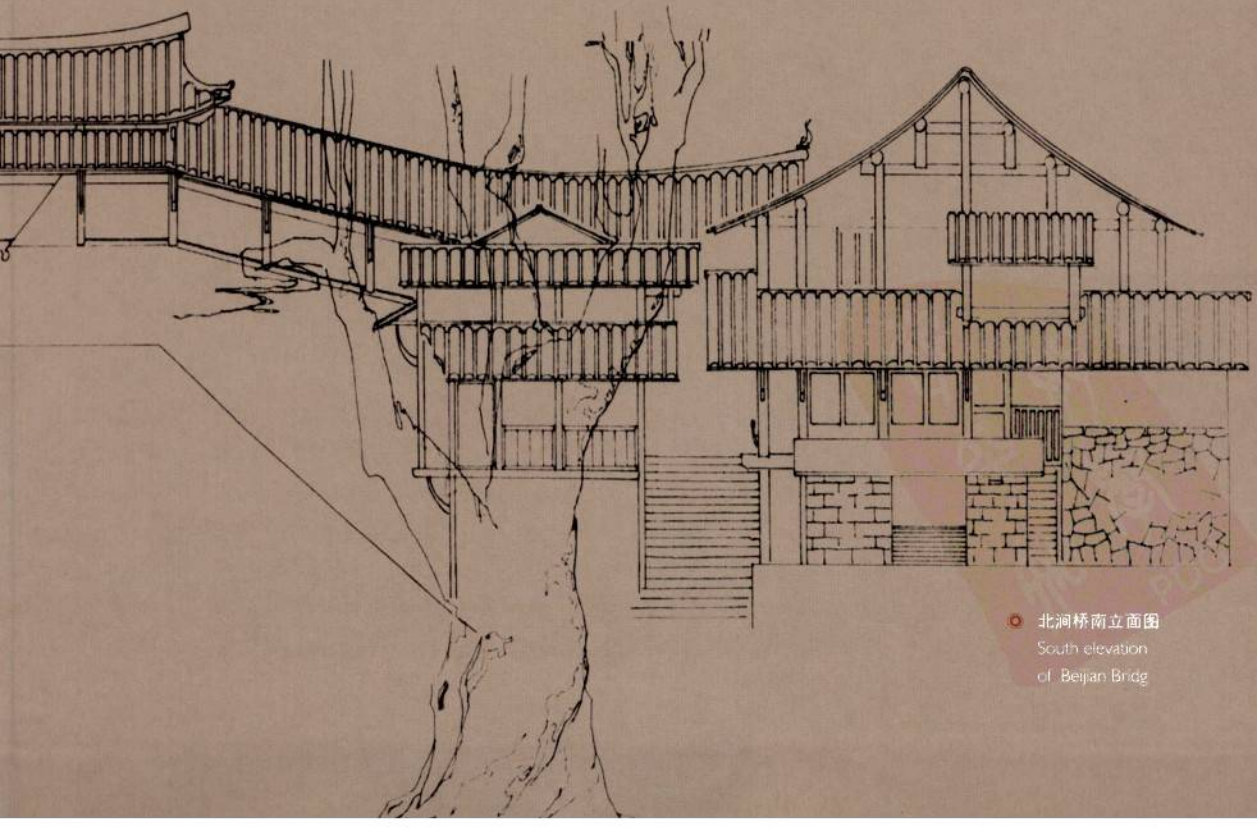
溪东桥纵剖面图
Longitudinal section of Xidong Bridge

北涧桥
Beijian Bridge



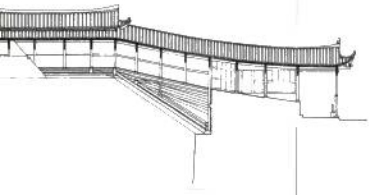


北涧桥纵剖面图
Longitudinal section
of Beijian Bridge



北涧桥南立面图
South elevation
of Beijian Bridge

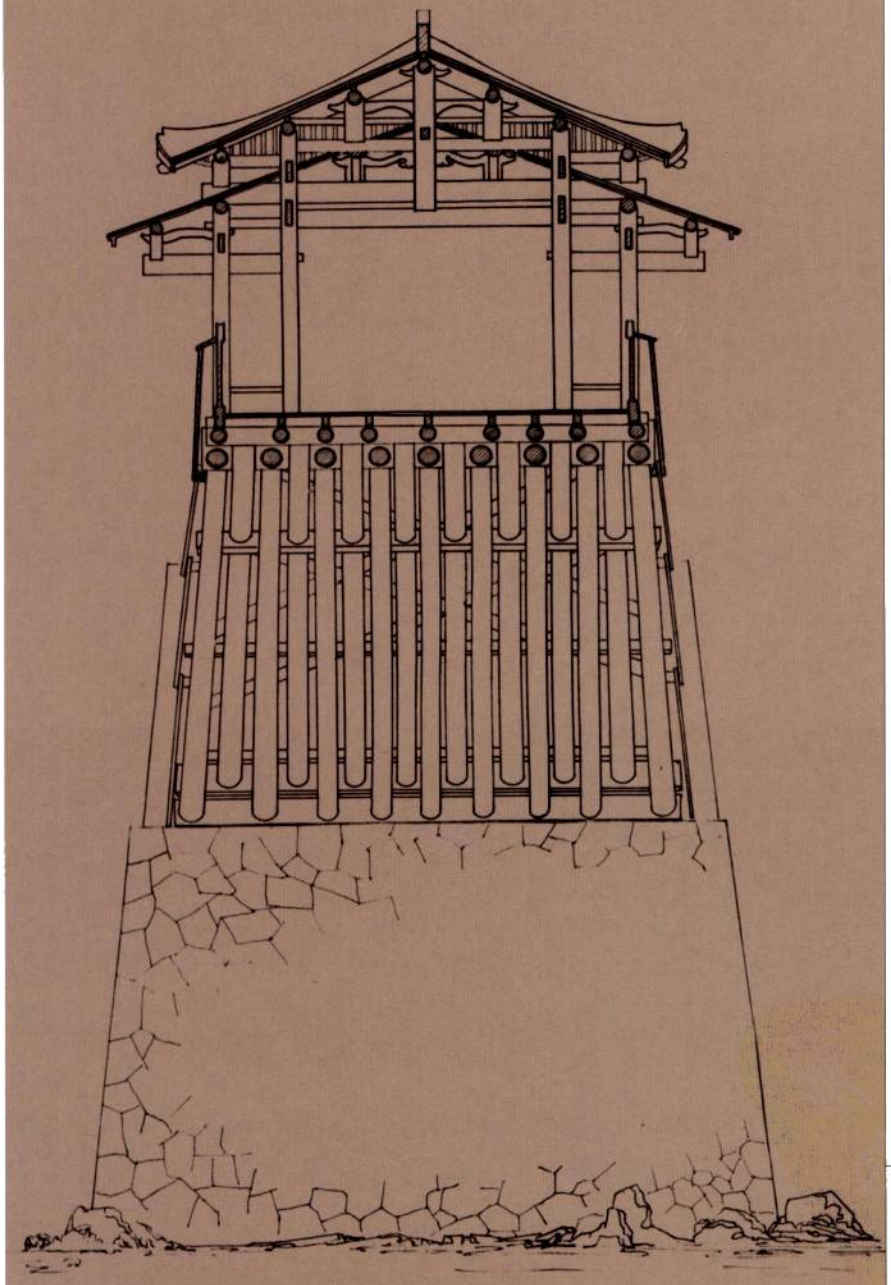
座桥均经数次大的修造，很难判断这对师徒各为哪一次修造的主事。据桥头的碑文及桥上一些题字来看，北涧桥建于清康熙十三年（1674），重修于清道光廿九年（1849）；溪东桥复修于清乾隆十年（1745），重修于清道光廿七年（1847），后又历经多次修缮，现基本保存完好。



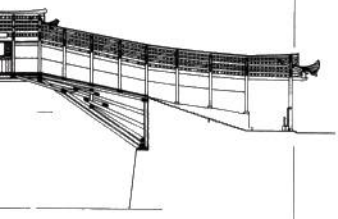
两座桥均有立碑记叙修桥时的捐资情况。当时，北涧桥是当地唯一横跨东溪的桥梁，因此，桥头两岸逐渐形成繁荣一时的村镇，沿桥头还形成一条小小的店铺街，底层是一溜溜的店铺，二层供主人居住。桥与建筑的结合，是北涧桥的最大特点。北涧桥旁的商业街现存店铺是五十多年前重建的。据当地乡民回忆，以前店铺还要多，但因火灾而毁于一旦。北涧桥老街上的店铺有药材店、南货店、布店等，现在我们仍然可以看到的贴在门楣上的“林仁和号”的店名，是为当时的南货店。如今还住在老店铺中的八五老人林英，曾在桥头店铺中开过茶铺。在她之前，是一个下桥村人在茶铺中为路人烧茶济渴；那人过世后，又有南山人来掌管茶铺，这些都是土改以前的事。那时下桥村还有堂众田，路人喝茶都是免费的，在茶铺中烧茶的人就靠堂众田的田租过日子。到林英开茶铺时，已是土改后。村里的堂众田已被分到各户，便由下桥村出资雇她烧茶。“过路人很多，一天要烧好几大锅茶水呢！”说起当时北涧桥头的热闹，林英好像又回到了从前的时光。北涧桥西边半倾的木楼里，81岁的老婆婆坐在窗前，阿婆叫翁春娥，娘家是筱村地主，18岁嫁入泗溪汤家。泗溪是泰顺重镇，历来经济发达。公公汤一清头脑活络，看中了北涧桥边的旺铺，一口气买下3间。泰顺的廊桥，如建在荒僻山野，是来往路人歇脚、避雨之所；如建在村中、镇上，往往成为该地交流与交易的中心，紧挨廊桥而盖的木楼房，便是当时当地的黄金店铺了。每天天刚发亮，汤家的大门板一字儿铺开，开始了一天的买卖。有红糖啊、生姜啊，等等，基本是南北干货。当时还是小媳妇的翁春娥当柜而坐，花朵般地惹人眼热。“生意好兮好啊，”至今回忆起来，阿婆仍是一脸的甜蜜，“来来往往的人都打这儿过，桥两边开满了店。”过大年时，镇上请来木偶戏班，便在廊桥上开唱。阿婆独上高楼，躲在三层的小阁楼里，撩开窗边老树的烦人枝叶，桥上、台上便一览无遗了[3]。

◎ 南溪桥（内景）
Nanxi Bridge (interior view)

北涧桥及其周围环境幽美。两条溪水在桥边汇合到一起，溪水清澈见底，溪水上还有一条用石梁搭起的小石桥，接以矶步。每当溪水上涨之时，整座小石桥就会淹没于水下。沿着溪岸，一条小路将行人引向桥头和村子。两株大樟树立于桥头（也是村头）。较粗的一株直径有两米多。粗略估计，这两株树至少有600年以上树龄了。两株大树起到了加固水土的作用，其虬根牢牢抓住桥基周围的土石，保其经受了数百年风雨的侵蚀而无大碍。由远处沿小路向北涧桥走来，两株大树茂密的树冠就像老翁的须发轻轻抚掩着古桥及周围古朴的民居，若隐若现。桥头的一条石板小街是整个村子的中心。



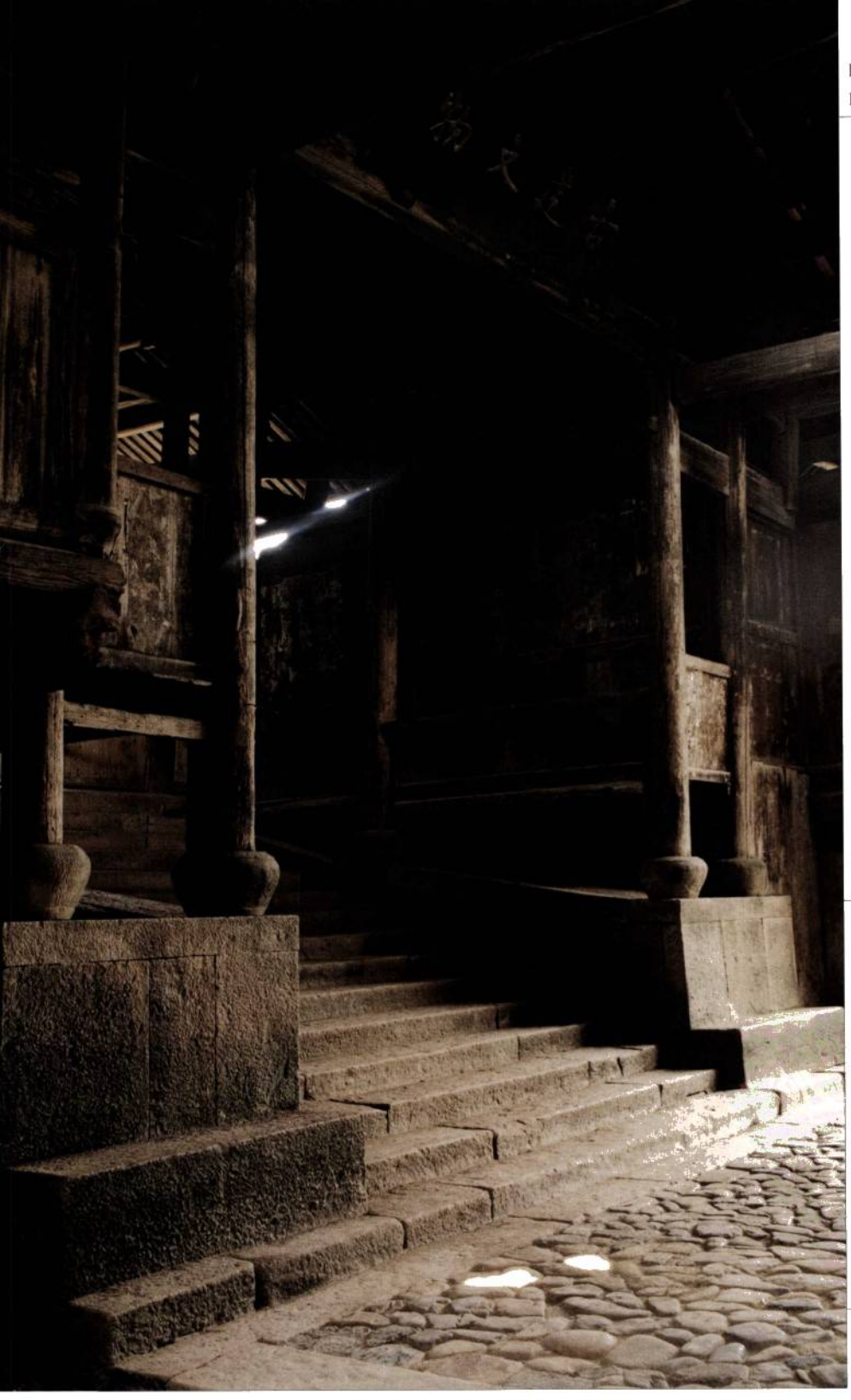
北涧桥横剖面图
Transverse section
of Beijian Bridge



一边是廊桥，一边是民居。廊桥山花的飞檐与民居的屋檐互相交错在小街之上，可以让人躲蔽日晒雨淋。桥头及屋檐下很适宜地设置了一些石凳木椅，让人们可以随意找到休息的地方。村民无事时便在桥头休憩，谈天说地，甚至买卖交易。真是功能与人情味完美地结合到建筑空间中。这正是现代建筑所欠缺的，这里也许能给现在的建筑师们一些启示。

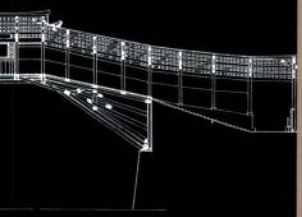
北涧桥在修建之时，就可能考虑到了与邻近建筑的结合。这一点可以从桥与建筑的连接看出来：桥柱上预留了榫头与建筑相连。桥的造型如民风一般古朴，沿着结构的走势呈三折的拱形。桥面上四列方柱，上覆屋檐。两端得山花为歇山式。桥的中间起重屋，也是歇山顶。斜脊起翘很高，因此显得十分轻盈。《诗经》中的“如跂斯翼，如翚斯飞”用在这里是再恰当不过了。结构部分用油红漆木质挡雨板封住，以免风雨侵蚀。整个桥体结构合理，比例匀称，灰瓦红身，与青山碧水相掩映，是一幅美妙绝伦的风景画。

从泗溪镇南溪村的村头进去，穿过一段卵石路后，就到了南溪桥边，桥为木构，屋架很古朴，屋檐装饰却做得非常精致。廊桥旁的老街在清末民初时曾是泗溪一带著名的商贸之地，百年过后的今天仍完好保存着许多商业店铺。世居南溪村的有林、包等姓氏，他们从泗溪下桥、白粉墙等地迁居

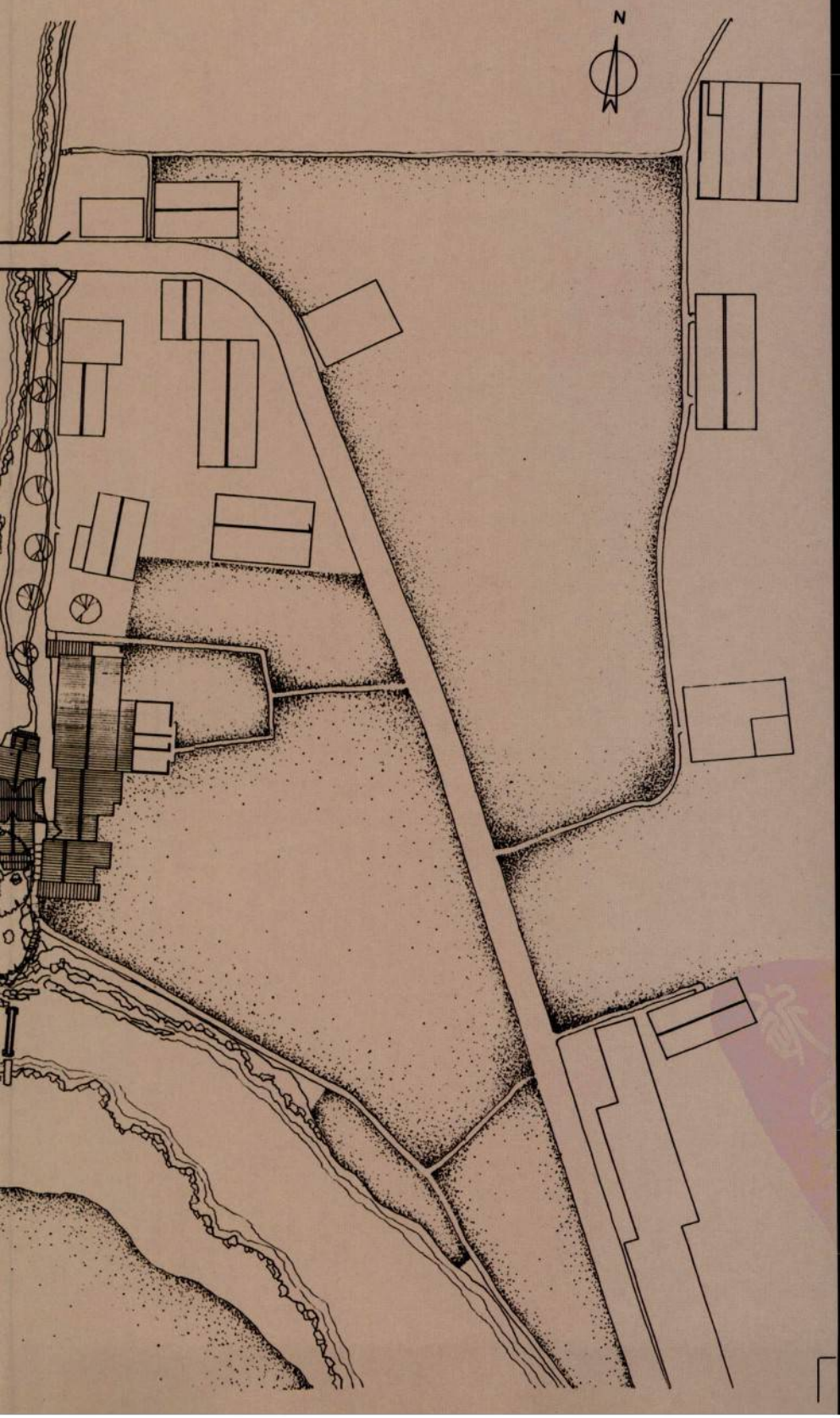


泗溪北涧桥不论从桥梁结构，还是桥与建筑的结合，人文景观与自然景观的结合，都是一个典范，充分体现了中国传统建筑空间与环境的关系。

Either in its structure, or in the connection of the bridge with other constructions, or in the harmony of the artificial scenes with the natural scenes, Beijian Bridge in Sixi Town is a model bridge, which represents the spatial and environmental relations in the Chinese architectural tradition.



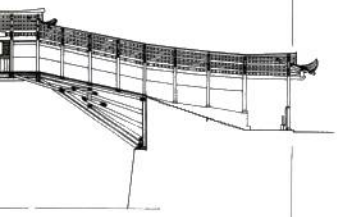
廊屋内的神龕
Shrine in the lounge house



北涧桥总平面图
Site plan of Beijian Bridge

南溪。最早落脚南溪的是林氏，为泗溪林建的后裔。包氏在公元1643年迁居南溪，后世的族人称这位始迁祖为“辟南公”，有“开辟南溪”之意。以南溪桥为中心，南溪村的商业街被划分成两半，当地人分别称为上街和下街。南溪桥边原来有一座戏台，还有一个叫“官基埕”的地方，相传泰顺未立县时，境内屡遭倭寇侵扰，百姓无法安居乐业。泰顺建县后，福建福鼎和泰顺两地的政府官员曾在这里商讨御寇，便有了“官基埕”的地名。南溪村的商业街在泗溪一带非常有名，泗溪镇的白粉墙老街和下桥村的集市都晚于南溪村商业街。而当白粉墙村商业街后来居上，成为泗溪一带重要的商业中心时，南溪老街就开始衰败了[4]。

柳峰墩头桥所在地是一个多姓杂居的村落，在廊桥的周围至今还存留着大量商业建筑，透过这些鳞次栉比的店铺，我们还可以遥想到当年人气的兴旺，商业的繁华。在最兴盛的年头，墩头桥廊屋内也摆起了小摊。以廊桥为中心建造的这些商业店铺中的商品，有来自福建桐山的，也有本县的特产。当年人气聚集的墩头桥老街现在已冷清了下来，但我们通过字号牌匾、店堂标牌等仍能感受到当年浓厚的商业气息，坐商和行商文化已渗进这儿的一砖一瓦，一土一木。普宾桥与墩头桥一样，同处在“桐山大道”上，据说，普宾桥因地处交通要道，在建造时曾得到泰顺、寿宁、桐山、平阳、柘荣等五个县群众的捐助。桥梁竣工后，还有一部分捐助款未用完，于是又在桥头建了一座五榴的茶亭，雇人烧茶免费给路人饮用。后来新建了公路，走古道的人就少了，茶亭施茶的人也走了。不过，在桥上的廊屋里到开起了一爿店，为当地的村民供应日用品。泰顺的一些廊桥，不仅是当地乡民买卖交易的场所，在桥头还建供路人休憩、住宿的旅社。如薛宅桥旁的商业街当地乡民称为“营岗店”，山里山外的客商将各类商品聚集于此，这条老街也成为三魁附近一带乡民贸易的重要场所。可惜如今，“营岗店”已完全被改造，成为一条现代化的商业街道，薛宅桥也被这些新式民居包围在其中，原本巍峨宏伟的木拱桥现在已经淹没在钢筋混凝土的楼群中，不复往日的风采[5]。



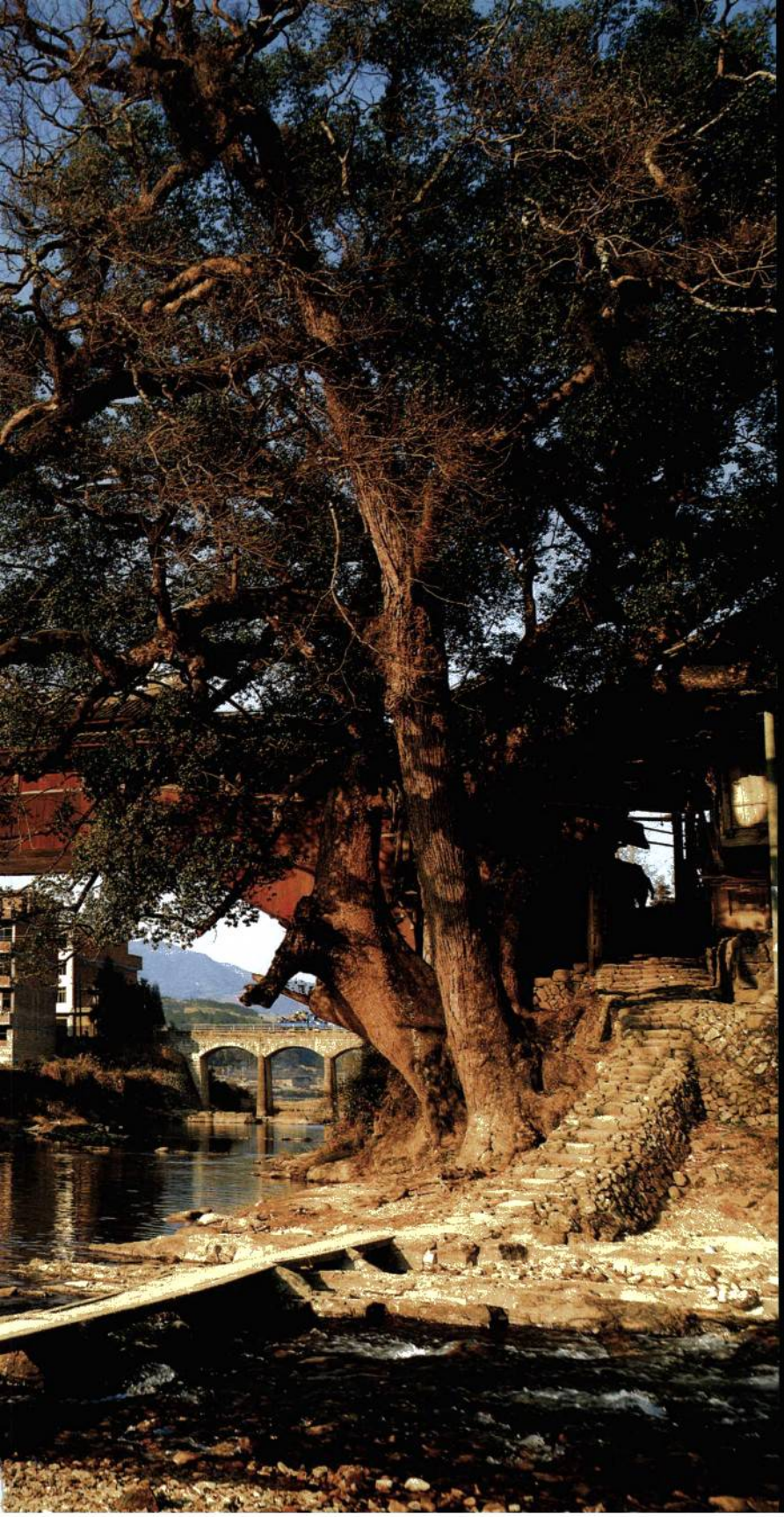
◎ 泰顺地区的祠堂内景
Interior view of an ancestral hall in Taishun area

over 2 meters. A rough calculation shows that these trees are at least over 600 years of age. One of their functions is to prevent the soil from eroding away, for their roots grasp the soil near the bridge piers, which have successfully helped the bridge sustain natural calamities for hundreds of years. Walking near to Beijian Bridge along the path, you will see the crowns of the two trees swaying gently over the ancient bridge and its nearby residents with the green leaves and branches, just like an old men does with his long beards. The narrow street paved with flagstones runs from the end of the bridge along the central line of the village, the lounge bridge on the one side, and the residential houses on the other. The protruding eaves of the lounge bridges and those of the residential houses extending over the narrow street provide a shelter for the people hiding from the sun or the rain. A number of benches and stools are properly arranged under the eaves for these people to rest at any time. The villagers may rest or chat, or even trade by the end of the bridge. It is a perfect combination of practical use and human appeal, which many of the modern buildings lack. Modern architects may be able to find something useful in it.

The architect of Beijian Bridge may have considered its harmony with the surrounding construction when it was first built. This may be found in the way the bridge connects with these constructions - on the bridge pillars are reserved some joggle joints for connection with the constructions. The model of the bridge is as simple as the local lifestyle, which takes the shape of a triangle. Four rows of pillars are arranged on the bridge surface, by which the lounge houses are supported. On either side of the lounge house is a gable and hip roof, and there is a double house with a gable and hip roof in the middle of the bridge. The tilted roof ridge is protruding high with a certain sense of animation.

北涧桥屋面（局部）
Roof of Beijian Bridge (part)

【注释】
①参照黄红军著《车马·溜索·滑竿——中国传统交通运输习俗》一书，第四页。
②④⑤参照薛一泉先生在《廊桥》网站上“泰顺廊桥”一文。
③参见张琴著《乡土温州》，浙江古籍出版社，2003年4月版。



北涧桥
Beijian Bridge

后记

2001年3月，我第一本关于泰顺的书——《乡土中国·泰顺》经北京三联书店出版以后，相继发行了23000多册，海内外对中国乡土文化关注的朋友很多也因此知道了泰顺，尤其是了解到泰顺有许多优美、耐用的木廊桥。2003年，我进一步介绍泰顺乡土文化的《库村》一书由河北教育出版社和台湾艺术家出版社在海峡两岸几乎同时出版，发行量估计也已突破了万册。《库村》书中虽然主要讲的是泰顺库村的事，但却对毗邻的庆元县的木拱廊桥——如龙桥做了一些介绍。而此次应上海人民美术出版社之约，由我和沈为平教授合著的《泰顺廊桥》，则是一本全方位系统论述泰顺廊桥的专著，也是一本以图为主、图文并茂，学术性和观赏性兼具的大型画册，它的出版，必将为世界了解泰顺廊桥又打开一扇窗户。

“景（宁）泰（顺）寿（宁）庆（元）”四县虽然分属浙、闽两省三地（浙江丽水市、温州市和福建宁德市），但从大的历史背景来看文化却属同源。此地区遗存的上启宋明、下至建国后营造的上千座木廊桥也是四县共同拥有的一大文化遗产。在这共同的文化圈里，福建寿宁的建桥匠师对木拱廊桥的营造最为擅长，在浙西南、闽东北这一广阔的区域里，他们上山下乡，四处营建，造就了百余座的木拱廊桥。同时，这一地区的桥梁营造又是在互相协作、取长补短和互通有无的不断交流中进一步发展、兴盛起来的。比方说，寿宁县下党乡的鸾凤桥1963年重修时的一块题刻上记载：“寿宁县西门坑底东山楼村木匠郑惠福，浙江庆元坝头村石匠吴详东”；泰顺县三魁镇上的薛宅桥也有类似的题刻：“寿邑小东绳墨徐元良，副墨徐斌桂、陈泽应、郑福寿、郑起鉴、薛思年”，其中徐元良、徐斌桂、郑福寿、郑起鉴等人来自福建寿宁，而薛思年就是泰顺当地的薛氏族人。另外，泰顺尚存的造桥匠师——董直机老师傅也是从寿宁县学成的木拱廊桥营造技术。浙江籍的工匠对砖石技术似乎更加在行，许许多多的乡土建筑以及木石结构的桥梁也都有他们杰出的贡献。在这样一个技术交流广泛而长期存在的地区，泰顺由于其特殊的地理位置而成为了该区域文化的中心。从这个角度上讲，今天你去看泰顺廊桥，你已经不是在审视一座具体的位于浙江省泰顺县的某一座桥了，你面对的却是浙闽交界山区共同技术和文化作用下的一座廊桥。当然，由于山势险阻，该地区的文化和技术交流当然比不上平原地区那样来得直接、迅速和充分。但是，正因为这些存在着的交流障碍，却导致了泰顺、乃至浙闽

泰顺的廊桥，由于其历史之悠久，技艺之精湛，使它在中国桥梁史上占据着重要地位……

Postscript

Jingning, Taishun, Shouning and Qingyuan – these four Counties belong to two Provinces of Zhejiang and Fujian, and three cities of Lishui and Wenzhou of Zhejiang Province, and Ningde of Fujian Province. However, they share the same cultural origin from the historical background, where the bridge builders from Shouning of Fujian Province were the best in constructing the timber arch lounge bridges. They have built hundreds of timber arch lounge bridges in a broad area including the southwest of Zhejiang Province and the northeast of Fujian Province. These bridges in those places have witnessed a continuous improvement and prosperity in communication of the art of bridge building when the builders assisted each other and learned from each other. One of the evidences were the carvings on the stele erected when Luanfeng Bridge was rebuilt in Xiadang Township of Shouning County in 1963, on which appear the builders' names as "Zheng Huifu, a carpenter from Shouning and Wu Xiangdong, a stonemason from Zhejiang"; similar carvings appear on Xuezhai Bridge of Sankui Town of Taishun, which show the "master line marker as Xu Yuanliang, and assistant line markers as Xu Bingui, Chen Zeying, Zheng Fushou, Zheng Qijian and Xue Sinian", where all the line markers came from Shouning of Fujian Province except Xue Sinian who came from the Xue's family of Taishun. Dong Zhiji, the bridge building master now still living in Taishun, learned the technology of building timber arch lounge bridges from Shouning County of Fujian Province. Stonemasons from Zhejiang Province tend to be better at brick and stone technology and a lot of rural constructions and timber-stone structured bridges are their contributions. Taishun, due to its special geographical location, became the cultural center of the area of wide-ranging technology communications over the years. In this way, when you see a lounge bridge in Taishun, you are not looking at a specific bridge in Taishun of Zhejiang Province, but a bridge constructed under the co-influence of technology and culture in the Zhejiang-Fujian mountainous area. Though the communication in culture and technology, prevented by the mountains, may not be as direct, swift and sufficient as it may be on the flatland, the difficulties in communication helped, however, to differentiate the bridge cultures within Taishun as well as those of the Zhejiang-Fujian mountainous area, while retaining certain similarities, which in fact constitute the multiplicity of the bridge cultures within Taishun, as well as those of the Zhejian-Fujian mountainous area for which they represent, and to explain the direct reasons for their varied styles.

In the 1950s, bridge historians noticed the special timber arch structure of Bianhe River Rainbow Bridge in the famous painting of "*Festival of Pure Brightness*

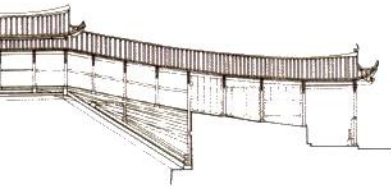
山区的桥梁文化在大同的基础上也存在着小异，这些小异就构成了今天泰顺以及它代表着的浙闽山区桥梁文化的绚丽多姿，是直接造成其风格多样化的根本原因。

20世纪50年代，桥梁史界发现了北宋名画《清明上河图》中汴水虹桥的特殊木拱结构，以唐寰澄先生为代表的老一辈古桥专家对其进行了深入的文献和模型结构的考证与研究；自从20世纪70年代又在以泰顺为中心的浙闽交界山区发现了结构与汴水虹桥极其类似的木拱廊桥以来，科学史界就没有停止过对它们的身世以及渊源展开的研究、讨论甚至争论。争论的焦点主要集中在汴水虹桥和浙闽虹桥两种技术到底孰先孰后，抑或是各自独立发展起来？这两种桥式如果从结构上看到底孰优孰劣，其结构命名又当如何？这些问题历经半个多世纪的研究和讨论，却并没有得到很好解决。另外，以泰顺为中心的浙闽山区到底蕴藏着多少座这样的木拱廊桥，各自具体的情况又是怎样？目前，研究界也拿不出准确的数字及详细的资料。

2001年的岁末，当时身为上海交通大学副校长的沈为平教授看了我的《泰顺》一书后，他非常热心地打电话给我，关心、鼓励和支持我们的考察研究工作。我当时非常感动。毋庸讳言，在交通大学这类以工科为主的学校对人文科学以及相对偏软的学科的发展历来并不重视，类似情况在国内其他大学亦然。在这种大环境之下我们能得到一定的支持实属不易，当时我们也觉得万分幸运并倍感珍惜。在院系其他领导以及沈教授的积极支持和推动下，我们研究小组每年都会深入到浙闽山区木拱廊桥之乡进行一次或数次的实地考察，并开展相应的研究工作。到目前为止，我们研究组在浙闽两省各地文博专家的协助下基本弄清楚了这一地区的木拱桥的数量和分布情况。并对浙江省之庆元、景宁和泰顺县以及福建省寿宁县等地的大部分木拱桥做了较为详细的考察。

自2002年起，沈教授不惟支持我们研究，还亲自加入到我们的研究工作中来。他是中国结构和力学方面的专家，由于有了他的参与，我们研究的视界和考察的范围都迅速扩大。以前我们所用的主要是建筑学的一些考察手段和建筑史学的研究方法，比如运用建筑测绘、文献调查等方法；沈教授的加入，给我们带来了崭新的思维方法，使得我们的研究在某些领域很快就得到了突破，比如他首次提出运用工程技术进化论的观点来论证汴水虹桥和浙闽木拱桥的渊源关系。2003年，我和沈教授曾两次去到泰顺作廊桥考察。同年，我在沈教授鼓励支持下申报的国家自然科学基金项目《中国古代南方木构建筑起源与流变研究》，也得到了基金委员会的批准，其中浙闽木拱廊桥的研究也是涉及南方木构建筑发展的一个重要内容。

2004年6月中旬，沈教授和我带着题目为“CHINESE RAINBOW BRIDGES”的论

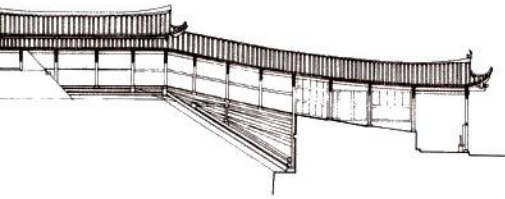


on the River" produced in the Song Dynasty, and senior experts in ancient bridges represented by Mr. Tang Huancheng made a profound study and textual research of its documentation and mode structure; since the timber arch lounge bridges in the Zhejiang-Fujian mountainous area centered by Taishun were discovered in the 1970s to have striking similarities in structure to the Bianhe Rainbow Bridge, science historians have never ceased to study, discuss and even dispute on their history and origins. The center of the dispute is whichever the earlier between the technology of Bianhe Rainbow Bridge and that of the rainbow bridge in Zhejiang-Fujian Provinces, or whether they had developed independently, whichever is better in terms of structure of the two types of bridges and how to give a proper name to these structures. These problems have not been solved thoroughly over the past half of century through discussion and dispute. Besides, the academic field is still unable to give a detailed account as to how many timber arch lounge bridges of the type there are in the Zhejiang-Fujian mountainous area centering Taishun and in what conditions they exist.

Professor Shen Weiping, then Vice President of Shanghai Jiaotong University, rang me with high enthusiasm after he had read my book *Taishun*, and expressed his encouragement and support to our inspection tour and research work.

Professor Shen has not only given support to our research work, but also joined our work since 2002. We made rapid progress in widening our views and scope in the research work with his participation, as he is a famous expert in China in structure and mechanics. Before his participation, we had mainly used the research methods of architectural inspection and architectural history, such architectural survey, documentation investigation etc., whereas after his participation, new ways of thinking were brought in and we achieved several breakthroughs in certain fields, e.g., Professor Shen proposed for the first time to expound the connections between Bianhe Rainbow Bridge and the Timber Arch Bridge in Zhejiang-Fujian region by the theory of engineering technology evolution. Professor Shen and I went to see Taishun bridges for twice in 2003. In the same year, the project sponsored by Natural Science Foundation of China with the title of "*A Study of the Origins and Changes of the Timber Constructions in Southern Ancient China*" which I had applied for earlier was approved by the Fund Committee under the support and encouragement of Professor Shen, in which the study of timber arch lounge bridge in Zhejiang-Fujian region forms an important part to the research of the development of timber constructions in Southern China.

Professor Shen and I went to Europe in mid-June 2004, and We presented a dissertation with the title of "Chinese Rainbow Bridges" at the 8th World Conference on Timber Engineering and gave a lecture in Sibelius Hall in Finland, as the only representative from Asia, which attracted wide attention from the audience from all over the world. We jointly visited Yuqing Bridge in Wuyishan City in Fujian Province on 17 August 2004, and drove for over 200



文远赴欧洲参加第八届世界木工程大会，并作为亚洲地区的唯一代表在主演讲大厅——芬兰西贝柳斯音乐厅做了演讲，引起世界各国与会代表的广泛关注。8月17日，我们一起又到福建省的武夷山市考察余庆桥。21日我们驱车二百多公里，途经政和县去到了浙江省庆元县，我们在那里借县里搞香菇旅游节之机组织召开了第一届浙闽木拱廊桥学术研讨会，这次会议可以说是浙闽木拱廊桥研究的一个里程碑。会议上，代表们一致决定成立中国虹桥研究会，并成立了临时筹委会，大会推举沈教授为筹委会主任，南京大学建筑研究所赵辰教授和我为副主任，还决定以后每年都召开一次学术会议，原则上在浙闽两省轮流召开，泰顺县代表、县委宣传部部长何平先生转告县委意见，表示非常愿意承办下一届研讨会。

种种情况表明，中国虹桥的研究正在从以前的地方性、少数人研究的际遇逐步走向正规化、规模化、组织化和国际化，这个课题也必将从一个生僻的学术园地走向未来建筑史学和桥梁史学研究的热点。我们不能不为之振奋！

促成这本画册能早日出版的还有两位关键人物，那就是泰顺县委书记周维亮和宣传部长何平两位先生。他们高瞻远瞩的视野和果敢的气魄使得这本画册的出版没有遭到一刻的耽误。他们对泰顺的文化遗产的珍惜和爱护之情，对弘扬民族文化的拳拳赤子之心，以及雷厉风行的工作作风都让我们敬佩不已！

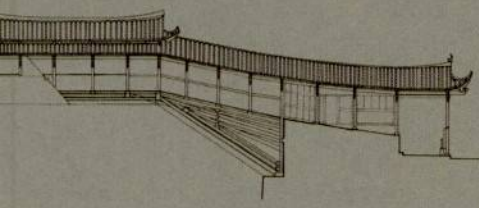
一部书的写成实际上是集体协作的共同成果，《泰顺廊桥》的出版也是如此。我们需要感谢的人实在太多太多。这本书引用了不少地方上的研究人员的调查成果，其中有泰顺县文博馆的薛一泉先生和寿宁县文化馆的龚迪发先生的研究成果，也有上海同济大学、交通大学建筑系学生的劳动成果，在这里无法一一列举。作为一本大型画册，书中的摄影作品无疑是至关重要的，摄影家周咸俊、李永在、季海波、张俊、施明达、林作贤、林上兆、江小铎、孙斌、陈圣格、荣家琪、夏勤治等先生为本画册提供了众多优秀的摄影作品，使本画册增色不少。我们对他们的辛勤工作表示诚挚的谢意！同济大学建筑系教授路秉杰先生引我入泰顺，让我有机会接触和研究泰顺廊桥，是值得我永远铭记和言谢的！清华大学建筑系教授陈志华先生长期以来指导和支持我对浙闽地区乡土建筑的研究，让我受益匪浅，也是自当感谢的！中国建筑史学分会理事长、我的博士研究生导师之一——杨鸿勋先生长期以来一直指导着我们的虹桥研究，引领我们窥其堂奥，当他听说我们的研究成果即将成书出版时，也很高兴，并在百忙中为之作序，他对年轻学人的关切与无私帮助让我不胜感激！国家自然科学基金委对我们课题的立项支持是非常关键的，它的精神鼓励以及资金支持让我们感到荣耀的同时而又倍感责任重大。此时此刻，我们谨以大型画册《泰顺廊桥》的出版来表达对他们工作的敬意和感谢！

kilometers on 21 August to Qingyuan County in Zhejiang Province via Zhenghe County, where we joined an academic seminar on timber arch lounge bridges in Zhejiang-Fujian region during the local "Xianggu Mushroom Touring Festival". That seminar was a landmark for the study of timber arch lounge bridges in Zhejiang-Fujian region. The representatives made a uniform decision to establish the China Rainbow Bridge Academy on the seminar and set up the Interim Preparatory Commission, where Professor Shen was elected Director of the Commission and Professor Zhao Chen from the Architecture Research Institute of Nanjing University and I were elected Deputy Director thereof; it was further decided that such academic meetings shall be held once a year in either Zhejiang or Fujian by turns as a principle. Mr. He Ping, the representative from Taishun and Head of Publicity Department of Chinese Communist Party Commiffee of the County, expressed the opinion from the County's CPC Committee that they were willing to organize the next seminar.

Things have proved that the study of rainbow bridges in China has developed from a local and minor activity in the past to a more formal, organized and international stage at the present time, and this subject will progress from the lonely academic field to a hot topic in the historic studies of architecture and bridge. We cannot help feeling excited!

Two of the key persons to make this book published so early are Mr. Zhou Weiliang, Party Secretary of Taishun County, and Mr. He Ping, Head of Publicity Department of Chinese Communist Party Commiffee of Taishun County. Their far-sightedness and resolution have made this book published without having even a little hindrance. Their love for the cultural relics of Taishun and their sincere wish for extending the national culture as well as their vigorous style of work have impressed us deeply.

The completion of any book is the common fruit of collective cooperation, so is the publication of this book of *Lounge Bridges in Taishun.* There are too many people we feel indebted to. This book has used the inspection results from quite many local researchers, including those of Mr. Xue Yiquan from Taishun Museum and Mr. Gong Difa from Shouning Cultural Center, and the results achieved by the students from the Architecture Departments of Shanghai Tongji University and Jiaotong University, of which it is hard to give a list; pictures are nevertheless critical to such a comprehensive picture album as this, and these wonderful pictures in fact come from the photographers Zhou Xianjun, Li Yongzai, Ji Haibo, Zhang Jun, Shi Mingda, Lin Zuoxian, Lin Shangzhao, Jiang Xiaoduo, Sun Bin, Chen Shengye, Rong Jiaqi, Xia Qinzhi, etc., who have made this book much more entertaining. We hereby extend our heartfelt thanks to them for their hard work! Mr. Lu Bingjie, Professor of the Architecture Department of Tongji University, first invited me to Taishun, which made it possible for me to access and study Taishun lounge bridges, and for his kindness I will always remember! Mr. Chen Zhihua, Professor of the Architecture Department of Qinghua University, has long given me support and



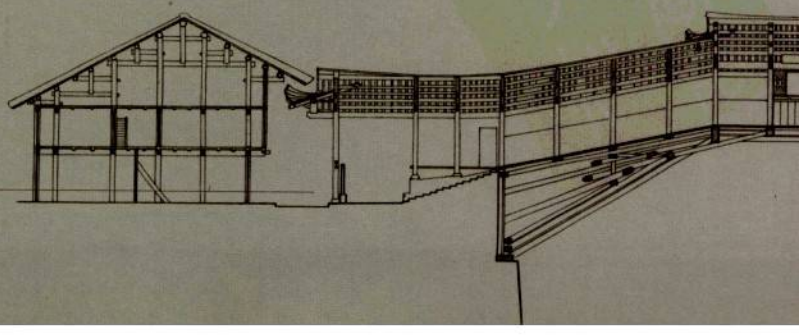
instructions during my study of local Vernacular Architecture in Zhejiang-Fujian region, to whom I always feel indebted! Mr. Yang Hongxun, Chairman of China Architectural History Association and one of my Doctorial Advisors, has always given me support by giving instructions during our study of rainbow bridges, who also writes the Preface for this book with happiness on hearing the publication of this book as one of our academic results, and for his care and unselfish help to young scholars I feel very thankful! The support from the National Science Foundalion of China (NSFC) for the filing of this project is very important, whose spiritual encouragement and monetary support make us feel both proud and obliged for the duty. Altogether, we wish to extend our gratitude and respect, with this comprehensive picture album of *Lounge Bridges in Taishun*, for their hard work!

刘　杰

2004年9月19日于上海闵行兰桂园

Liu Jie

Langui Garden, Minhang, Shanghai, 19 September 2004



附录一　书中桥梁索引

Appendix I – Index of Bridges

一．堤梁式桥　矴步

Block Bridge – Dingbu Bridge

仕水矴步：54 页，55 页，56 页，57 页，58 页，59 页，60 页

修建时间：清嘉庆年间（1796 － 1820）

建造地点：泰顺洲仕阳镇溪东村

结构特征：矴步全长 133 米，共 233 齿，齿长 1．78 米，宽 0．24 米，高出水面 0．7 米，齿距 0．6 米

Shishui Block Bridge: P54, P55, 56, P57, P58, P59, P60

Shishui Block Bridge in Xidong Village of Shiyang Town, built between 1796 and 1820, is 133 meters long with 223 steps each 1.78 meters long and 0.24 meters wide, 0.7 meters above shore and 0.6 meters between two steps.

二．木平（简支）梁廊桥

Timber Beam Lounge Bridges (Simply Supported Beam Bridge)

1．包坑桥：24 页，25 页

修建时间：民国十五年（1926）

建造地点：泰顺新浦乡桥头溪村

结构跨度：7．9 米

廊屋规模：廊屋 7 间，桥长 12．7 米，宽 3．4 米，桥屋高 3．9 米，桥面离正常水面 4．3 米

Baokeng Bridge: P24, P25

Baokeng Bridge in Qiaotouxi Village of Xinpu Township, built in 1926, is a timber beam lounge bridge with 7 lounge houses, 12.7 meters long, 3.4 meters wide and 3.9 meters high for the house, standing 4.3 meters above the normal water level with a span of 7.9 meters.

2．北洋桥：24 页，25 页
修建时间：不详
建造地点：泰顺翁山乡和平村
结构跨度：10.33 米
廊屋规模：廊屋 7 间，桥长 12.73 米，宽 3.38 米，桥屋高 3.5 米，桥面离水面 4.05 米
Beiyang Bridge: P24, P25

Beiyang Bridge in Heping Village of Wengshan Township, built in a year unknown, is a timber beam lounge bridge with 7 lounge houses, 12.73 meters long, 3.38 meters wide and 3.5 meters high for the house, standing 4 meters above the normal water level with a span of 10.33 meters.

3．墩头桥：26 页，27 页，166 页
修建时间：清道光十二年（1832）
建造地点：泰顺柳峰乡墩头溪上
结构跨度：8.7 米
廊屋规模：廊屋 7 间，长 16.4 米，宽 4.5 米，桥面离正常水面 1.6 米
Duntou Bridge: P26, P27, P166

Duntou Bridge, located on Duntou Creek of Liufeng Township and built in 1832 of Qing Dynasty, is a timber beam lounge bridge. It is 16.4 meters long, 4.5 meters wide with a span of 8.7 meters, 1.6 meters above the water level, bearing on its surface 7 lounge houses, with 32 pillars.

4．龙垟桥：28 页，31 页，32 页
修建时间：民国五年（1916）
建造地点：泰顺龟湖镇后章龙垟村
结构跨度：7.1 米
廊屋规模：廊屋 6 间，长 14.1 米，宽 4.2 米，桥屋高 5.4 米
Longyang Bridge: P28, P31, P32

Longyang Bridge, located in Houzhanglongyang Village of Guihu Town and started in 1916, is a timber beam lounge bridge with 6 lounge houses. It is 14.1 meters long and 4.2 meters wide for the house, 5.4 meters high for the house with a span of 7.1 meters.

5．南溪桥：28 页，32 页，33 页，136 页，140 页，141 页，160 页，162 页，166 页

修建时间：清道光二十二年（1842）

建造地点：泰顺泗溪镇南溪

结构跨度：6.8 米

廊屋规模：廊屋 9 间，长 20.35 米，宽 4.87 米，高 4.9 米

Nanxi Bridge: P28, P32, P33, P136, P140, P141, P160, P162, P166

Nanxi Bridge, located in Nanxi of Sixi Town and built in 1842, is a timber beam lounge bridge with 9 lounge houses, 20.35 meters long, 4.87 meters wide and 4.9 meters high with a span of 6.8 meters.

6．镇东桥：78 页，79 页

修建时间：始建于明隆庆四年（1549），后重建

建造地点：泰顺县城东门

结构跨度：6.2 米

廊屋规模：廊屋 5 间，桥长 13 米，宽 4.9 米，高 4.3 米

Zhendong Bridge: P78, P79

Zhendong Bridge, located at the East Gate of the County and formerly a stone bridge, was built in 1549 in the Ming Dynasty but rebuilt as a timber bridge with lounge houses. It is single-eave bridge is 13 meters long, 4.9 meters wide, 4.3 meters high, with a span of 6.2 meters, with 5 lounge houses and 24 pillars.

三．设中柱木平梁廊桥

Timber Beam Lounge Bridges with Two Spans (Simply Supported Beam Bridge)

1．普宾桥：28 页，33 页，37 页，142 页，166 页

修建时间：清嘉庆廿五年（1820）

建造地点：雅阳镇新久村。

结构跨度：两跨8.54米

廊屋规模：桥长13.6米，桥屋宽4.3米，桥屋高3.7米

Pubin Bridge: P28, P33, P37, P142, P166

Pubin Bridge, located in Xinjiu Village of Yayang Town and built in 1820 of Qing Dynasty, is a timber beam lounge bridge, 13.6 meters long, 4.3 meters wide and 3.7 meters high for the house with two spans of 8.54 meters.

2．三柱桥：32页，37页，42页

修建时间：始建年代不详

建造地点：三魁镇下武洋村

结构跨度：两跨10.1米

廊屋规模：廊屋7间，长15.4米，宽4.47米，桥面离正常水面3.2米

Sanzhu Bridge: P32, P37, P42

Sanzhu Bridge, located in XiaWuyang Village of Sankui Town and built in a year unknown, is a timber beam lounge bridge with 7 lounge houses, 15.4 meters in its total length, 4.5 meters wide with two spans of 10.1 meters, and 3.2 meters above the normal water level.

3．刘宅桥（仙洞虹桥）：66页，73页，76页，77页，78页

修建时间：明永乐三年（1405），重建于清康熙五年（1666）

建造地点：三魁镇刘宅村水尾

结构跨度：两跨10.5米

廊屋规模：廊屋6间2层，长18.4米，宽6.25米

Liuzhai Bridge: P66, P73, P76, P77, P78

Liuzhai Bridge, formerly known as Xiandonghong Bridge, first built in 1405 in the Ming Dynasty and rebuilt in 1666 in the Qing Dynasty, located at the end of Liuzhai Village of Sankui Town. It is 18.4 meters long, 6.25 meters wide with two spans of 10.5 meters. It has a special shape with 6 lounge houses and 45 pillars, the houses and the wings on both sides are two-floored.

四．伸臂梁木平廊桥

Piled Cantilever Timber Beam Bridge

1．南阳桥（玉岩桥）：28 页，34 页，35 页，37 页，117 页

修建时间：清同治九年（1870）

建造地点：泰顺泗溪镇岩头村

桥梁规模：桥长 41.7 米，宽 4.6 米，高 5.9 米

Nanyang Bridge: P28, P34, P35, P37, P117

Nanyang Bridge (also known as Yuyan Bridge), located in Yantou Village of Sixi Town and built in 1870 of Qing Dynasty, is a piled cantilever timber beam lounge bridge, with 41.7 meters long, 4.6 meters wide and 5.9 meters high.

2．文重桥：36 页，39 页，48 页，49 页，50 页，51 页

修建时间：清乾隆十年（1745），民国 10 年（1921）重建

建造地点：泰顺筱村镇东垟村水尾

结构跨度：两跨 22.4 米

廊屋规模：廊屋 11 间，46 柱，桥长 26.2 米，宽 4.7 米

Wenchong Bridge: P36, P39, P48, P49, P50, P51

Wenchong Bridge, located at the end of Dongyang Village of Xiaocun Town, first built in 1745 of Qing Dynasty and rebuilt in 1921 after repeated destructions, is an piled cantilever timber beam lounge bridge, double-eaved gable and hip roof, bearing 11 lounge houses and 46 supporting pillars, 26.2 meters in its total length, 4.7 meters wide for the bridge floor, with a net span of 22.4 meters.

3．永庆桥：2 页，3 页，78 页，79 页，80 页，81 页，117 页，121 页，144 页，145 页

修建时间：清嘉庆二年（1797）

建造地点：戴州乡下溪坪

结构跨度：二孔跨径 19.12 米

廊屋规模：廊屋 12 间，桥长 36 米，宽 5 米，桥屋高 5.2 米

Yongqing Bridge: P2, P3, P78, P79, P80, P81, P117, P121, P144, P145

Yongqing Bridge, with 12 lounge houses,located at Xiaxiping of Zhanzhou Township, is 36 meters long, 5 meters wide, 5.2 meters high, with a span of 19.12 meters between the two openings. This bridge was built in 1797 in the Qing Dynasty.

4．登云桥（镇南桥、新桥）：73 页，78 页，121 页，142 页

修建时间：始建于明正德年间（1506—1521），万历年间（1573—1619）重建

建造地点：泰顺县城南门

结构跨度：二孔跨径 24.6 米

廊屋规模：廊屋 15 间，桥长 39.5 米，宽 5.35 米，高 5.52 米

Dengyun Bridge: P73, P78, P121, P142

Dengyun Bridge, formerly known as Zhennan Bridge or informally called the New Bridge, located to the south of the County Gate, is 39.5 meters long, 5.35 meters wide and 5.52 meters high, with a span of 24.6 meters between the two openings. This single-eaved bridge was built between 1506 and 1521 in the Ming Dynasty and rebuilt between 1573 and 1619 in the Ming Dynasty.

五．八字撑木拱廊桥

Timber Arch Lounge Bridge Supported By 2 Pillars Standing Astride

1．城水桥（神水桥）：24 页，25 页，109 页，121 页

修建时间：民国三十一年（1942）

建造地点：泰顺龟湖镇后章岗村

结构跨度：跨径 11.2 米

廊屋规模：廊屋 7 间，桥长 15 米，宽 4.6 米，桥屋高 4.8 米，桥面离正常水面 5 米

Chengshui Bridge: P24, P25, P109, P121

Chengshui Bridge, also known as Shenshui Bridge, located in Zhanggang Village behind Guihu Town, built in 1942, is a timber arch lounge bridge supported by 2 pillars standing astride. It has 7 lounge houses, 15 meters long, 4.6 meters wide and 4.8 meters high for the house with a span of 11.2 meters, and 5 meters between the water level and the bridge surface.

2．池源桥：26 页，27 页

修建时间：清咸丰七年（1857 年）

建造地点：泰顺横坑乡池源村

结构跨度：跨径9．5 米

廊屋规模：廊屋 8 间，桥长 21 米米，宽 4．3 米，桥屋高 4．1 米，桥面离正常水面 4．4 米

Chiyuan Bridge: P26, P27

Chiyuan Bridge, located in Chiyuan Village of Hengkeng Township, was washed away by flood in 1853 and rebuilt in 1857, bearing 8 lounge houses with a double-eaved roof, 21 meters long, 4.3 meters wide, 4.4 meters above the normal water level, 4.1 meters high for the house with a span of 9.5 meters.

3．南庆桥：28 页，31 页

修建时间：清光绪年间（1875 —1908）

建造地点：泰顺下洪乡上洪村

结构跨度：跨径9 米

廊屋规模：廊屋 7 间，桥长 16 米，宽 4．4 米，桥面离正常水面 5 米

Nanqing Bridge: P28, P31

Nanqing Bridge, located in Shanghong Village of Xiahong Township and built between 1875 and 1908, is a timber arch lounge bridge supported by 2 pillars standing astride. It is also known as "Palace Bridge" The bridge has 7 lounge houses, 16 meters in its total length, 4.4 meters wide with a span of 9 meters, 5 meters above the normal water level.

4．霞庄桥：42 页，53 页

修建时间：清咸丰二年（1852）建造，同治七年（1868）重修

建造地点：泰顺横坑乡霞庄村

结构跨度：跨径 11 米

廊屋规模：廊屋 9 间，桥长 23．5 米，宽 4．4 米，桥屋高 4 米，桥面离正常水面 4．5 米

Xiazhuang Bridge: P42, P53

Xiazhuang Bridge (formerly known as Wangxiao Bridge), located in Xiazhuang Village of Hengkeng Township,

built in 1852 and refurbished in 1868 of Qing Dynasty, is a timber arch lounge bridge supported by 2 pillars standing astride. The bridge has 9 lounge houses, double-eaved, 23.5 meters long, 4.4 meters wide for the bridge floor, 4 meters high for the house, 4.5 meters between the bridge floor and the water level, with a span of 11 meters.

六．编木拱梁廊桥

Woven Timber Arch-Beam Bridges

1．红军桥：26 页，29 页，30 页，31 页，58 页，60 页，61 页，132 页，133 页，134 页，135 页

修建时间：1954 年 12 月 6 日

建造地点：离泰顺县城西约 15 里与福建省寿宁县犀溪乡李家山村交界溪上

结构跨度：32．9 米

廊屋规模：廊屋 15 间，桥长 39 米，宽 5 米，桥台宽 6 米

Red Army Bridge: P26, P29, P30, P31, P58, P60, P61, P132, P133, P134, P135

Red Army Bridge, some 15 li away to the west of Taishun County, stands across the boundary creek of Taishun County of Zhejiang Province and Lijiashan Village, Xixi Township, Shouning County, Fujian Province. Built on 6 December 1954, it is 39 meters long with a net span of 32.9 meters, 5 meters wide and 6 meters wide for its abutment. It has 15 lounge houses.

2．溪东桥（上桥、东溪桥）：12 页，13 页，14 页，15 页，21 页，58 页，61 页，96 页，110 页，148 页，149 页，150 页，155 页，156 页，157 页，160 页

修建时间：始建于明隆庆四年（1570），乾隆十年（1745）重修，道光七年（1827）修造

建造地点：泗溪镇下桥村西 200 米的东溪上

结构跨度：25．7 米

廊屋规模：廊屋 15 间，全长 41．7 米，宽 4．86 米，高 10．35 米

Xidong Bridge (upper part): P12, P13, P14, P15, P21, P58, P61, P96, P110, P148, P149, P150, P155, P156, P157, P160

Xidong Bridge, also called informally the Upper Bridge, is located in the upper reaches of Dongxi Creek, some 200 meters to the west of Xiaqiao Village of Sixi Town. It is 41.7 meters long, 4.86 meters wide, 10.35 meters high with a span of 25.7 meters. It was first built in 1570, refurbished in 1745 and repaired in 1827 of Qing Dynasty.

3．北涧桥（下桥）：1 页，23 页，58 页，61 页，95 页，102 页，147 页，148 页，151 页，152 页，153 页，154 页，156 页，157 页，158 页，159 页，160 页，161 页，162 页，163 页，164 页，165 页，167 页，168 页，169 页

修建时间：始建于清康熙十三年（1674），嘉庆八年（1803）、道光二十九年（1849）重修

建造地点：泗溪镇下桥村

结构跨度：29 米

廊屋规模：廊屋 19 间，桥长 51.7 米，宽 5.37 米，高 11.22 米。

Beijian Bridge:P1, P23, P58, P61, P95, P102, P147, P148, P151, P152, P153, P154, P156, P157, P158, P159, P160, P161, P162, P163, P164, P165, P167, P168, P169

Beijian Bridge, also called informally the Lower Bridge, is located in Xiaqiao Village of Sixi Town, bearing 19 lounge houses and 88 pillars, 51.7 meters long, 5.37 meters wide, 11.22 meters high with a span of 29 meters. It was built in 1674 and refurbished in 1849 of Qing Dynasty.

4．三条桥：22 页，23 页，58 页，60 页，61 页，94 页，95 页，110 页，111 页，112 页，115 页，117 页，142 页

修建时间：道光二十三年（公元 1843 年）

建造地点：位于垟溪、洲岭二乡交界的横溪上

结构跨度：21.26 米

廊屋规模：廊屋 11 间，桥长 32 米，宽 3.96 米，高 9.55 米

Santiao Bridge: P22, P23, P58, P60, P61, P94, P95, P110, P111, P112, P115, P117, P142

Santiao Bridge, built over Hengxi Creek at the connecting point of Yangxi Township and Zhouling Township and next to Shouning County of Fujian Province, is the oldest timber arch bridge in the history of Taishun. The bridge has 11 lounge houses with a single-eaved roof, 32 meters long, 3.96 meters wide, 9.55 meters high, with the span of a single opening of 21.26 meters. It was built in 1843 of Qing Dynasty.

5．仙居桥：22页，23页，24页，58页，60页，61页，62页，63页，64页，65页，67页，78页，97页，124页，142页

修建时间：始建于明景泰四年（1452），重建于清康熙十二年（1673）

建造地点：仙稔乡仙居村水尾

结构跨度：34.14 米

廊屋规模：廊屋 19 间，桥长 41.83 米，宽 4.89 米，高 12.6 米

Xianju Bridge: P22, P23,P24, P58, P60, P61, P62, P63, P64, P65, P67, P78, P97, P124, P142

Xianju Bridge is located at the end of Xianju Village of Xianren Township, 20 li away from the central town, and stands in the way to Wenzhou, and now Taijing Highway runs past it. The bridge has 19 lounge houses and 80 pillars with a single-eaved roof, 41.83 meters long, 4.89 meters wide, 12.6 meters high with a span of 34.14 meters, and it is the timber arch bridge now existing in Taishun with the longest span. It was first built in 1452 of Ming Dynasty and rebuilt in 1673 of Qing Dynasty.

6. 薛宅桥（锦溪桥、营岗店桥）：20 页，58 页，60 页，61 页，66 页，67 页，68 页，69 页，93 页，117 页，121 页，128 页，129 页，130 页，131 页，132 页，134 页，135 页，166 页

修建时间：始建于明正德七年（1512），清咸丰七年（1857）重建

建造地点：三魁镇营岗店街头

结构跨度：29 米

廊屋规模：廊屋 15 间，桥长 51 米，宽 5.2 米，高 10.5 米

Xuezhai Bridge: P20, P58, P60, P61, P66, P67, P68, P69, P93, P117, P121, P128, P129, P130, P131, P132, P134, P135, P166

Xuezhai Bridge, formerly known as Jingxi Bridge or Yinggangdian Bridge, built in 1512 in the Ming Dynasty and rebuilt in 1857 in the Qing Dynasty, located at the end of Yinggangdian Street of Sankui Town, is 51 meters long, 5.2 meters wide, 10.5 meters high, with a single span of 29 meters, with 15 lounge houses and 64 pillars.

7. 文兴桥：4 页，5 页，10 页，11 页，58 页，61 页，66 页，69 页，70 页，71 页，72 页，73 页，74 页，75 页，102 页，103 页，117 页，144 页

修建时间：清咸丰七年（1857）

建造地点：筱村镇坑边村村尾

结构跨度：29.6 米

廊屋规模：廊屋 19 间，桥长 46.2 米，宽 5 米，高 11.5 米

Wenxing Bridge: P4, P5, P10, P11, P58, P61, P66, P69, P70, P71, P72, P73, P74, P75, P102, P103, P117, P144

Wenxing Bridge, first built in 1857 in the Qing Dynasty, and located at the end of Kengbian Village of Xiaocun Town, is 46.2 meters long, 5 meters wide, 11.5 meters high, with a single span of 29.6 meters, with 19 lounge houses and 76 pillars.

8．双神桥：132 页，133 页

修建时间：始建于民国 26 年（1937），1955 年重建，1989 年为建双神水电站而拆除

建造地点：泰顺仕阳镇双神村

结构跨度：30 米

廊屋规模：廊屋 15 间，桥长 47 米，宽 4．8 米，桥面离正常水位高 12．7 米

Shuangshen Bridge: P132, P133

Shuangshen Bridge, first built in 1937 and rebuilt in 1955, located at Shuangshen Village of Shiyang Town, is 47meters long, 4.8 meters wide, 12.7 meters high, with a single span of 30 meters, with 15 lounge houses and 64 pillars. It was pulled down because of the constructing of Shuangshen Power Station.

9．漈下桥（福庆桥）：128 页

修建时间：始建于清道光廿八年（1848），光绪六年（1880）重建，1990 年毁于洪水

建造地点：泰顺新浦乡潘垟村

结构跨度：32．2 米

廊屋规模：廊屋 17 间，桥长 44．1 米，宽 4．8 米，桥面离正常水位高 12．7 米

Jixia Bridge: P128

Jixia Bridge, built in 1848 and rebuilt in 1880 in the Qing Dynasty, located at Panyang Village of Xinpu Township, is 44.1 meters long, 4.8 meters wide, 12.7 meters high, with a single span of 32.2 meters, with 17 lounge houses and 72 pillars. It was destroyed by floodwater in 1990.

七．石拱木廊桥

Stone Arch Timber Lounge Bridges

1．道均垟桥（水尾桥）：26 页，27 页，28 页，31 页

修建时间：民国八年（1919）

建造地点：泰顺岭北乡道均垟

拱跨及矢高：跨度 9．8 米，拱矢高 4 米

廊屋规模：廊屋 12 间，桥长 25．7 米，宽 4．6 米，桥屋高 6．2 米

Daojunyang Bridge: P26, P27, P28, P31

Daojunyang Bridge (or Shuiwei Bridge), located in Daojunyang Field of Lingbei Township and built in 1919, is bearing 12 lounge houses with a double-eaved roof, 25.7 meters long and 4.6 meters wide for the house, 4 meters high for the arch and 6.2 meters high for the house, with a span of 9.8 meters.

2．旗峰桥：32 页，36 页，37 页，38 页，39 页，40 页，41 页

修建时间：民国十三年（1924）

建造地点：泰顺翁山乡外垟村

结构跨度：跨度 14.2 米

廊屋规模：廊屋 12 间，桥长 22.6 米，宽 4.4 米，桥屋高 4.4 米

Qifeng Bridge:P32, P36, P37, P38, P39, P40, P41

Qifeng Bridge, located in Waiyang Village of Wengshan Township and built in 1924, is 22.6 meters long, 4.4 meters wide and 4.4 meters high for the house with a span of 14.2 meters.

3．桥底桥：32 页，37 页，

修建时间：民国十八年（1929）

建造地点：泰顺翁山乡外垟村

石拱跨度：3.3 米

廊屋规模：廊屋 3 间，桥长 9 米，宽 4.32 米，桥屋宽 4.5 米，桥面离正常水面 2.3 米

Qiaodi Bridge: P32, P37

Qiaodi Bridge, located in Waiyang Village of Wengshan Township and first built in the Song Dynasty and rebuilt in 1929, is a stone arch timber lounge bridge with 3 lounge houses, 4.32 meters wide and 9 meters long, with a span of 3.3 meters, 4.5 meters wide for the house, and 2.3 meters above the water level.

4．泰福桥（坑口桥）：36 页，38 页，44 页，45 页，46 页，47 页，126 页

修建时间：民国年间（1911 — 1949）

建造地点：泰顺岭北乡上洋村

拱跨及矢高：跨度 11 米，矢高 5 米

廊屋规模：廊屋11间，桥长27米，宽4.1米，桥屋高4.8米，桥面离正常水面5.8米

Taifu Bridge: P36, P38, P44, P45, P46, P47, P126

Taifu Bridge (also known as Kengkou Bridge), located in Shangyang Village of Lingbei Township, is 27 meters in its total length, with 11 lounge houses, with a span of 11 meters, 4.1 meters wide for the bridge floor and 5 meters for the arch, 5.8 meters between the bridge floor and the normal water level, and 4.8 meters high for the house.

5．温垟桥：36页，39页，48页

修建时间：光绪三十二年（1906）丙午冬吉旦，民国二十九年（1940）重建

建造地点：泰顺翁山乡温垟村

石拱跨度：4.6米

廊屋规模：廊屋3间，桥长10米，宽4.4米，桥屋高4.7米，桥面离正常水位3.5米

Wenyang Bridge: P36, P39, P48

Wenyang Bridge, located in Wenyang Village of Wengshan Township, first built in the winter of 1906 in the Qing Dynasty and rebuilt in 1940, is 10 meters long, 4.4 meters wide and 4.7 meters high for the house, and 3.5 meters between the bridge floor and the normal water level, with 3 lounge houses and a span of 4.6 meters.

6．梧桐垟桥：42页，52页

修建时间：不详

建造地点：泰顺横坑乡梧桐垟

拱跨及矢高：跨度6.6米，矢高4米

廊屋规模：廊屋3间，桥长9.4米，宽3.4米，桥屋高3.6米

Wutongyang Bridge: P42, P52

Wutongyang Bridge, located in Wutongyang Field of Hengkeng Township, built in a year unknown, is 9.4 meters long, 3.4 meters wide and 3.6 meters high for the house, 4 meters high for the arch, 3.8 meters wide for the bridge floor, with 3 lounge houses and a span of 6.6 meters.

7．霞光桥：36页，52页，53页，120页，125页

修建时间：始建于清雍正元年（1723），咸丰二年（1852）重建，同治十二（1874）重建

建造地点：泰顺横坑乡华垟村

拱跨及矢高：跨度13.2米，矢高7.3米

廊屋规模：廊屋7间，桥屋长17.3米，宽4.4米，桥屋高4.3米

Xiaguang Bridge: P36, P52, P53, P120, P125

Xiaguang Bridge, located in Huayang Village of Hengkeng Township, built in 1723 and rebuilt in 1852 and 1874 in the Qing Dynasty, is a stone arch timber lounge bridge with 7 lounge houses, double-eaved, 17.3 meters long for the house, 4.4 meters wide for the bridge floor, 4.3 meters high for the house, 7.3 meters high for the arch, with 7 lounge houses and a span of 13.2 meters.

8．毓文桥：78页，82页，83页，84页，85页，86页，87页，136页，138页，139页

修建时间：道光十九年（1839）

建造地点：泰顺洲岭乡州边村水尾

拱跨及矢高：7.6米

廊屋规模：廊屋7间，桥长22.9米，宽4.15米

Yuwen Bridge: P78, P82, P83, P84, P85, P86, P87, P136, P138, P139

Yuwen Bridge, located at the end of Zhoubian Village of Zhouling Township, between the two cracks of two hills, is 22.9 meters long, 4.15 meters wide, with a single span of 7.6 meters, with 6 lounge houses and 32 pillars. This bridge was built in 1839 in the Qing Dynasty.

9．回澜桥：78页，83页，84页，85页

修建时间：清道光廿八年开始建造，光绪二年竣工（1848－1876）

建造地点：泰顺司前镇

拱跨规模：三墩四孔，桥长85米，宽6米

Huilan Bridge: P78, P83, P84, P85

Huilan Bridge, located in Siqian Town, is a stone arch bridge with three piers and four openings, 85 meters long and 6 meters wide. It was built between 1848 and 1876 in the Qing Dynasty.

附录二　书中桥梁和建筑的专用词汇中英文对照

Appendix II – A Chinese-English Glossary of Bridges and Architectures

木平桥 timber beam bridge
简支梁桥 simply supported beam bridge
叠梁木拱桥（唐寰澄先生命名）combined beam-arch bridge (Tang Huancheng's nomination)
伸臂梁木平桥 带叠梁构造 piled cantilever timber beam bridge
贯木拱桥 interlocked timber arch bridge
编木拱桥 woven timber arch bridge
编木拱梁桥 woven timber arch-beam bridge
廊桥　lounge bridge
木廊桥　timber lounge bridge
木拱廊桥 timber arch lounge bridge
泰顺廊桥　Taishun lounge bridge
汴河虹桥　Bianhe rainbow bridge
汴水虹桥　Bianhe rainbow bridge
汴梁虹桥　Bianhe rainbow bridge
石拱桥　stone arch bridge
矶步　block bridge, Dingbu
乡土建筑　vernacular architecture
民居　residence
抬梁式 supporting beam type
穿斗式 crossing bracket type
悬山顶 overhanging gable roof
歇山顶 gable and hip roof
磉子 column base
柱子 column
院落 courtyard
寺庙 temple
重檐 double eaves
檐廊 corridor
檐角 cornice
山墙 gable wall
神龛 shrine
祠堂 ancestral hall
道路 path
藻井 ceiling
屋脊 ridge
屋顶 roof
装饰 decoration
社戏 village theatricals
风水 feng-shui
开间 frontal width
悬山顶 overhanging gables roof style
歇山顶 combined hip-and-gable profiles
四注顶、四坡顶、庑殿顶 hipped roofs

附录三　参考文献
Appendix III – Biliography

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