DOMESTIC ARCHITECTURE IN THE BEIJING AREA, 1860-1930

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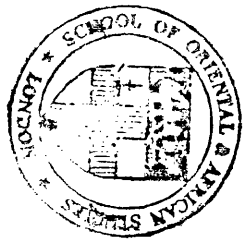

Abstract

This thesis describes the appearance, construction and function of the small courtyard house in the Beijing area, I860-I930. In the context of Chinese architecture as a whole, domestic architecture is distinguished by its non-regulated nature. It may thus be contrasted with palace and temple buildings which were constructed according to rules of proportion and sumptuary law.

The literature, both Western and Chinese, is discussed in Chapter One. In Chapter Two, three houses, whose measurements were taken, are described in detail and the measured drawings included. Three further houses in central Beijing are described to provide further material, relating to the arrangement of the courtyard.

Chapter Three lays out the full programme of construction from the purchase of land and hiring of labourers, the terms of contract between owner and foreman of the building workers to the building process itself.

In Chapter Four, various possible determinants of form are discussed, including the principle of enclosure, structural reliance on wood, climate and geomancy and orientation.

In Chapter Five, the small house is set in its context for domestic architecture in China also comprises the grander 'mansions' of the rich. All houses, whether large or small, are linked in terms of function but economic position determines the size which, in turn, determines the possiblities of the house.

The conclusions relate to the size of the construction, sizes being drawn from the measured houses and literary sources. Though the house is potentially unregulated, the buildings of a small house tend to vary very little in terms of size. This adherence to a 'traditional' norm is contrasted with the strict regulations determining the size and design of grand buildings and it is demonstrated that there is a relationship between grand and small buildings based on aspiration within a tradition.

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Introduction

The headings of the first chapter of Abbé Huc's L'Empire chinoise indicate the importance of Chinese architecture in the formation of the idea of China in the minds and eyes of early European visitors. "Le pays prend définitivement le caractère chinois - Arcs de triomphe et monuments érigés en l'honneur des vierges et des veuves - Palais communaux pour les grands mandarins en voyage".(1) It also suggests that the most striking architecture noted by travellers was monumental and official, and the concentration on this aspect of architecture has dominated western writing on the subject ever since, to the detriment of a knowledge of traditional Chinese housing. "...Ils connaissent l'univers avant la maison, l'horizon avant le gîte."(2)

In order to redress the balance, this thesis sets out a description of the northern Chinese house of the Beijing area, based on measurements taken in 1976 and observations of several courtyard houses. The process of building in the late nineteenth and early twentieth centuries is described, and the use, function and development of the courtyard form in Beijing are discussed. Conclusions drawn particularly from the dimensions of the houses measured point to a real division between grand buildings such as those mentioned by Huc and the houses which have received so little attention.

This lack of attention is apparent both in western and Chinese sources. The foremost historian of Chinese architecture, Chen Mingda, expressed surprise that anyone should want to work on courtyard houses as he considers that it is now "too late, there are no pure examples left." The courtyard in which he lives (a few hundred yards west of the Great Hall of the People) is an example of this loss of purity. A lean-to has been constructed in the court, pushing the flower beds

aside and Chen himself has extended his study and bedroom by building out over what was once a verandah. Though he was careful to re-use the original lattice windows, and preserve the appearance of the facade, the originally spacious courtyard has shrunk.(3)

Together with the lack of pure buildings, he emphasised the lack of source material. In the course of a long meeting in his study which is crammed with Chinese and Japanese books on Chinese architecture, he could think of only four books on domestic architecture. One was Liu Dunzhen's short monograph on the history of Chinese domestic architecture(4) which in considerably less than a hundred pages surveys the history of domestic building from the stone age to the Qing, including minority forms; another was Liu's history of Chinese architecture which covers a comparable time span and devotes only a few pages to domestic architecture.(5) He also mentioned Werner Blaser's book of photographs of courtyard houses(6) which demonstrates the author's ingenuity in the use of very scanty access and Wang Qiming's book on Beijing courtyard houses which was published in the late 1950s.(7)

Wang Qiming's book, the only monograph devoted solely to the domestic architecture of Beijing, is not available in the west, nor in Beijing University Library, nor in Qinghua University (where the copy once held in the architecture department is missing). The author herself, who works for the Architectural History Society, no longer has a copy since most were destroyed during the Cultural Revolution and the single remaining copy was lent to someone who never returned it. She said that it was very short and "not worth bothering about" which may be modesty.(8) Thus recent political events in China have combined with the pressure of population and the ravages of time to make the study of the Beijing courtyard house even more difficult, and even more urgent.

The choice of Beijing as a subject of study

Restriction of the study to one city and its environs was not merely dictated by practicalities. The houses of Beijing represent only one style in the remarkable regional diversity to be found in China. Certain factors, aspects of the cultural and functional role of the Beijing house are common to many other housing types which differ only in details of plan and ornament. The Beijing house is, like those of the North-east and northern coastal regions, one of the simplest types to be found in China and may thus be useful in providing the basis for the examination of more complex structures found elsewhere. The simple courtyard plan, characteristic of Beijing, is also found very extensively in other parts of China; single-storied courtyard houses with little ornamentation and flattish pitched roofs dominate in the eastern parts of rural China, from the Yangtse northwards into Dongbei.

In the Northwest, in Xi'an and down towards Luoyang, the same simple courtyard plan is found but the structures are often two-storied with a single-pitch roof sloping down into the courtyard at an acute angle. In rainy Sichuan, roofs have longer, deeper eaves with simple L-shaped supporting brackets. The houses are often white-washed with darkened timbers, creating an effect reminiscent of Japanese domestic architecture or English half-timbering. In the areas south of the Yangtse, the courtyard is increasingly enclosed, with a small opening in the roof offering light and limited ventilation. These southern buildings are often two-storied and show much more elaborate roofs. These range from the smooth inverted 'U' Dutch gable found in Guangdong, Sichuan and Yunnan and the stepped gable found in Jiangxi (and less often in Yunnan), to the elaborately curved and carved roof ridges of Fujian.(9) In plan, these apparently different house forms are all related to the simpler Beijing courtyard house. Thus, leaving the distinctions of detail for

later studies, an examination of the relatively undecorated Beijing house with its clear, open courtyard and single-storied buildings grouped in the almost universal plan is fundamental.

Selection of houses for study

Field work in the form of measuring three Beijing houses was carried out in 1976. The selection of the houses was necessarily arbitrary for contemporary political constraints meant that official support was impossible. There were no channels to permit non-Chinese scholars to carry out research projects in China and the educational system hardly facilitated research projects carried out by Chinese, either.

The three houses measured for the thesis were found through the help of an Australian diplomat and friends and teachers at Beijing University. Only one was measured without much difficulty, the Z house which is the most decorative of the three with its carved panels in the facade and elaborate lattice. The inhabitants of both the H house and the W house were very talkative which meant that in the case of the H house, much of the measuring was done in the dark, after an afternoon of conversation. There was a further disaster with the H house for it was not possible to photograph it in winter, for very much the same reasons. A visit was arranged in July when the evenings were longer and photography was possible. By the summer, however, the house was practically invisible behind and under a vine which had grown to shade the courtyard. The photographs are mostly of vine leaves with glimpses of building behind.

To measure the W house, other people came along to entertain the inhabitants during the work. It was the most charmingly set of all the houses, in the grounds of the University, near the lake area in the northern part of the campus. It was concealed by trees and an earth

bank, behind which was a wide clearing planted with vegetables and flowers. The house itself had geraniums on all the sills and poppies in pots that stood on green ceramic barrel seats by the door. The house, a single building, not south faced east, in defiance of traditional orientation but was thus provided with a pleasant view across the vegetable patch to the wooded bank. Though its orientation sets it apart from the other houses measured, its structure is typical (see p.23).

In addition to literary sources used to illustrate such aspects as the building process and the function and history of the house in Beijing, further study was made of a series of houses on Jinyu hutong (金鱼胡同) behind the Peace Hotel (Heping fandian (和平饭店)), immediately north of the East Wind market, off Wang fu jing street in the centre of the city. These courtyards were overlooked by the hotel and their plan is, in consequence, clearly visible. One aspect of surviving courtyard houses in Beijing which is demonstrated by this Jinyu hutong group and both the H and Z houses is the prevalence of additions, either temporary or permanent, earlier extensions in the form of 'ear rooms' added to the ends of existing buildings (or the Z house extension which wraps around all but the facade.

Restriction in time

The period 1860-1930 was chosen for a variety of reasons. Practicality dictates restriction to the late Qing period for the structural problems that dog the historian of temple and palace buildings also affect the study of domestic architecture. Less grand structures were particularly vulnerable to damp for they were rarely erected on stone platforms like temple halls and usually had only an earth floor. Though the wooden columns were protected to some extent by stone bases, they eventually rotted from the bottom up. Roofs were affected by rainfall and covered in waving grasses unless regularly maintained in spring and autumn. Further problems were created by occasional earthquakes and fires.

Social problems in the late nineteenth century led to overcrowding[10]

which provoked constant addition within the courtyard which meant that the likelihood of finding early sections or 'pure' early Qing or Ming domestic architecture grew increasingly unlikely. The scale of rebuilding that continues annually in Beijing's hutongs (lanes) indicates that houses undergo gradual but almost constant transformations. The rebuilding and repair rarely involves total transformation for salvageable parts are stored and re-used whether they are brick, timber or tile. Thus a house still standing will almost certainly have been altered over the last couple of hundred years but may still contain timbers, bricks and tiles and an overall plan that date back to the Ming or earlier.

For these reasons, surviving courtyard houses in Beijing may be considered to date from the late Qing period unless there is evidence for an earlier date. Since courtyard houses were still being constructed on the outskirts of the city, behind the zoo, in 1976, it would be possible to extend the terminal date. By 1930, however, a substantial number of 'western-style' dwellings were being constructed in the suburbs and western style shops were beginning to replace Chinese ones on the main streets of major cities.(11)

The first considerable number of young Chinese architects to study abroad went in the 1920s(12) so by the 1930s, their influence was beginning to be felt. By 1933, 'western-style' houses were sufficiently numerous to be included in the house tax categories drawn up by the police force.(13)

That the 1930s was a crucial period in Chinese domestic architecture when new foreign forms were beginning to affect traditional building is borne out by Wang Daguan's long handscroll illustrating Beijing in the 1930s. A native of Beijing, Wang grew up in the Chaoyang area (朝阳) and later worked there as a rickshaw puller.(14) His painting follows the tradition established by Zhang Zeduan in the Northern Song with his long scroll illustrating daily life in Kaifeng(15) and which was later popular in the

Qing, used to illustrate imperial journeys[16] through major cities. Wang's painting takes the viewer into Beijing through the Chaoyang gate and depicts street life and the buildings lining the streets. These are mostly traditional but as the painting takes you towards the shopping centre of Wang fu jing (王府井), a few modern, western facades are visible. In one courtyard house there is a scene showing the arrival of a new bride into the home. Old, traditional furniture is piled in a side court and new, western-style furniture is being moved into the buildings. Large wardrobes and western-style beds had a considerable influence on domestic architecture in the 1930s and were probably responsible for the almost total absence of kang (炕) in the city today. As these old brick beds took up almost three-quarters of a small room, they made it almost impossible to fit any western-style furniture in. Rather than adapt, the inhabitants of Beijing knocked out the kang to bring in new, fashionable furniture.[17] As most observers agree that the 1930s was the period in which such radical changes were taking place, 1930 has been chosen as a terminal date for the thesis.

1: Chinese

Chinese literature on Chinese architecture has stressed many of the features remarked upon by early western visitors, features of grand and elaborate building. There was no substantial literature on architecture until the foundation of the Institute for Research in Chinese architecture in 1930 and the subsequent publication of the Association's journal.(1) Research concentrated upon the most perfected buildings, to the detriment of domestic architecture, an inbalance which continued the view reflected in the scanty earlier material.

The architectural tradition in China had a greater resemblance to that of medieval Europe than any later western system. Great buildings were erected by anonymous craftsmen to the glory of church and state, the anonymity of the builders only briefly broken during the Song with the publication of the Ying zao fa shi (营造法式).(2)

A combination of theory and practise, the Ying zao fa shi prescribed proportion based on elements of the bracket, an element that was proscribed to builders of simple dwellings in the Qing dynasty and possibly earlier.(3) The division between major buildings and domestic architecture was established in practise and the distinction was reflected in literature with the result that very little is known about domestic architecture in traditional China.

The Ying zao fa shi treats grand buildings in general, though recent research has established its connection with particular constructions,(4) but more specific writing on building in Beijing reflects its influence. In Beijing, the dominance of the Forbidden City and similar religious and secular buildings associated with the city's function as capital have obscured the picture of ordinary housing. The layout of the city has been given much stress with no reference at all to the domestic buildings

that lay within the grid of streets inside the walls and gates.(5)

Since 1949, architectural historians, notably Liu Dunzhen, have shown interest in vernacular building, an interest partly dictated by the new stress on history created by people rather than emperors and on the previously neglected skills of anonymous craftsmen. Though Liu has written a brief monograph on the history of domestic architecture (covering the Stone Age to the Qing in 44 pages)(6) output has still been small and the only significant published monograph is on a group of rich merchants' houses in Anhui.(7)

2: Early Western accounts of Chinese architecture: stress on the bizarre

Chinese writing on architecture stresses grand building with practically no mention of housing and early Western writing shows the same tendency. Even where such writers as Huc mention housing, they bring a further prejudice, a preference for southern styles. Huc travelled far enough to view both northern and southern building and was sufficiently careful a diarist to record differences: "Les constructions du Nord sont toujours inférieures à celles du Midi, surtout dans les villages. Dans les maisons des riches, il y a ordinairement plusieurs cours, l'une derrière l'autre: l'appartement des femmes et les jardins sont a l'extremité. L'exposition du Midi passe pour le plus favorable. Les fenêtres occupent tout un côté de l'appartement; elles présentent des dessins tres-variés et sont garnies de talc, d'une espèce de coquille transparente, ou de papier blanc ou colorié. Les bords des toits sont relevés en forme de gouttières, et les angles, terminés en arc, représentent des dragons ailés ou des animaux fabuleux."(8) Clearly, the South of China offered more, in the way of architectural curiosities, to the Western visitor.

The Abbé Huc saw China for himself and is one of the earliest

travellers to make conscientious differentiation between north and south in building. To discover how much the South of China formed the European idea of Chinese architecture, it is necessary to look at the earliest publications on China which mention building and, above all, to examine illustrated works for they have affected the imagination beyond the possibilities of the printed word.

The earliest volume devoted to the architecture of China to be published in Europe was William Chambers' Designs of Chinese building... in 1757, with an explanatory text accompanying engravings made from Chambers' drawings of buildings in Canton.(9) Chambers acknowledges the possibility that the buildings of Canton might not necessarily be representative, "it may be objected that the suburbs of a sea-port cannot furnish the proper means for deciding the taste of a nation..." but counters such arguments with two points, first stressing the importance of Canton itself, "one of the most considerable cities in Asia and in many respects inferior to none in China," and secondly, he reveals that the stereotype of unchanging and unvaried China has already affected the contemporary view of architecture for he quotes, "Du Halde observes that there is such a resemblance between the cities of China, that one is almost sufficient to give an idea of all; and the same remark may be made on their building." His own opinion is formed by such observations but based on different sources, "had I been permitted to range over the whole empire, no doubt I could have swelled my work with more examples; but if I may be allowed to judge from such imperfect things as Chinese paintings, they would all have been in the same style."(10)

In the second major collection of illustrations of cities and buildings of China, those published to accompany Staunton's account of the Macartney Embassy of 1793-4,(11) the suggestion that architecture is everywhere the same in China has been incorporated into the engravings

which, whether they depict 'A view of the gardens of the Imperial Palace in Pekin', 'Chinese barges of the Embassy passing through a sluice on the Grand Canal' or a 'View of the suburbs of a Chinese city' (evidently geographically a southern city for the engraving appears late in the series which follows the path of the Embassy), the distinctive features are exactly the same. Wherever there is a roof, it has a concave ridge and elongated eaves which project and curl upwards, their upper surface decorated with curling dragons. Thus, if we look for an internal comparison between north and south in building style, we find none but if we compare the engravings with real buildings, there is a difference between north and south which has not been recorded in the engravings of the Staunton volume. For example, in such lavish southern buildings as the temple at Fo shan, (佛山), the Zu ci miao, (祖祠庙), there are indeed dragons with curled and humped backs on the eaves and ridge acroteria whilst in Beijing, all major buildings that have eaves ridge figures have the same rigid and upright series of lion dogs. Siren's photographs of Beihai park[12] reveal garden buildings with slightly raised eaves but a straight roof ridge and an effect of horizontality whilst Alexander's version[13] shows an elongation in the vertical plane as well as concave ridges and upturning eaves whose angles have been greatly exaggerated.

Whilst Chambers had been restricted to Canton, William Alexander, draftsman to the Macartney mission, travelled from south China to Beijing and back and was thus able to see buildings in both places where Chambers had had to rely on the accounts of Jesuit missionaries. The itinerary of the mission may have been significant in helping to form Alexander's view of Chinese building for his first sight of China was Canton where the southern style incorporates the soft, curved lines already made familiar in the West by Chambers.

A further influence may be found in Staunton's text, published with the engravings. He discusses architecture with particular reference to the Canton area, "The attention, as to ornament, in these buildings was confined chiefly to the roofs, which ... were contrived in such a form as to imitate the inward bend of the ridges and sides of canvas tents, or of the coverings of skins of animals or other flexible materials, effected by their weight; a form preferred, perhaps, after the introduction of more solid materials, in allusion to the modes of shelter to which the human race had, probably, recourse before the erection of regular dwelling houses. On the ridges of the roofs were uncouth figures of animals ..."(14)

The 'tent theory' of the evolution of Chinese architecture was a remarkably persistent one and may have affected Alexander's view of buildings, softening the more rigid lines of northern construction.(15)

The influence of these early illustrations of Chinese architecture was considerable, both in later illustration and in later writing on China. Bertin's China: its costume, arts, manufactures & c., (1824)(16) has many illustrations drawn directly from the Staunton volume and Allom's engravings of 1841(17) reproduce exactly many of Alexander's engravings but with an even greater emphasis on the vertical which, in the case of the massive walls and palaces of Beijing, directly contradicts the actual impression which is one of horizontal lines.

Certainly his theory influenced Staunton's view of the Forbidden City of Beijing, "Those roofs, uninterrupted by chimnies, and indented in the sides and ridges into gentle curves, with an effect more pleasing than would be procured by long straight lines,"(18) which is not borne out by an examination of the buildings themselves.

Perhaps the most interesting aspect of Staunton, Chambers and

Alexander's view of China and its building is the effect that it had on later writings where the southern style of building is taken as the norm.

That this happened very early is clear from a remark in Macartney's journal where he complains that, "the royal garden falls very short of the fanciful descriptions which father Attiret and Sir William Chambers have intruded upon us as realities," failing to note that the only reality Chambers could have intruded upon him would have been a southern one, a Cantonese one, far removed from the royal gardens of the North.(19)

The transposition from illustration to narrative is a clear one for whilst Chambers and Staunton are guarded and literal in their texts, even if the pictures which accompany the texts are less so, later texts are clearly based on the engravings rather than the literature.

One of the first literary compilations based on the accounts of travellers is The Chinese Traveller of 1772, an anonymous book "collected from Du Halde, Le Compte and other modern travellers" which includes a detailed description of roof construction of the southern type (without specifying the restricted geographical location) but which is most interesting in its description of a typical pagoda. "There are few of these pagodas that have not a great tower which stands by itself terminating in a dome and persons go to the top by a staircase which winds round about it; in the middle of the dome is commonly a temple of square figure..."(20) This description is clearly taken from Chambers' drawings and in particular to his illustrated pagoda where he himself says, "I have omitted representing in the elevation, the stairs that lead to the different stories, because it would have rendered the design confused."(21) Chambers never clearly defines pagodas and temples, making it hard for the compilers of The Chinese Traveller to disentangle the two.

The section on Chinese architecture in the Penny Cyclopedia of 1837 gives an indication of the state of received knowledge of Chinese architecture in the mid-nineteenth century. The article stresses grand and official buildings and their ornament, "Chinese architecture does not appear to be founded on the best principles. As in all semi-barbarous nations, outward show is the greatest object." In more detailed sections, the primary source is Chambers and, as with the Chinese Traveller, there is a confusion between text and illustration and a failure to note Chambers' tentative limitation of his position as expert on the architecture of the whole country. Houses are described in terms better suited to temple construction with reference to what appears to be bracket support, "Wooden columns, so placed as to support the roof, are common ... an architrave of wood placed on top of them runs through the wall of the house, and a beam which is carried through the upper part of the column, and passes through the wall also, is connected with the architrave on the outside of the house." When it is remarked that, "not the least singular appearance in a Chinese house is the door, which is often a complete circle; the window frames and sashes are formed of small panels of various forms moulded out of clay,"(22) it is quite clear that, if the description fits any house at all it is that of a Canton merchant illustrated by Chambers (and similar examples in Allom) where moon doors are evident and the clay windows are typical of the construction of the southern house-garden complex where the wooden lattice of the halls and rooms is echoed by external lattice in clay and tile set into garden walls to frame views along corridors. The Penny Cyclopedia's description of the roof is, again, southern, both in form and construction, "The roofs, which are slightly constructed out of bamboo,

are often double, and resemble one roof rising out of the other: they turn up at the eaves, at the angles of which are hung grotesque figures of dragons, &c."[23] where the double form may be found in monumental building (as in the north) but the lightness of construction is entirely southern and bears no relation to the thick couch of mud and lime that insulates the northern house.

The received view of Chinese architecture, exemplified in the Penny Cyclopedia was based on the monumental building of the South. This was largely because the earliest writers and artists to visit the country mostly entered through the south and their first sight of the country formed an indelible impression which, in the case of William Alexander, was sufficiently strong to affect his view and drawing in the north. It may also be that the buildings of the north are both (in their domestic form) more drab and unornamented and (in their monumental form) more solid, neither being features which were so attractive to visitors to an exotic country seeking differences rather than similarities. The pagodas with their upturned eaves, the light lattice garden pavilions of the south were all more different than the solid structures of the north.

3: Twentieth century western writing

Twentieth century western writing on Chinese architecture was less dominated by the fascination of weird and wonderful southern roofs than earlier western accounts but still shows underlying themes which have detracted attention from domestic building. One of the strongest themes to develop in such writing was that first expressed by Bushell who wrote of the "monotony" of Chinese architecture since all buildings were "reduceable to one single formula" where "the general plan of a Buddhist temple resembles that of a secular building."[24] Bushell was antici-

pating the theme of 'unity' (rather than 'monotony'), a development which grew from analytical writing on building following Viollet-le-Duc.(25)

Bushell's stress on the reduction of the Chinese architectural plan is exemplified in the majority of recent works on Chinese architecture where the underlying pattern is seen as dominant and variations are ignored in favour of the thesis of unity. Rolf Stein's view, "Le macrocosme se reproduit dans de nombreuses microcosmes,"(26) is echoed by Michele Pirazzoli-t'Serstevens, "l'espace architectural se présente donc comme une série de mondes clos, complets, unités indépendantes de plus en plus petits, de la ville à la maison privée, qui répètent en microcosme les formes des unités plus vastes. La maison peut être regardée comme une ville miniature, et la ville comme une maison à une échelle immense."(27) The desire to simplify Chinese architecture down to innate structrues, to underlying forms has also been expressed by Boyd and by Paludan, who says, "A Chinese palace such as the Forbidden City is simply a vast enlargement of the peasant house."(28)

The reduction to 'cells', microcosm-macrocosm interpretation of Chinese architecture owes something to an interpretation of the Ying zao fa shi which, with its units determining proportion, coincided with current western ideas in architecture;(29) another strand in the western view of Chinese architecture has been the functionalist approach, which, unlike the encompassing view, concentrates more closely on domestic architecture.(30) The Chinese house is praised as it is seen to present a simple solution to practical requirements.(31) Its structure is considered to be relatively earthquake-proof and thus durable.(32)

The latter approach has been over-extended for not only does it ignore the impractical aspects of Chinese domestic architecture but in wider application, functionalism alone has been found to provide an

inadequate explanation for the variety of vernacular buildings. Many people have built in apparent defiance of climate and available materials, just as the Chinese did.(33)

In this thesis, available writing in both Chinese and Western languages has been used to build a description of the building process in the Beijing area and an account of the building type. The measured buildings, set against this background, provide material on the types of building found, their relationship with other buildings in other parts of China and, in particular, provide information on the concept of scale in domestic architecture which contrasts with that of grander buildings.

1: Three Houses Measured

The H house is on the south side of Di an men dong da jie (地安门东大街), north of the Mei shu guan (美术馆) and the Forbidden City. The house as it now stands comprises east and west wings on either side of a courtyard which is bounded to the north and south by a wall. The north wall is pierced by a gate, the main entrance to the house. The inhabitants were of the opinion that there had previously been a north wing to the house but that this was lost when the road was widened.

The area covered by the H house was described by its owner as five jian (间), or five bays. The term jian which means the space between two columns or bay is used throughout the thesis. In most cases it would be possible to translate it as 'room' for in the majority of houses division into rooms follows the structure and is made according to bays. It is not, however, invariably true for a three jian building might just as well be divided into two rooms, one twice the size of the other. It is for this reason that jian has been used, preserving the slight ambiguity of the Chinese, which has, in any case, no reference to *division.*

The east and west wings are both flat-roofed, two jian structures with narrow half-jian, corridor-like wings added on the south side. The roofs of the added wings are lower than those of the original two jian (these added wings have been shown in the plan but not in the elevation of the H house).

The two wings are very typical structures. There is a low stone platform as a base for the construction. The facade consists of a grey-plastered apron wall to waist height. Both flank walls are solid, also

grey-plastered. In the centre of each jian is a wooden door with a solid door panel and four small lights set in the upper half of the door. Above the apron wall, on either side of the door is a lower row of large fixed lights and above, a double row of small fixed lights. In the H house these had all been glazed in the early part of the century but they still retained the form and design of paper windows. The apron wall is grey as is all the brickwork and the wooden parts of the buildings have all been painted a deep terra-cotta red, a colour which is commonly seen on woodwork in the Beijing area.

Above the windows is a fascia-board which runs the length of the building. Above this is a thick plastered roof of greyish lime and clay, carved into an angular profile (see detailed drawing).

Though the two wings resemble one another in design and elevation, the west wing is twice as deep as the east wing, doubling the depth of a building which, in the case of domestic architecture, often means that the back part is ill-lit and ill-ventilated, is a common method of increasing the area of a dwelling. In both wings, the jian is 2.43m. wide and both wings are divided along the lines of the main beams. The house is strictly a 5 jian house if the two southern half-jian are included but the extra, double depth of the west wing adds greatly to the available space.

The courtyard is double the depth of the east wing, approximately the same depth as the west wing. It is roughly square and paved with stone. In a walled flower bed against the southern wall is a vine which is trained over the courtyard in the summer in place of the traditional tree, to provide shade.

The gate in the northern wall has an L-shaped spirit wall just inside it to protect and conceal the interior when the gate is opened.

of the courtyard

The surrounding walls are of dark grey brick but from about 2 feet above the ground they are white-washed. The spirit wall has the character 'fu' (福) painted in black on the white-washed surface, for luck. At the top of the wall to the south and on either side of the gate, grey semi-cylindrical roof tiles have been set to form an open-work floral frieze.

The kitchen and bathroom were, typically, late additions to the house and are situated in the narrow addition to the west wing. The west wing itself is the main living area. The northern-most jian is the living room with one bed at the back. The adjoining jian is the master bedroom. The eastern wing is rarely used now for one of the two daughters of the house is abroad. Her elder sister sleeps in the northern jian and the adjoining room is used for storage. In the summer, the courtyard becomes the dining room and meals are taken out of doors in the cooler air under the vine leaves. In winter, the family spend most of their time in the living room which is heated with a small stove which burns coal balls. The other rooms in the house are not heated and the replacement of the window paper with glass means that they are also poorly ventilated.

The W house and the Z house are both situated within the grounds of what is now Beijing University. They antedate both Beijing University and the previous institution on the site, Yenching University. When Yenching University was founded in 1916,(1) it took over a site near the Summer Palace which comprised several ruined gardens of mandarins connected with the Qing imperial household such as He Shen's 'Garden of modest gaiety' and Mi Wanzhong's 'Ladle garden'.(2) The best preserved garden section of the campus is on the northern side and it is there that the W house and the Z house are to be found. The W house was a gate-keeper's house and the Z house, built in the form of a simple three-jian building

with later additions, was used as a hunting lodge. Both are near the lake in a landscaped area.

The W house, to the west of the lake, is the simpler of the two. It is built in a hollow behind a bank which conceals the lake and this landscape provides a courtyard setting for the house which is a free-standing three jian structure facing east. This alignment is most unusual in a Chinese house but it is required by the surroundings. Though its setting and orientation are unusual, the construction is typical, more typical than the flat-roofed H house.

The roof is double pitched and the tiles are laid smoothly over the ridge. They are grey, unglazed and appear in three forms. Semi-cylindrical imbrex tiles run from the eaves, over the ridge and between them lie flatter tegulae. At the eaves, each imbrex ends in a circular end tile with an impressed design of the character 'xi'(囍), happiness. The tegulae end in fan-shaped drainage tiles with impressed dragon designs so that the eaves line is subtly decorative.

The flank wall to the south has not been altered and is built in grey brick, following the line of the rolled pitch of the roof. Along the line of the roof, grey mud and plaster are built up into a layered series (see drawing p.40).

The house is not set on a platform but the interior floors are stone-flagged. As in the H house, there is a grey-plastered apron wall to waist height along the facade. The central jian of the three has a door, set centrally but the rest of the facade, above the apron wall consists of two rows of lights, a lower row of small fixed lights and upper row of larger opening lights. The door is double, the outer part a screen door, the inner one has a solid lower panel. As in the H house, the original paper lattices have been replaced with glass and this has altered the detail, though not the fundamental design of the windows. Just as in the H house, the woodwork is painted dark red.

The flank walls project beyond the façade.

The three jian in the W house are slightly smaller than in the H house, 2.133 m. as opposed to the 2.43 in the H house. The house is divided in the interior into two, one two jian section used as a sitting room, the smaller, northern jian as a study. The bedroom is in an 'ear room' which was added later to the northern end of the building and the kitchen and bathroom are also situated in later additions at the back of the house.

Though this is not an enclosed courtyard house, the natural surroundings offer the effect of enclosure; the house is hidden from the path by the lake by a tree-covered bank and the space in front of the house is used as a vegetable and flower garden, surrounded and enclosed by substantial trees. There are geraniums along the external sill (formed by the apron wall) and on two ceramic garden seats on either side of the central door.

The Z house, not far from the W house on the north side of the lake, is the most elaborately detailed of the three. It also preserves some of the detail that has been lost in the other two.

Basically, the house is close to the W house, but it is grander. It is a three jian building and south-facing. The original building has been greatly expanded; the two jian on either side of the central jian with the door have been extended forward and a flat roof added to cover the extension (that can be most clearly seen in the drawing of the flank wall). Seen from this angle, the extension is clumsy but from the front it is well-integrated.

The roof treatment resembles that of the W house; the tiles run smoothly over the roof ridge and the same mixture of semi-cylindrical imbrex and flatter tegula is found. The eaves tiles have disappeared

in the roof addition which is flat and grey-plastered like the roof of the H house. There are, however, a couple of the inverted fan-shaped drainage tiles set at the eaves of the flat roof; these are yellow glazed but bear the same double-dragon motif as on the W house. The treatment of the roof profile line on the west flank wall, however, provides an illustration of the high decorative level of the Z house for it closely resembles that of out-buildings in the south-east corner of the nearby summer palace. There is the same sculpted line, following the roof profile. Above it is set a row of inverted fan-shaped grey unglazed tiles, surmounted by a row of circular tiles with round end tiles bearing stamped suspicious characters. Above that is another linear band of grey plaster which follows the roof line though it is built up above it. This is one of the two characteristic flank wall decorations found on fine buildings in Beijing and is only found on roofs where there is no built-up ridge but where the rows of tiles curve over the ridge smoothly.

The house is set on a high stone base, higher than that of the H house. Beside the steps up to the platform is a mounting block, a natural stone with a foot-sized dent in the top.

The facade has been altered by extension but the central jian is original. In the central jian, there is a door in the middle with a solid lower panel, the upper half consisting of a decorative geometric lattice, now set with glass. On either side there are apron walls of carved wood with the same geometric lattice windows set above.

The newer jian on either side are very similar in facade treatment to those of the H and W houses. There is a grey plastered apron wall above which are set two rows of windows which yet preserve more traditional features than found in the other two houses. The lower row consists of a large fixed light with a narrow band of geometric lattice

around it. Above is a row of large opening lights made entirely of geometric lattice. These are hinged at the top and open with a prop at the bottom. (See drawing, p.42)

Like the W house, the Z house is a single building, facing the lake and it does not have the same natural courtyard in front of it. Nevertheless in construction and design it is a very characteristic domestic building. The central jian is a reception room. To the west is a bedroom and to the east is a sitting room which doubles as a bedroom at night. As befits the grandest of the three houses measured, the jian sizes were larger. There was also a difference between the central jian which was 3.5m. wide and the two side jian which were 2.8m. It is not uncommon for the central jian to be emphasized in this way because of its extra religious and ceremonial function.

The colours used in the Z house are the same as those in the H and W houses though the recessed central jian has been whitewashed. The woodwork is all deep red and the roof is grey as are the apron walls. The fine carving on the lower part of the central jian is indicative of the aristocratic history of the building. In the opinion of the owner, whose house had been measured by the Academy of Sciences, the house was over 150 years old. The inhabitant of the W house thought his was over 100 years old and the inhabitants of the H house thought that theirs was perhaps 100 years old as it stood.

2: Courtyard houses in central Beijing

In addition to the measurements of the three houses which reveal most about the structure of the individual buildings, surveys of houses within the city of Beijing provide more information on the plan of the courtyard house.

Around a courtyard perhaps 9m x 9m are free-standing buildings surrounded by a wall. In some cases, part or all of the back wall of

the building form the enclosing wall. The courtyards are called either "4-sided" or "3-sided" depending on whether the southern side has a building on it or simply a wall with a gate (the latter is the three-sided courtyard type). Four-sided courtyards are more common in the richer houses. The buildings are all one storey high and consist of three or five jian. Three typical courtyard houses standing side by side at the back of the Peace Hotel on Jin yu hutong in the Dong cheng qu (东城区) area of Beijing may serve as examples.

Courtyard house 'A' is a four-sided courtyard. The courtyard is about 9m x 9m. The main building, the northern building, is five jian,(3) and slightly raised above ground level (by about 15 cm.) It has a verandah with columns and a very low wooden balustrade across the front of the verandah (in between the columns with a gap in the central jian). The roof is covered in grey simi-cylindrical tiles with a raised roof ridge with small projecting 'owls tails'(4) at either end. Very narrow (about half-jian) 'ear' buildings have been attached to each gable end wall.(5) The east and west wings of the house consist of three jian buildings with 'ear buildings' of two jian added at the southern gable end wall. The main three jian part of each wing has a roof similar to that of the main northern wing, with a raised ridge and projecting owls tails but the subsidiary 'ear' building has a smooth roof ridge with a built up line along the peak of the flank wall, decorated with tiles along the southern end, similar to the treatment of the flank wall in the Z house. These combinations of roof form are frequently found in Beijing in the same area though not always in the same courtyard.(6)

The northern building is a characteristic construction. The facade consists of a brick apron wall to waist height, above which are set two rows of lattice windows. Though in modern Beijing, glass is now often found, especially in the lower lattice, the traditional form

was to have a row of fixed lattice below and then a hinged upper row which could be swung open in summer (as in the Z house). The entrance door is in the middle of the central jian.

The southern end of the courtyard is enclosed by a long building which includes the gate. This, like the other major buildings, has a raised roof ridge.

Courtyard B has been substantially rebuilt in recent times(7) but the most distinctive features remaining are the main, northern building which is three jian wide but double-roofed, like many shop buildings.(8) The rooms inside are, therefore, twice as deep as in a single-roofed building of the same size, as in the west wing of the H house. The double roofs have a smooth curved roof ridge with the same decorative feature as seen on the side wings of Courtyard A, a raised line along both flank walls, following the double curve of the roof.

The west wing (the only other one remaining) shows that variation was quite possible within one courtyard for its roof is lower and broader than that of the double-roofed northern building and its roof ridge is raised. Viewed from above the two wings cover very much the same area so the more acutely angled double roof of the northern wing may have been a decorative way of covering the same living space as that of the plainer side wings.

The treatment of the buildings is otherwise similar to that of Courtyard A, with waist-high apron walls of grey-plastered brick and decorative lattice of fine wood backed with paper set above the walls.

Courtyard C is the simplest of the three. The southern wall has been rebuilt but the northern and side wings are intact. There is an old tree in the northwest corner of the paved yard (which is much shorter than that of Courtyard A). The main northern building is three jian with two lower 'ear' wings added at either end (each of two jian).

The building is about a foot above the level of the courtyard whilst the east and west wings are on ground level. All three have the same roof form, with the raised ridge but only the two side wings have raised 'owls tail' points to the raised ridge.

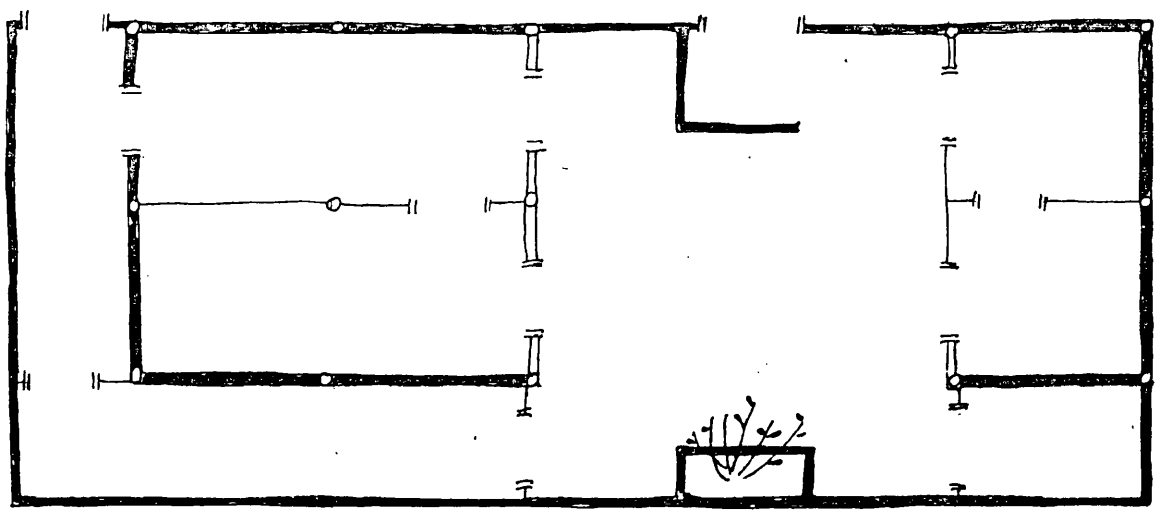
Similar groups of houses seen behind the Qian men (前门饭店) hotel in Xuan wu qu (宣武区) (part of the old 'Chinese city' as opposed to the 'Tartar city' of which the above-mentioned houses were part)(9) show the same forms of organisation but are considerably less expensively built. It is rare to see the northern (or most important) building raised above ground level and the roofs (traditionally the way of determining how much a house was worth and consequently how much it cost to rent) show the poorer possibilities of covering. The roofs are all grey and many are tiled (either with a raised ridge or the smooth curve) but some are flat and simply covered with a grey lime mixture (like the roof of the H house). Even in pitched roofs, some show the cheaper variant of tiling the ridge area and the eaves line but leave the centre of the slope to be plastered with the grey lime mixture. The facades of the houses are, however, similar. There are no buildings with verandahs as in Courtyard A but the walls and lattice partitions are the same.

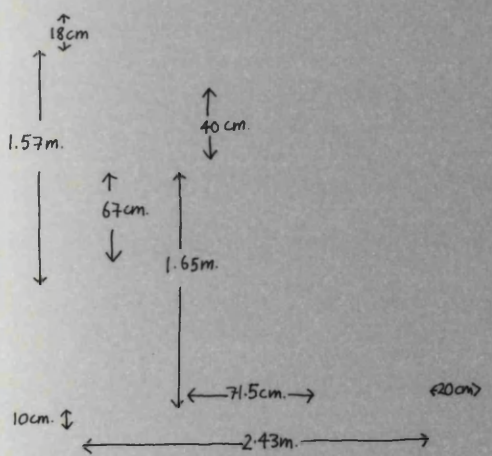
THE H HOUSE

PLAN

SCALE (METRES)

N

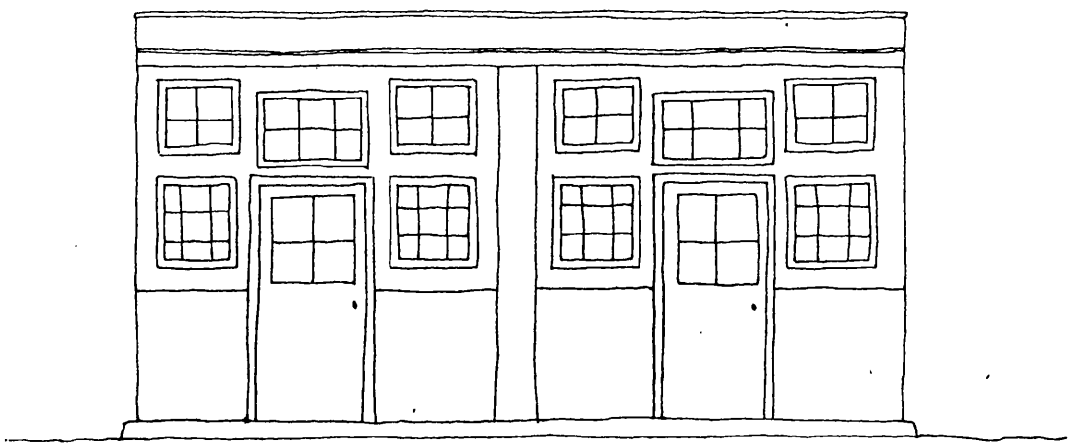



18cm
1.57m.
40 cm.
67cm.
1.65m.
71.5cm.
20cm
10cm.
2.43m.

THE H HOUSE

ELEVATION WEST WING

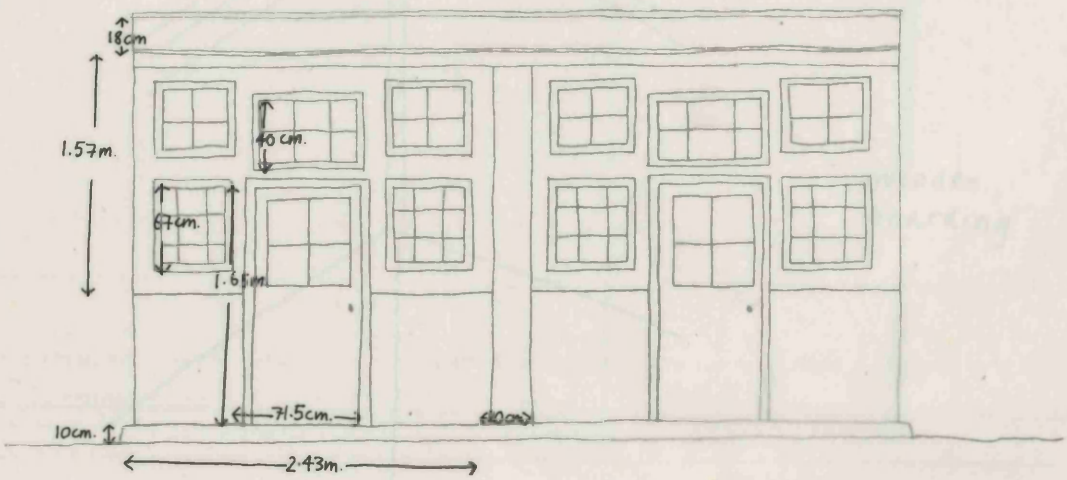
SCALE (METRES)



THE H HOUSE

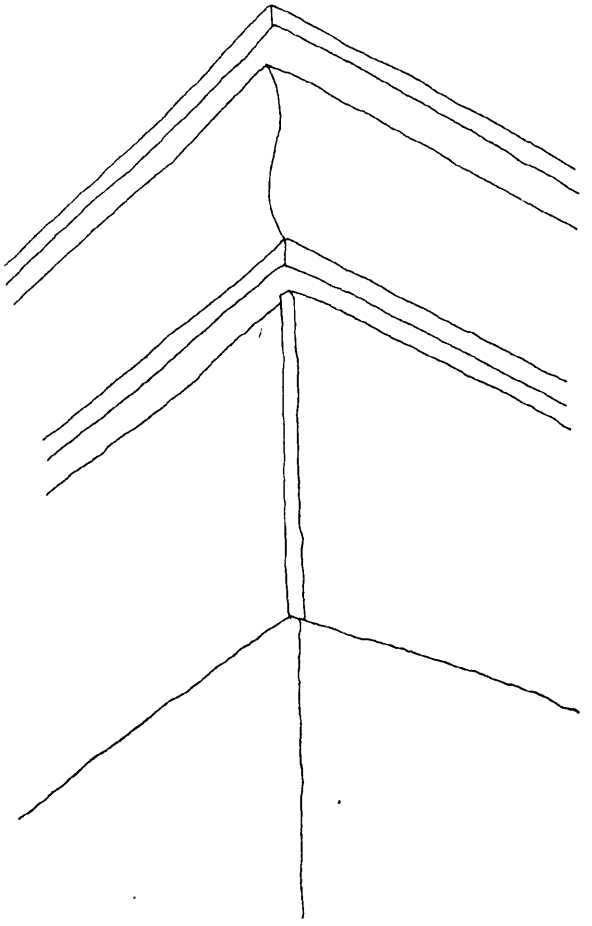
ELEVATION WEST WING

SCALE (METRES)



THE H HOUSE

Corner of roof



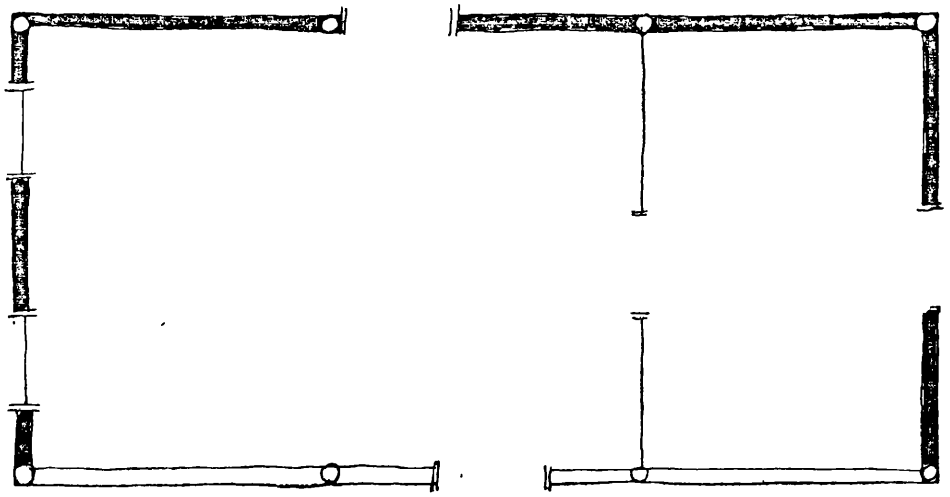
lime plaster

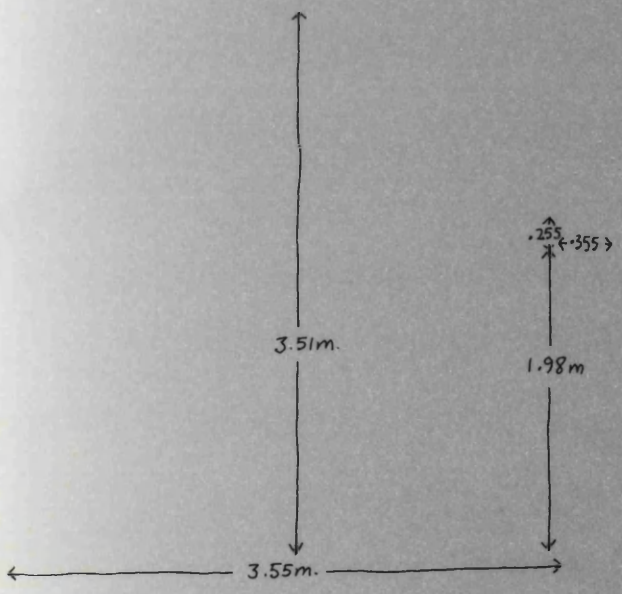
wooden
boarding

THE W HOUSE

PLAN

SCALE (METRES) → N

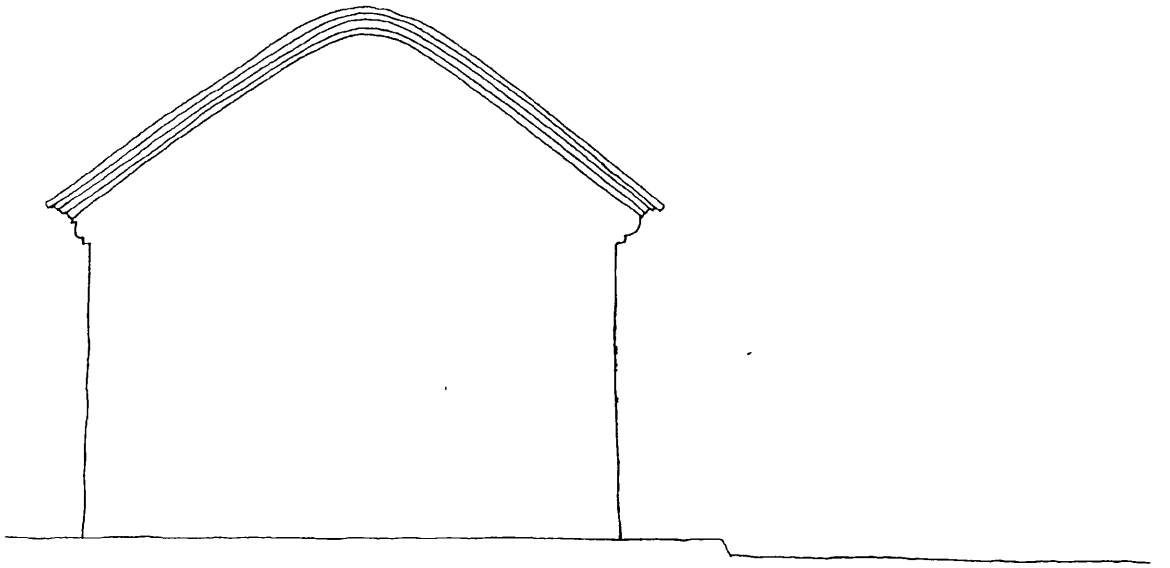



3.51m.
.255
.355
1.98m
3.55m.

THE W HOUSE

SOUTH ELEVATION

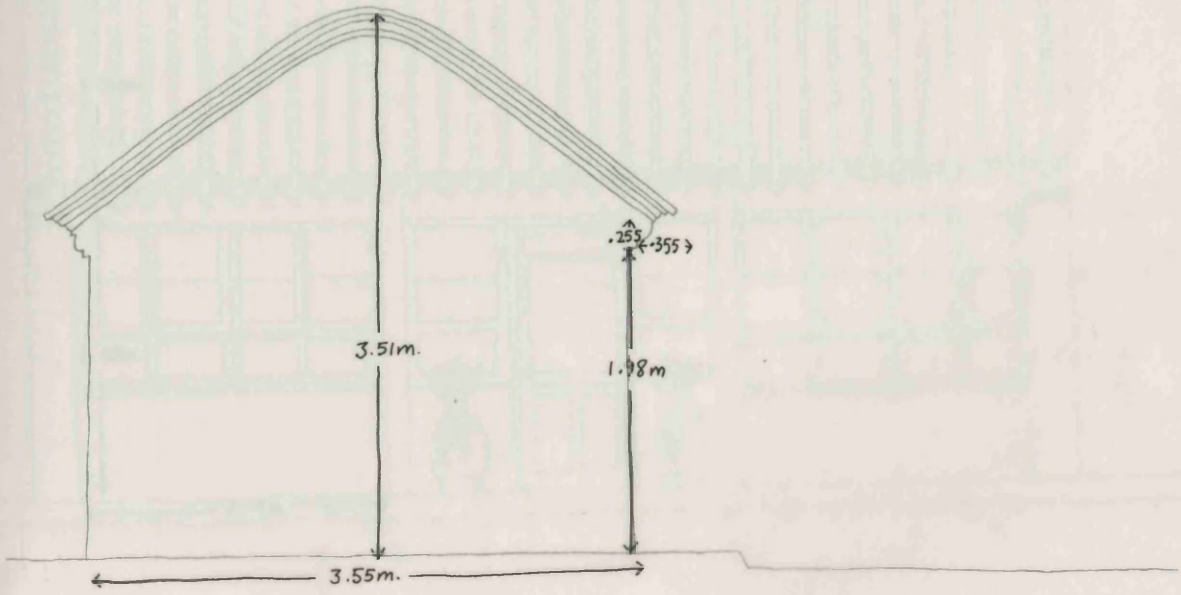
SCALE (METRES)

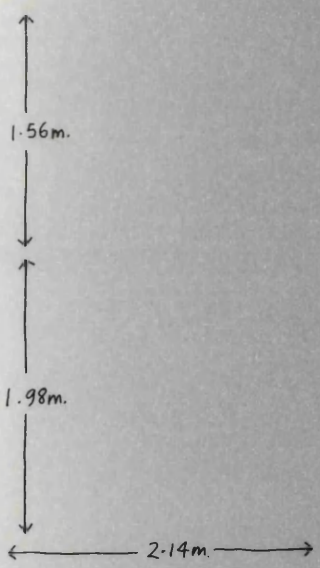


THE W HOUSE

SOUTH ELEVATION

SCALE (METRES)

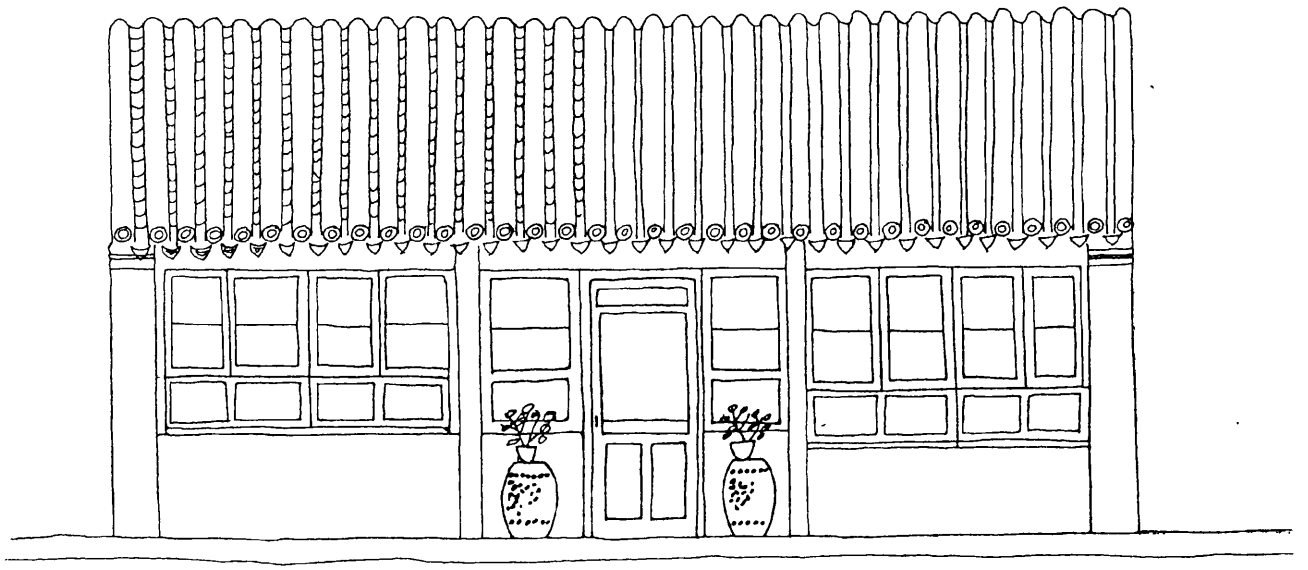



1·56m.
1·98m.
2·14m.

THE W HOUSE

FAÇADE

SCALE (METRES)



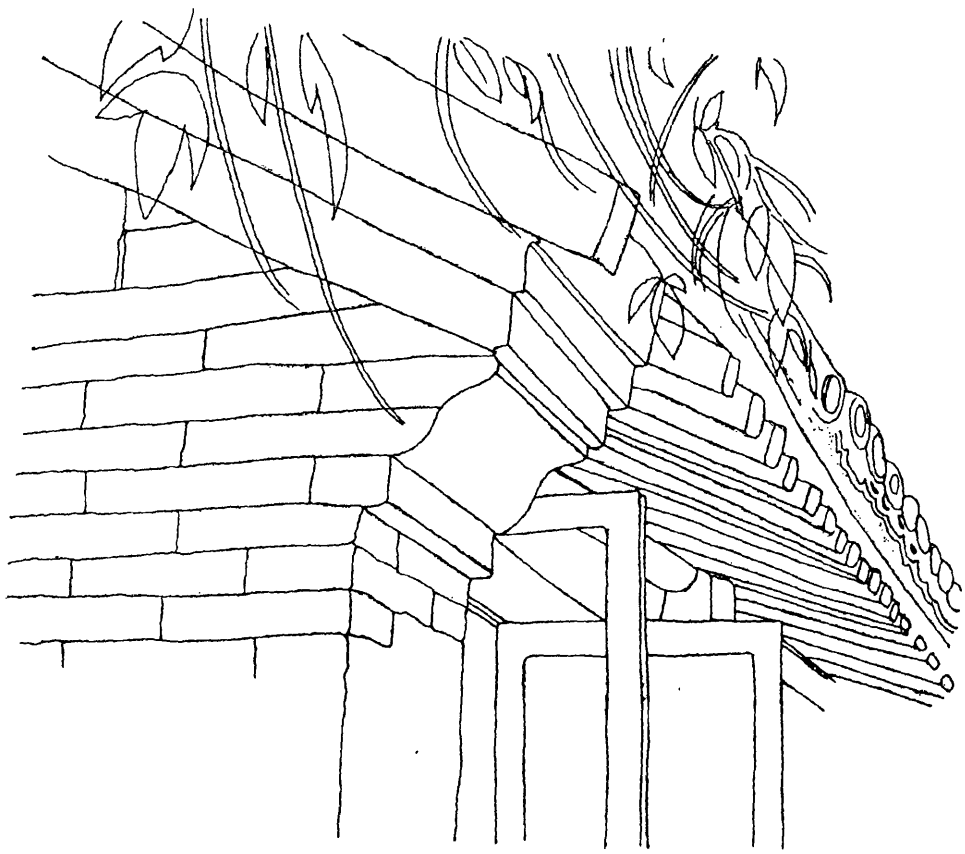
THE W HOUSE

FAÇADE

SCALE (METRES)

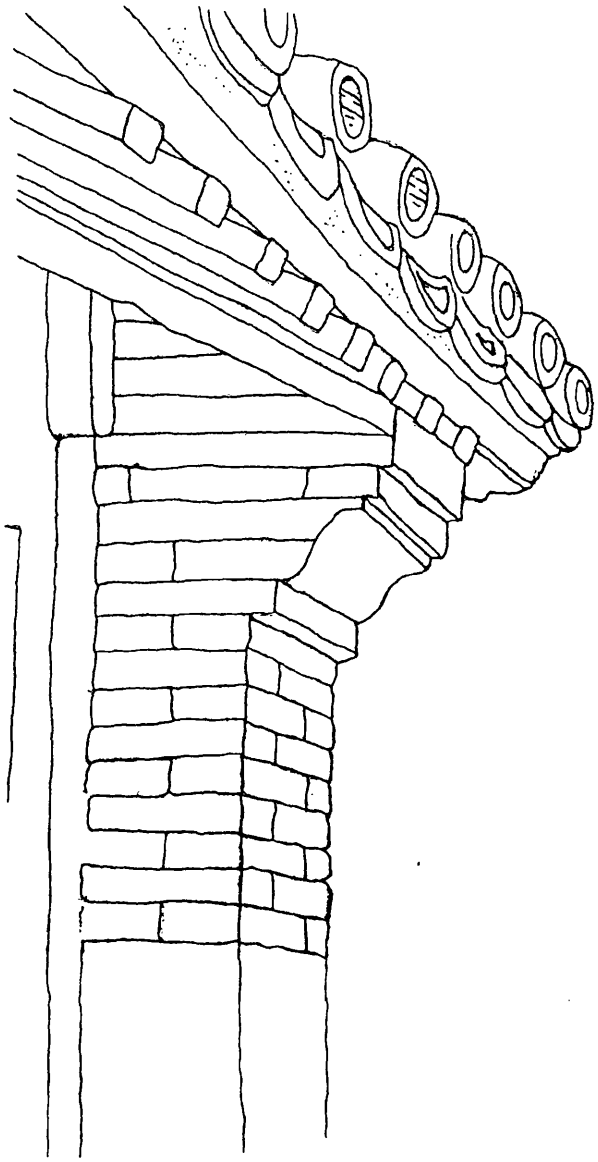
THE W HOUSE

Pilaster



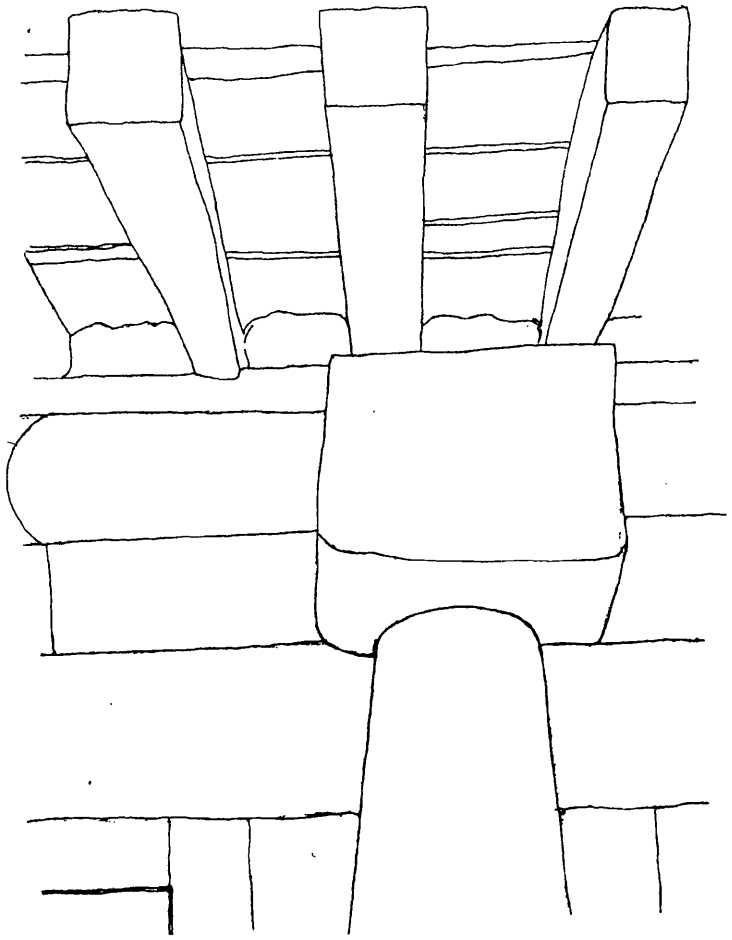
THE W HOUSE

Pilaster



THE W HOUSE

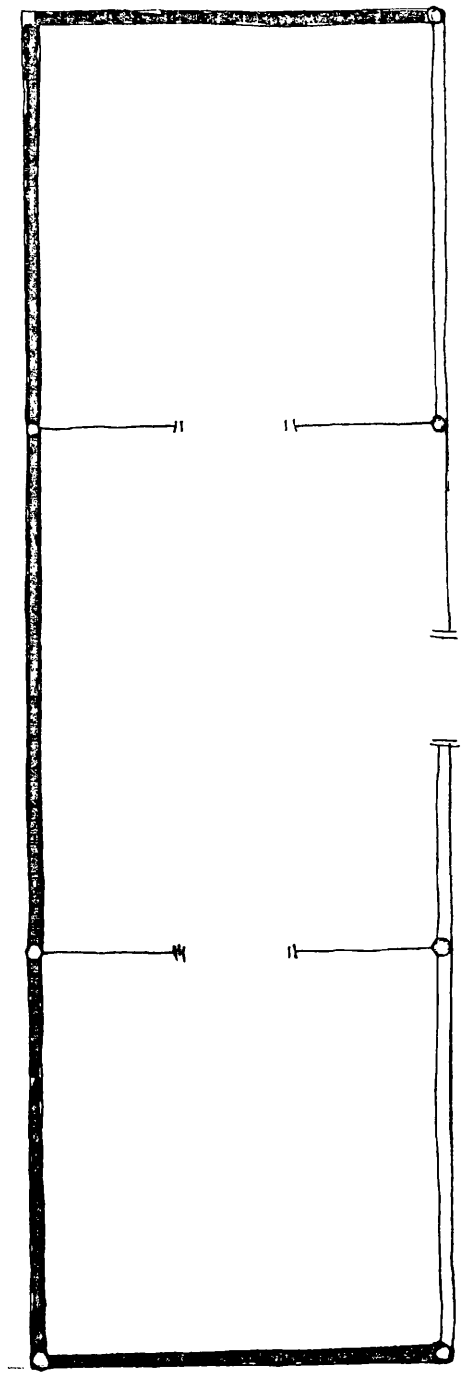
COLUMN HEAD SHOWING EAVES PURLINS AND CLAY AND BOARDING UNDER TILES.

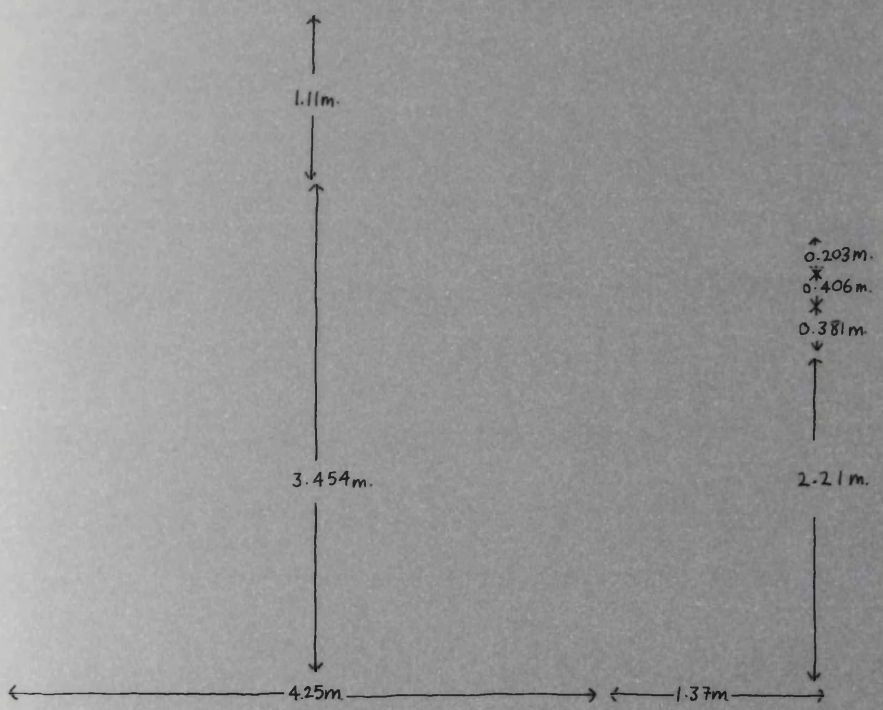


THE Z HOUSE

PLAN

SCALE (METRES)

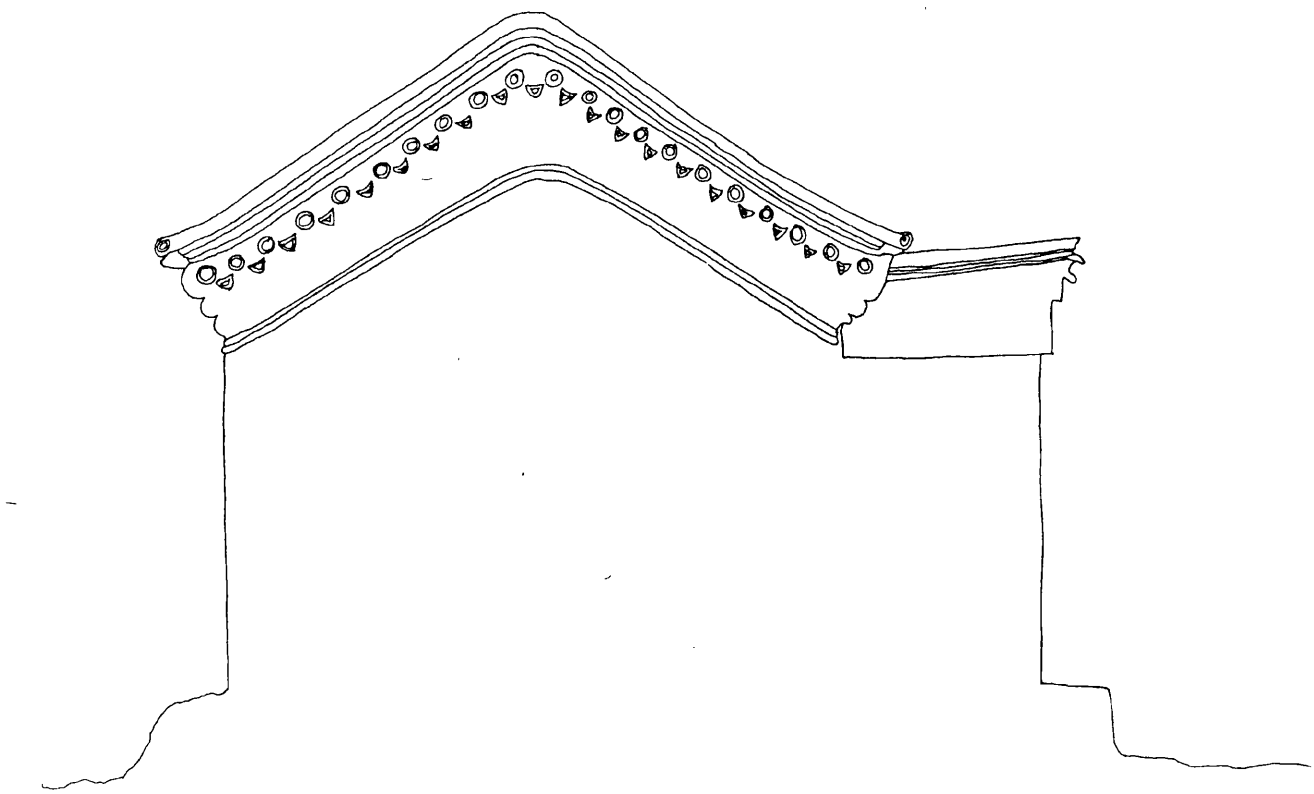



1.11m.
0.203m.
0.406m.
0.381m.
3.454m.
2.21m.
4.25m
1.37m

THE Z HOUSE

WEST ELEVATION

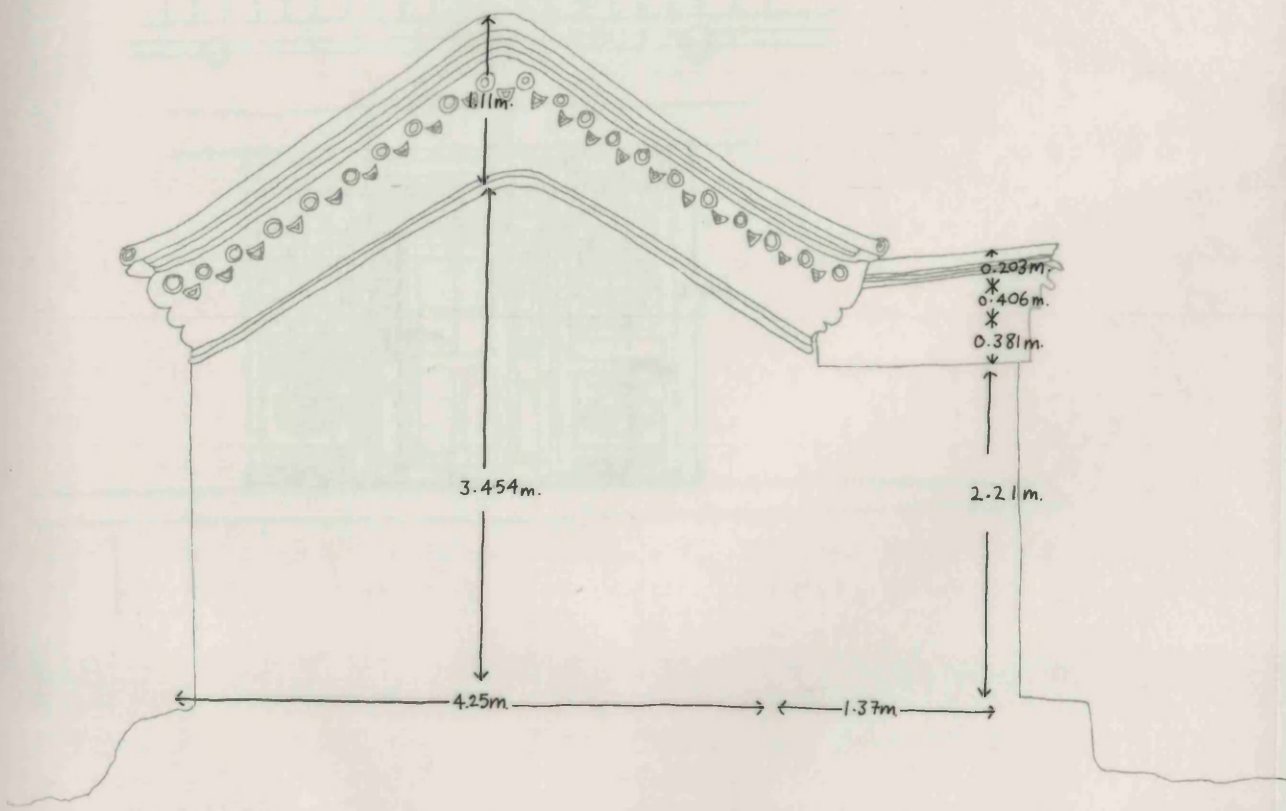
SCALE 5cms = 1 metre

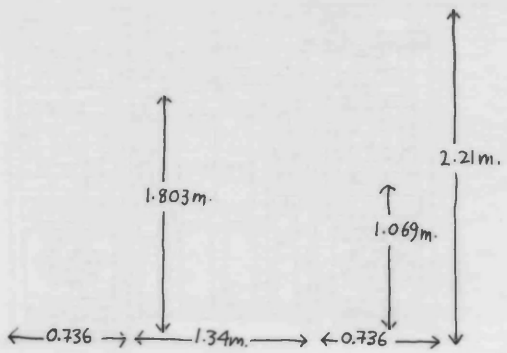


THE 2 HOUSE

WEST ELEVATION

SCALE 5 cms = 1 metre

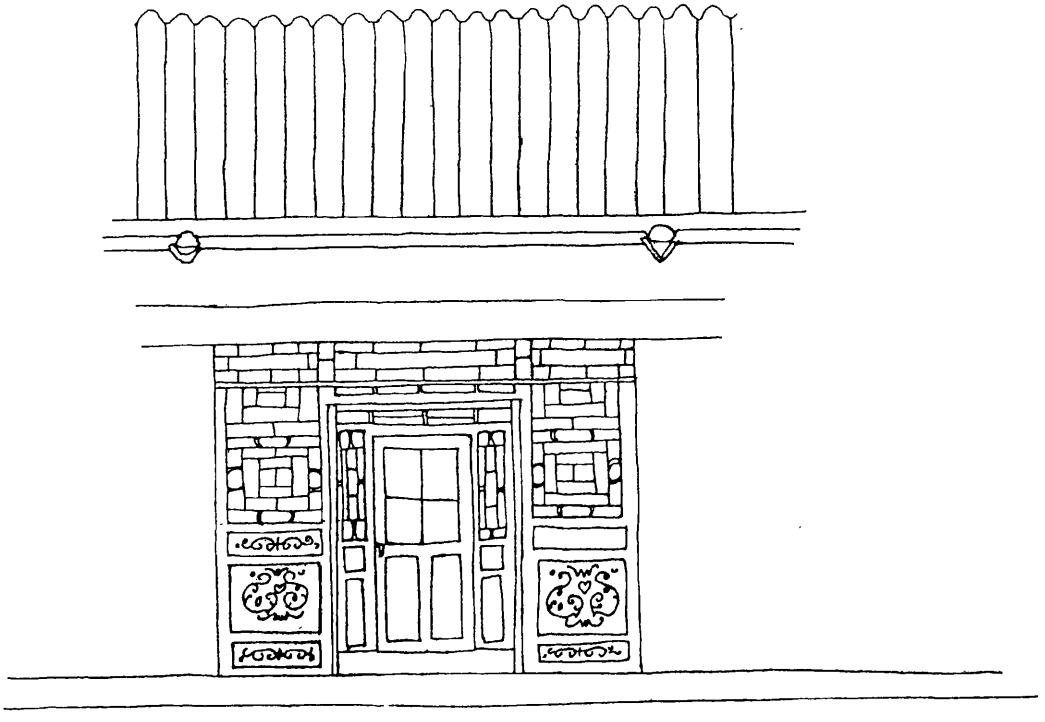



2.21m.
1.803m.
1.069m.
0.736
1.34m.
0.736

THE Z HOUSE

CARVED CENTRAL JIAN

SCALE (METRES)



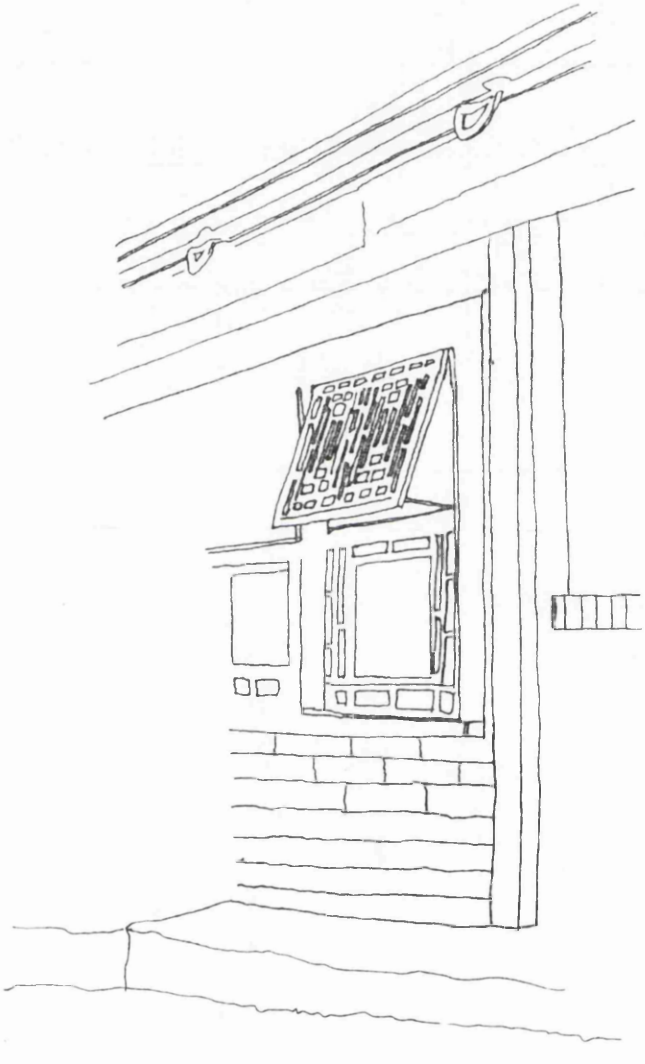
THE Z HOUSE

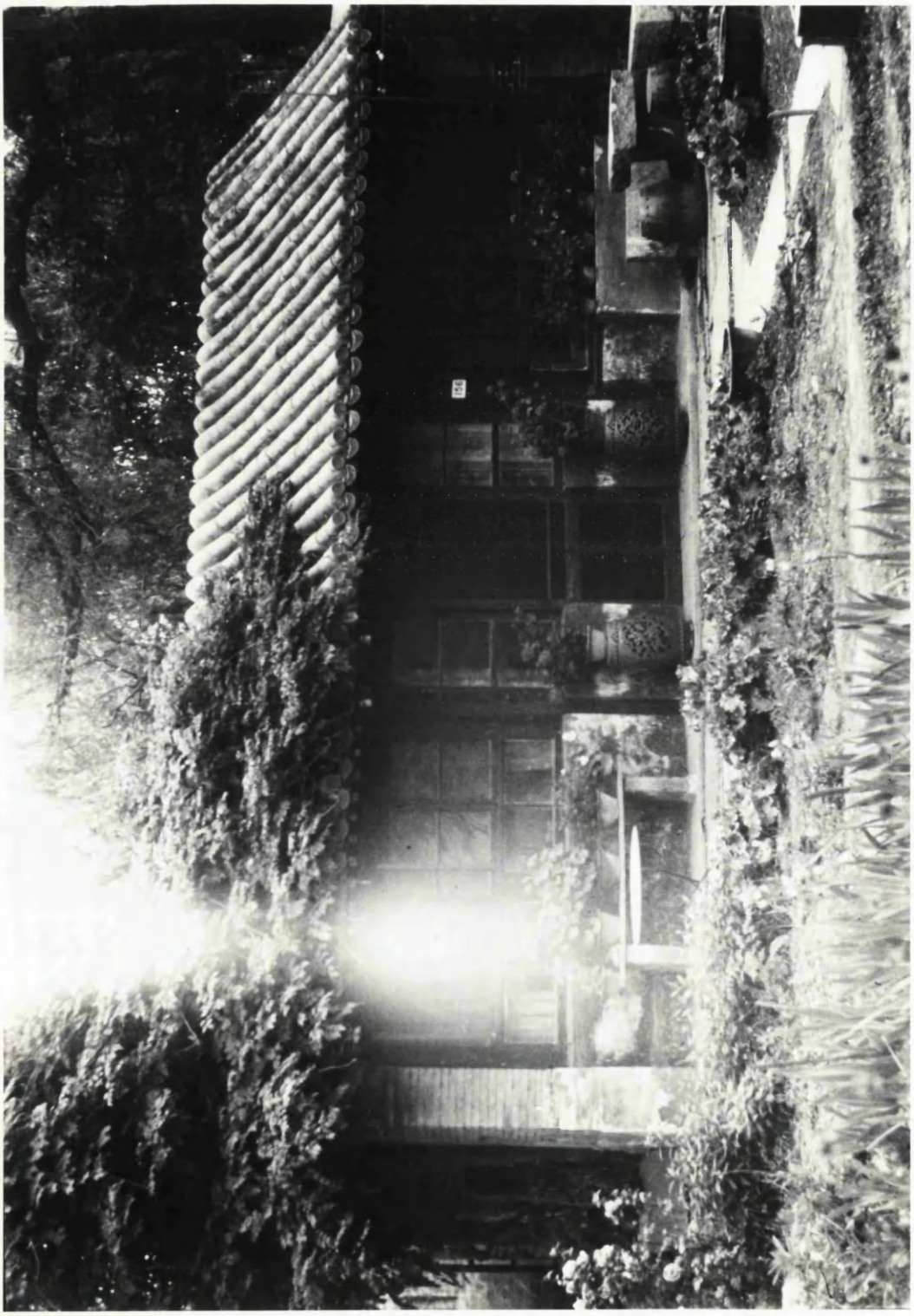
CARVED CENTRAL JIAN

SCALE (METRES)

THE Z HOUSE

OPENING OF UPPER WINDOW





The W house

Bob Winter outside the W house

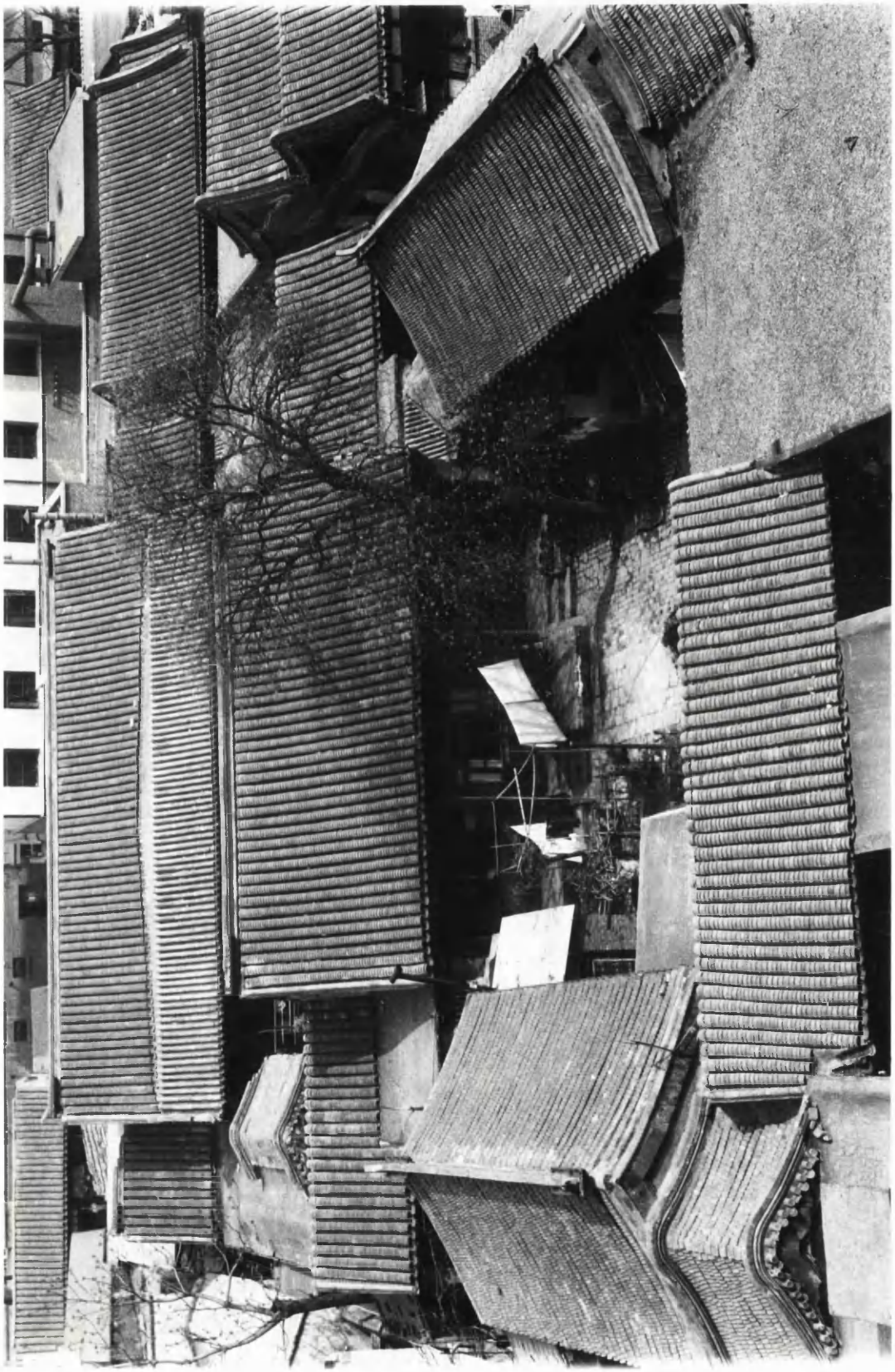
The Z house: roof detail

The Z house: carved facade

The Z house

House A

House B



House C

Chapter 3: The Construction Process

Such houses as described in the previous chapter were constructed in very similar ways.

Before construction of a new house could begin, it was necessary to acquire a plot and building materials. Though land purchase will be described as an integral part of the process of house construction, the majority of the inhabitants of Beijing lived in rented accommodation. The percentage of those owning their own house has been given as 21.2% in 1926(1) and the percentage was roughly the same in poorer villages on the outskirts of Peking,(2) though in the slightly more prosperous market town of Qinghe (清河), 50.3% of the resident families owned their own houses (though a few had pawned them).(3)

In earlier periods, a government land and rent office, the loudian wu (楼店務) had existed since much of the most lucrative land was owned by the government, but by the Qing period this was less clearly the case(4) and where there were tenants of official lands or buildings they often sub-let.(5)

The question of rent and ownership of property or land within the city is linked to a very different view of the home that existed and still exists in China. Whilst today there is little likelihood of sub-letting, it is clear that in traditional China, many people regarded their home not as a castle, not as a prticularly permanent residence, but rather as a piece of property that could be used to make more money. Thus it was widely noticed that Chinese families might rent out their own house and live in smaller, less impressive property(6) and that they seemed to move frequently.(7) Though in Chinese cities as a whole it was rare to find very distinctive rich and poor quarters (8) in Beijing certain factors such as proximity to the Imperial Palace and, from the

mid-nineteenth century, proximity to the legations meant a higher demand for accommodation so that there was a greater incentive for Chinese families to rent out their house and move to the cheaper north or west part of the city.(9) The owner of a house might not move out completely but rent out part of his property in order to live on the proceeds.(10)

Land and buildings were rented or exchanged according to distinctions of ownership which reflected ownership of agricultural land: those of pu di (铺地) or surface usufruct and ji di (基地) or substratum ownership. Thus a man might own both his house and the lot on which it was built or, owning the house he might be renting the land from the holder of the substratum rights. Whether a man was outright owner of house and land or not, as has been stated already, it was common practise to sub-let. This was done by advertisement (11) and the exchange of a written contract between owner and tenant, the tenant usually being required to pay some form of deposit, usually about three months rent in advance.(12) It must have been fairly common for tenants to lose this deposit (not a deposit in the strictest sense since the landlord or lessor could retain a proportion in consideration of 'wear and tear')(13) since many of them appear to have been unwilling to pay rent once established in the property, "acting on the principle that possession is nine-tenths of the law"(14) and the landlord, knowing that litigation would depend on graft and the subsequent goodwill of the magistrate (15) was frequently forced to acquiesce and give the tenant notice to leave. Such disputes with landlords may have been one of the reasons for the mobility of Chinese families already noted.

As far as land purchase was concerned, it seems that Peking was treated separately, in that no land tax was paid. Elsewhere a land tax was levied (16) and though the most important source of revenue from such a tax was agricultural land, the tax was also paid by urban residents

on the basis of the building lot, the buildings themselves not being taxed.(17) The reason for the absence of the tax was said to be that the city was the home of many government officials and Manchus who were supported by government pensions and that the cost of city government was borne by income received from the provinces.(18) Though it is difficult to find material relating to the sale of land within the city of Peking during the Qing,(19) there is an account of the sale of land to the British.(20) The land in question adjoined the British Legation (which was itself leased in perpetuity for an annual rent of £500 or 1500 taels) and had originally been a palace of the Duke of Liang.(21) The adjoining land was the property of a lineal descendant of the Kangxi emperor and the transaction took place on the land itself, witnessed by the owner's uncle. Also present was a money changer who checked the 3700 taels of silver (the purchase price) and, using indian ink, marked the weight of each piece on its side. The owner produced the deed of sale which he had already signed, his uncle, as witness, signed eleven characters and stamped his seal over the date. On the back of the deed a receipt was copied and sealed.(22)

After the establishment of the Republic in 1911, though the custom of not paying land tax continued in the city, a new tax was levied on the sale and mortgage of land and property.(23) On a sale, the tax amounted to 6% of the sale price. If the land was a gift or sold below market price, the valuation scale for tax purposes was estimated according to the number of rooms (jian) and according to the material from which the building was constructed: 70 dollars per jian in a brick house, 20 if the building was of terre pisé. In the case of a mortgage of land, the tax was 3% of the mortgage amount.(24)

In the case of both land tax and mortgage tax, the deeds had first to be sent to the police who accepted and forwarded a joint petition made

by buyer and seller to the Municipal Council whose approval was necessary. The Council sent an inspector to check that land and buildings were accurately described [25] and that no encroachment took place above all on public highways or public land. When ratified, the deeds were returned via the police to the purchaser who had to pay the purchase price and the tax within six months. When the tax was paid, the deed was stamped by the tax bureau. Any later changes in the existing buildings or erection of new buildings had to be registered by returning the deeds to the police for re-issue.

Under the Republic, re-building seems to have been less problematic than in the nineteenth century. After 1911, applications for alterations or erection of new buildings were usually approved by the police within a week (Monday to Monday), although if the walls were to touch any of the lot lines, the property deed had to be submitted with the application to guard against encroachments. If the deeds were in other hands (presumably pawned), a shop or store could acceptably act as guarantor. By contrast, in the nineteenth century it seems to have been illegal to rebuild within the city limits, and indeed within 40 li of the city, unless a building had actually fallen down, though repairs were permitted.[26]

According to the law of the Qing, licensed middlemen had to deal with such important transactions as those involving land and property. Each province had a quota of such men [27] and they had to apply for a government license with a guarantee from another already licensed middleman and also from neighbours. The broker's license could be withdrawn if the holder was discovered to be dishonest. [28] In Beijing, the brokers concerned with property sale and mortgage were known as "pullers of rope" and they frequented certain teahouses. Apparently professional jealousy made it difficult for them to conduct their business since they wished to keep the numbers involved in any transaction down to a minimum in order to

obtain a decent percentage. This was important because the commission was divided amongst the broker and his associates. It was known as cheng san po er (成三破二), "make three, lose two", since the buyer paid 3% (of the purchase price) and the seller 2%. If someone wanted to mortgage his property, it was possible to raise 40-60% of its value and involved handing over the deeds as security. The owner would only get 93% of the loan, 2% going to the gatekeeper of the moneylender and 5% to the middleman. The rate of interest varied from 2-4% per month.(29)

After acquiring land, it was possible to contemplate construction. In north China, houses were (and still are) built mainly in spring or autumn (30) and repairs are carried out at the same times since rain rarely falls during these seasons. Winter is not a suitable time for building anything involving pise construction since the ground is too hard to be easily worked and there is also the danger of water in the earth freezing.(31)

In the countryside around Beijing and elsewhere in Hebei province (as in the rest of China (32)), it was usual for the owner of the land and prospective house-owner to buy the necessary materials himself. In some cases, he might entrust the work to a master mason or carpenter but there was always the danger that the craftsman might buy inferior materials, pocketing the difference. (33) It was common practice if possible to buy the materials, especially wood, sometime in advance so that it would be dry when required. Apart from wood, the proprietor had to provide stones, bricks and tiles. Outside Beijing, the bricks were made from earth with some straw incorporated, moulded in frames and then set in the sun to dry. (34) Inside the city, the bricks used were fired, not to a very high temperature and were invariably grey in colour. (35)

After the materials had been acquired, it was necessary to hire a foreman or overseer to organise the work. In the countryside, it seems that two men were in charge, a master-mason and a master carpenter, each of whom had responsibility over labourers within his technical sphere. In the city, by contrast, where buildings might be rather bigger in scale, it seems to have been quite common to have a single overseer, responsible for all the craftsmen and labourers involved on site. (36) With the foreman or foremen, the method of work was settled. There were two systems of organisation and payment, the first, da bao gong (大包工) involved a set term for the work and the payment of a fixed sum which apparently led to dangers of skimping both on materials and in care, the foremen preferring to get the job finished so that they could get on to another job and also save money on nails by not using enough in, for example, the roof framework or by replacing good wood with bad. (37) The alternative was the xiao bao gong (小包工) system or day rate. This seems to have been most commonly used in Beijing. (38) A typical contract of the xiao bao gong type was translated by the Père Seghers: "Today the negotiators of the enterprise in question have decided that they will commence the construction of a seven room house consisting of a central building and east and west wings. We declare that according to the day rate system (payment according to the hours worked), each workman will receive daily a ligature and 700 cash; that the workmen will use the proprietor's salt, vegetables, mustard and whatever else they require; that they will receive three main meals (per day) of meat, flour and spirits. Each man will be entitled to a grand dinner, two ligatures for ordinary meals and an extra ligature for expenses. This is what the contracting parties have decided and, not wishing to renege on any of these points, they have made out this contract to serve as evidence, fearing that a verbal agreement would be insufficient."(40)

In principal, this agreement, though not involving Beijing craftsmen who would be guild members, is not different from the stipulation of the carpenters guild, made some twelve years later and only affecting carpenters in Beijing which was that carpenters should receive a fixed wage of 0.75 dollars (Chinese) per day of which 0.20 dollars was for food so that if food was provided, the take-home pay would be 0.55 dollars. (41)

The contract was made between the proprietor and the foreman so that the actual payment of the labourers might be considerably less than stipulated. (42) In the nineteenth century, too, it had been the practise to offer the foreman a sum of money for a fixed number of labourers which he could use, taking the guild regulations of minimum wage into account, as he pleased. Workers had little recourse if the wages offered fell within the minimum stipulation since there were always others looking for a job. (43)

The average working day on a building site varied slightly, according to the weather and the type of work but in general, it was a long one, dawn to dusk, the workers receiving most, if not all of their meals on site, provided by the contractor. In the case of work on a large project, it was not unknown for the workers to sleep on site, (44) breakfast and smoke a pipe and start work at half-past seven. They worked till twelve when they "devote an hour to eating and smoking" (45) and then they resumed work until half-past five when they ate an evening meal and either slept where they were or went home for the night. (46)

In the mid-nineteenth century, the workmen renovating and rebuilding the British Legation did not enjoy the extra meals at set points that were a feature of house building, such as a special dinner when the foundations were completed, (47) nor did they regularly receive meat three times a day as stipulated in the quoted contract. Their

three meals consisted of rice, tea and vegetables 'ad libitum' (48) (thus they also lacked the spirits that were written into the quoted contract), and they were also entitled to a pork dinner once every fourteen days, when bread was substituted for the daily rice. As described in the Guild regulations, the contractor deducted three pence from each man's wages per day in order to provide this food. (49) Though the contractor supplied the necessaries, it was common for workmen on long projects to group themselves into "messes" and "according to their means, introduce little luxuries." (50)

At the main meal time, the workers had quite a considerable rest period. Since this was at midday, in the summer they slept to avoid the heat, (51) but when the weather was cooler, they would pass the time perhaps by playing dominoes with bamboo pieces. (52)

It was not usual for workmen to have any holidays apart from the slack seasons of winter and summer, but they seem to have been particularly firm on the question of rain and though they would not have been paid if they stayed off because of rain, they did not work in rain and this was accepted by the foreman without dismissal because the materials, particularly wood, were not in a state to be worked after exposure to the rain. The workmen themselves stated that they did not like rain because it gave them rheumatism and ruined their clothes. (53)

On a large site, some control was necessary to ensure that each workman worked a full day to earn his pay. This was affected by handing each man a small "wooden ticket" in the evening when he left. This served as his credential for entry in the morning and would be checked each evening to ensure that he had been at work. (54)

Very basic conditions of employment, mainly concerned with pay were laid down by the carpenter's guild, known as the 'Sacred Society of Lu Ban'(55) which operated a closed shop in the Beijing area.

In the early 1920s the members were uncertain of the history of the guild, only stating that it had been re-organised during the reign of the Xian Feng emperor (1851-2).[56] Guild membership was extended to house-builders, coffin-makers and carvers of wooden ornaments but furniture-makers were excluded, having a guild of their own.[57] It was usual for carpenters working on a house to work in co-operation with members of other guilds such as tile-workers, masons and painters (of wood) and the paper-workers who, apart from making paper furniture for funerals, also hung wallpaper on the inside walls of finished houses.

The aim of the guild was, according to a member interviewed in 1928,[58] "protection from officials", "discouraging of competition" and, perhaps most important of all, "standardization of wages" and "religious worship." The main feature of the religious side of guild work was the annual meeting at which organizational matters were also decided but where, the meeting being held in one of two temples in Beijing, religious plays were performed and Lu Ban worshipped.[59] It was at such meetings that apprentices who had served their training period of three years and three months could join by paying a fee,[60] kowtowing three times and burning incense to the image of Lu Ban, thus obtaining a permit to work in one of the six areas recognized by the guild in Peking.[61] The carpenter would then be eligible for the standard minimum wage and would have his funeral expenses paid.[62]

It seems certain that guild membership did "unify" carpenters,[63] for during the mid-nineteenth century, the workmen on the British Legation site struck twice in a year over pay, once over the type of money in which they were paid and once for a straightforward increase. "At present they receive 10 pence per diem from which the contractor deducts three pence for their food. Their demands now are 10 pence a day and 'chow chow' ... in fact ... an increase of 5 pence per diem."

On another occasion they requested double wages "to overcome religious scruples" when working on the eve of the Dragon Feast. (64)

Once pay and conditions of work had been settled, the workers arrived at the construction site, the carpenters bringing their planes, chisels, saws and hammers, the masons their rule, trowels, mortar-trough and small bags for moving lime. (65) Rope, buckets and anything else required were supplied by the proprietor.

Before the erection of walls or framework, a variety of preparatory tasks had to be undertaken. (66) It is clear that, given the elementary division of labour (stonemasons, tile-workers and carpenters), on all except the simplest constructions, there were likely to be some workmen preparing wood whilst others perhaps smoothed bricks or levelled the foundations. In the Peking area there were two principle types of house, one with a wooden frame and infill walls and another (which might be thought of as a rural version but which exists in the enlarged area which is Peking today) where the roof framework rests on the top of brick or pisé walls. In these two types, the foundations were treated slightly differently. In the former type, very little was done to the ground, apart from levelling it. This was done by stretching a string between posts in order to provide a guide. (67) Though the bases of pillars are hidden within brickwork, it seems likely that even in simple houses, in order to protect them from rising damp, they were set on flat stones (68) perhaps with a slight depression in the centre. If the walls were to be of brick (69) or pisé, it was necessary to provide a proper foundation by digging a trench some 80 cms wide and between 40 cms and 1 m. deep according to conditions, deeper if the ground was likely to become water-logged. (70) This trench was then filled with a layer of pebbles and then earth, pounded with a rammer held by two men. When the earth filling reached 10 cms below ground level, it was covered with stones,

the interstices filled with chalk or lime. (71) According to the contract quoted by Seghers, when the foundations were finished, a special meal was provided for the workmen. (72)

When the foundations were prepared, it was also customary to lay coins under the spot where the door would be and at the four corners of the floor (73) to bring good luck to the inhabitants. Other superstitious practices included engraving the characters for Mount Tai (泰山) on the first stone laid in the building. (74) The stone obviously stood as a challenge and threat to evil spirits since Mount Tai is one of the holy mountains and the full phrase engraved reads 'the Tai shan stone dares to stand.' The last section of the Lu Ban Jing consists entirely of building magic, including lists of dangerous practices and actions like the placing of the Tai shan stone which will protect the owner of a house. It seems clear that building superstitions varied in the different regions of China but the balance in the Lu Ban Jing allows for the owner of a house to protect himself and his family and attempt to insure against the future, perhaps creating a dynasty of officials by walling up a cinnamon leaf and also allows the carpenters to hold some sway over their employer since there are quite a few actions that will bring disgrace on the family such as walling up a fragment of clay and a piece of a broken saw which will cause the death of the husband, re-marriage of the wife and the dispersal of the family. Thus it was important to treat workmen well to avoid their bringing misfortune on the family. There is also a section which may be called a 'physiognomy' of the house, listing good and bad siting of houses, gates, paths and so on. (75)

In the typical house, the wooden frame was set up on the pillar bases, columns first. In general, the number of columns determined the number of rooms, (76) though the internal dividing walls, not load-bearing

but rather screen walls, could be dispensed with in some parts of the house to create larger rooms. Above the columns that supported it, the roof structure consisted of tie-beams, cross-beams, posts to support the purlins, the purlins themselves; the arrangement of posts and purlins determining the profile of the roof. The types of roof profile encountered in Peking and its environs range from the virtually flat (not entirely flat since there is a slight slope towards the facade to facilitate drainage) (77) through varying degrees of pitch with drainage to both sides. (78)

In the rural areas, timbers used in house construction were hardly trimmed at all (79) but it can be observed that in more expensive constructions, the visible timbers at any rate were much more carefully finished. The type of wood used depended a great deal upon the budget and locally available material. Ideally, a hardwood would be used but this was so expensive that soft woods were far more widespread. (80)

In preparing the wood on site, first the tree trunks were trimmed with a hatchet which the carpenter swung towards himself as he stood on the wood itself (81) or perhaps set between two three-legged wooden supports as is shown in the first part of the Lu Ban Jing. (82) Smaller pieces of wood were held upright and trimmed with an axe. (83) Bark was removed with a drawing knife, (84) a two-handled tool with a metal blade slightly convex in profile that was pulled towards the body. When the wood had been thus trimmed, it might be measured and marked. Some of the line-marking equipment of the Chinese carpenter has excited a certain amount of interest. (85) The line-marker was a home-made tool consisting of an inkwell through which hemp string was drawn, picking up the ink, and a handle to wind the string back after use. The string was wound out along the board, held tight and picked up gently. When it fell back on the board, it left the line desired. (86)

Another instrument is the bamboo brush used to mark lines that are uneven, as for example when a board needs to be fitted to an uneven wall. To draw such lines, the Chinese carpenter used a bamboo brush whose bristles were divided into two parts and held apart by a peg. Thus one side followed the uneven line required to be cut and the other side, loaded with ink would draw it out, perhaps a quarter of an inch away. (87) It was usual for a carpenter to use ink-soaked rags in an inkwell, rather than grinding ink when required. (88)

When the wood was marked, it was set in a three-legged 'horse', if planks were to be sawed from a trunk, one horse was used which held the wood at an angle of about 45 degrees from the ground. For cross-sawing and other work, a smaller 'horse' (a pair of pieces of wood, crossed, with a third piece to hold them upright) or two might be used. (89) The usual saw in China was a two-man affair, perhaps five feet long and consisting of a frame, holding a peculiar blade in which the teeth ran from one end to the middle pointing in one direction and from the middle to the other end, they pointed in the opposite direction, thus both men had to work equally hard. (90) In smaller handsaws (91) the teeth all pointed in one direction and the saw worked on the pull.

The Chinese plane was used away from the body and was not particularly different from those used in the West except that it frequently had two handles, one on either side to facilitate work. (92) Other carpenter's tools, brought to site in a wicker basket which is seen in every illustration of carpentry in the first section of the Lu Ban Jing, include the chisel, made of metal, ideally steel, with a wooden stock inserted into a conical socket, the waist clearly defined (93) and various other tools which were used to drill or make holes for dowels and mortice and tenon joints, both of which were far more common than the use of iron nails. Even in the nineteenth and early twentieth century

when nails were available, they were still expensive, which is why Seghers warned that a common way to skimp in construction was by not using enough nails in the roof framework. (94) The Chinese carpenter used a bow drill made of hard wood with string and a metal bit (95) and other tools such as a reamer (a wooden handle with a long tapering metal spike, square in cross-section) for making holes. (96)

The pillars were the first parts of the framework to be erected standing on their stone bases (97) and whilst on the outskirts of Beijing it is still possible to see simple house construction proceeding with the gradual composition of the roof, from bottom to top, it is clear that in other cases, some parts of the roof were assembled on the ground, morticed together and erected by means of ropes.(98) Sometimes, whole sides of the framework were assembled flat on the ground and then slowly raised into place.(99) The roof timbers might be covered with wooden boards to form a firm foundation for the roof tiles or thin strips of wood might be covered with matting in a cheaper version.(100) As has been noted earlier, the profile of the roof depends upon the arrangement of the posts supporting the purlins; for a roof that is only to drain to one side, (101) the tallest post will be at the top of the slope and the posts descend, getting smaller. For two-way drainage, the central post is the tallest. The roof covering varies according to temperature and budget. (102) On top of the planks or wicker mats, a layer of gaoliang or reed stalks was laid and the thickness of this layer depended upon climate. (103) On top of this a layer of mud of some sort was laid and this varied somewhat, according to weather and to whether or not tiles were to be laid on top. If there were to be no tiles (not an uncommon occurrence in the poorer houses in the Beijing area), the top layer might contain, in Beijing, mud mixed with hemp, topped with a greyish lime. In some parts of Hebei coal dust was mixed

into the mud and straw layer and this was said to be particularly waterproof. Calcium carbonate had the same effect. To facilitate drainage, a brick or tile-lined channel was commonly laid into the mud layer, usually finished with a drain tile (one which has a protruding lip that projects the water out and away from the wall). In the Peking area these may be discreetly grey and undecorated or else may be yellow, blue or green, providing a spot of colour in an otherwise grey facade as in Haidian on the outskirts of the city. (104) Alternatively, long tiles may be laid under the mud layer at the eaves to drain the water out beyond the house wall. (105) If tiles are laid on the roof, they are laid on a thin layer of mud. They are laid in alternate rows, first with the convex side downwards, then the next row is laid the other way up, overlapping. The eaves ends are commonly, though not invariably, finished off with a circular end tile at the end of the imbrex alternating with a triangular drainage tile at the end of the tegulae. (106)

The manufacture of tiles in central and south China has been described.(107) The clay was prepared by treading it and mixing it with water. The tiles were made around a mould which stood on a slow-turning potters wheel. The mould consisted of many wooden staves hinged together with strips of cloth. The mould, which was rather like the top of a roll-top desk, was held in a cylindrical shape by means of bamboo strips inside. Four strips of bamboo were tied to the outside at regular intervals. When a strip of clay was cut, it was wrapped around the mould and smoothed on the wheel to obliterate the join. The mould could easily be removed from inside the clay cylinder by removing its supports and the clay cylinder would be left to dry for a day. Then, using the four vertical grooves left by the four strips

of bamboo, the cylinder was carefully broken into four parts and fired in a reducing atmosphere. (108) This type of flattish tile was used in Beijing as the tegula and sometimes, though not invariably, as the imbrex. In the houses where the tegula and imbrex were both similar in profile, the imbrex was raised on quite a thick couch of clay-concrete (109) whereas in the equally common roof tile type where the imbrex was significantly different from the tegula, semi-circular in profile rather than flattish, the thicker couch of clay was not used. (110)

The roof ridge was treated in two different ways in Beijing and this affected the rest of the roof, in decorative terms. The ridge was either undecorated, in which case the tiles at the roof ridge point were shaped like inverted Vs and ran over from one side to the other as in the W and Z houses, (111) or else built up with up-turned 'owls-tails' at either end (though lacking the elaborate decoration that may be seen on the ridges of the Forbidden City and on less important buildings in South China.) (112) In the former type, though the ridge was not decorated, it was not uncommon to find a built-up line along the gable.

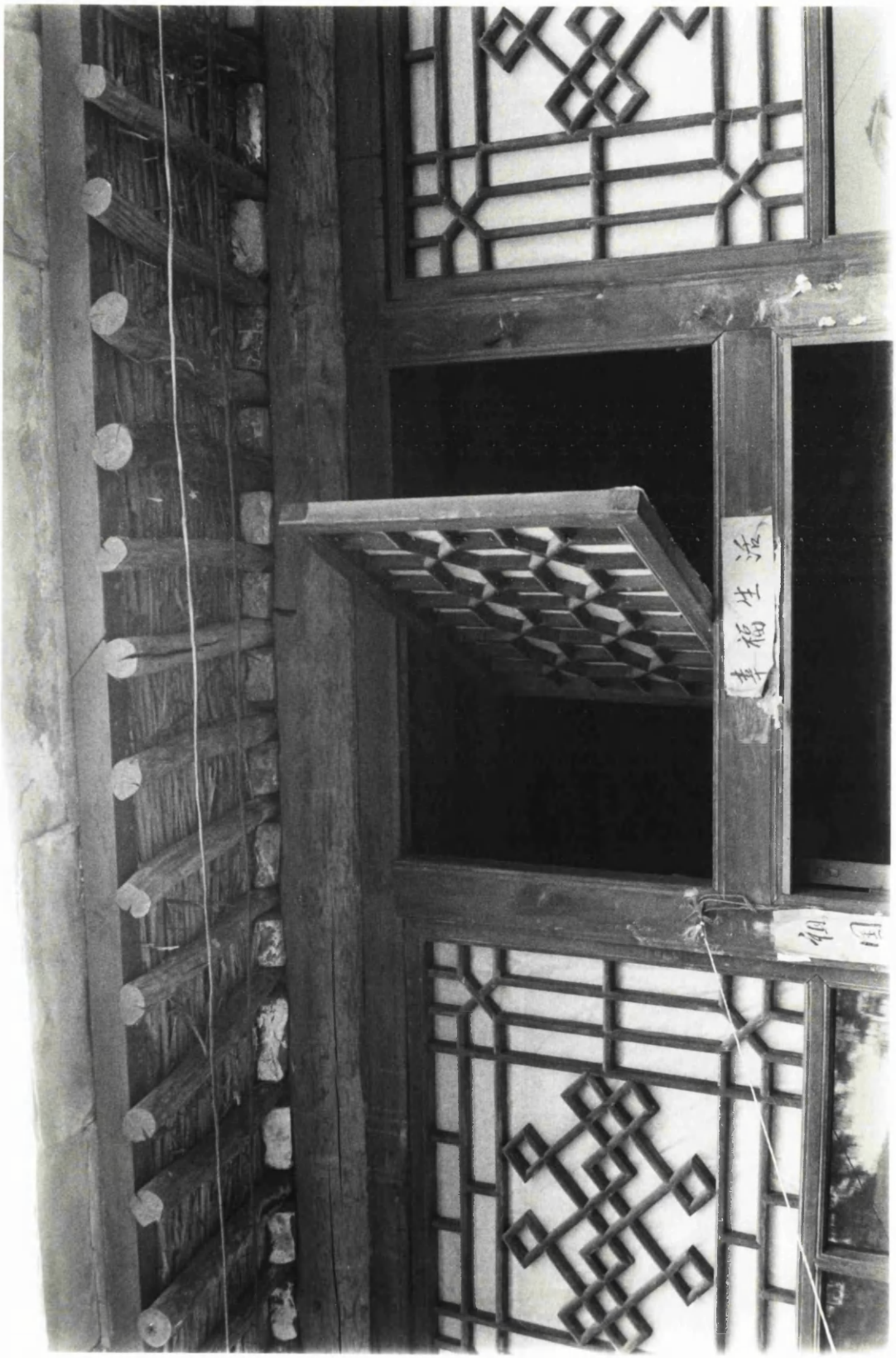
This form is seen in the Z house where imbrex and tegula with terminal circular end tiles of triangular drainage tiles were set along the gable, at right angles to the main roof tiles. (113)

The walls were usually built around the wooden framework before the roof was finished. Though in the countryside around Beijing, it was common to see a mixture of stone and brick used in the walls within the city itself, brick was most commonly used. (114)

The bricks used in construction in Beijing were generally grey, the colour being due to the practice of throwing water into the kiln after firing had fin ished but before the kiln was opened. (115) The clay was local, mixed with a little straw to bind the material and after the

bricks had been formed either very roughly by shaping with a shovel (116) or in a frame (117) they were dried in the sun before firing in a closed kiln. The bricks were finished off on site, being 'planed' smooth by the masons, in much the same way that carpenters had to trim and finish their timber. (118)

In many cases, it is difficult to determine the type of bond used since the brickwork is often plastered over and painted grey, concealing the structure, but the Flemish bond seemed most common in Beijing. The bricks used were flatter and longer than standard British bricks. (119) In the normal house, brick walls were built around the frame to the eaves on all sides except the facade where the bricks extended from the ground only to waist height, the rest of the façade being filled with the door and the windows, which may be divided into two parts, upper and lower. The lower part consisted of rather plainer lattice and, when glass became more common in Beijing, possibly in the mid-nineteenth century, it was not uncommon to have at least a portion of the window glassed, whilst the rest was papered in the traditional style. Window-paper was torn out in summer to increase ventilation; the disadvantages of glass (which is less insulating than paper and cannot be removed in summer) were not at first apparent. (120) Alternatives to glass were known in Beijing where in the imperial palace Rennie observed, "a transparent preparation of horn that is employed for making lanterns is the palatial substitute for glass," (121) but were more common in other parts of China where, in coastal regions like the Shanghai area, sea-shells were used in lattice windows. (122) The upper part of the lattice windows bore the main decoration, the window not being divided into transparent and non-transparent areas but treated as a decorative whole. This part was often hinged (either at the top or at the middle of each side) and could be opened for ventilation in summer. (123) If necessary, the wooden parts could be entirely removed and represented a permanent investment for the family. (124)



Windows, Zhoukoudian Commune, Southwest Beijing (May 1983)

The decorative window lattices were made on site, towards the end of the building process, when the doors were in position, the roof and walls already finished. The boards used for the lattice were cut and planed and then cut to the sizes required according to the working drawing (125) which, in Sichuan at least was made on a piece of board which was planed clean between each drawing. The parts were joined by mortise and tenon joints and glued as well, held in clamps and left to dry. After a day, the whole was sandpapered with a scouring rush (equisetum). (126) Each window was made separately and separately fitted into the frame. (127)

The hinges used to attach the top part of the window where it was to be opened were the same as those used in 'internal doors'. 'Internal' is used to refer both to the outer door on a house and any that might have existed within the building. A distinction must be made between this category and that of the outside door that opened onto the street since this was hinged and constructed in a more massive way.(128) Internal doors were not meant to protect except against the cold and to assure a degree of privacy so they were not very heavily constructed, frequently mortised together. (129) The hinges were simple, consisting of a wedge-shaped spike with a small spike projecting at 90 degrees to the longer spike. The other part consisted of another wedge-shaped spike with a ring head which fitted over the projection on the head of the other spike. (130) This was sufficient for windows but in doors might be strengthened by the addition of a vertical bar or pin, inserted through a ring above the hinge and then into the top of the hinge itself. (131) This bar may be removed and the door thus released from the frame as was common in China. (132) It was rare to find much padlocking or methods of securing doors in Chinese houses. The outside door was fairly firmly secured against the outside world

and within the house it was common to padlock chests containing valuables. (133)

Finally, the woodwork was painted. It seems likely that the primary aim of such painting was protection of the exposed wood but the paint was usually coloured red (134) and so added to the decoration of the house. The painter did not use a brush but a handful of rags to apply the oil paint. (135) First the wood was coated with tong oil (桐油), (136) then five coatings of lime wash were applied, these then covered with a mixture of 'hemp stuff, brick-dust and raw Tung oil,' (137) the whole finished with a coating of vermilion oil paint. It was common to paint the window lattices, the door or doors and any exposed woodwork (in other words, the whole of the facade from waist level plus doors and what parts of columns remained exposed below the window level). Inside the house, the exposed wood might be oiled.

In simple houses, it was common to leave the roof structure visible, consisting as it did in the main of cross-beams and posts. In some cases, a false ceiling of boards might be added or more commonly, rush matting. (138) The walls were plastered or papered. (139)

A design feature that is particularly striking in Beijing and can be considered as part of the applied design though it must have been affixed earlier in the construction, is the use of cut bricks. These are usually found on either side of an entrance gate, (140) perhaps along a roof where this is marked by a raised ridge (141) or just under the eaves at the top of the wall on either end of the house. The two end walls usually project about a foot beyond the facade, forming two pilasters (presumably to add support to the eaves and to protect the facade from the weather) and in houses or shops where there was no courtyard, where the facade faces the street, it was not uncommon to find decorative brickwork at the top of these two pilasters. (142)

Ceiling, Zhoukoudian Commune (May 1983)

Chimney, Zhoukoudian Commune, Southwest Beijing (May 1983)

The cut brick is always grey and must have been mould-made in many, though not all, cases. Over entrance gates, the design is sometimes extremely complex and must have been made to order but on pilasters, whether of an entrance to a courtyard or on the facade itself, the designs are restricted, a particular favourite in Beijing being the hanging basket of flowers. (143) On either side of the pilaster, again right at the top, there were often cut brick designs featuring the protective swastika, or the mystic knot. (144)

Chapter 4: Development of the Main Features of the Courtyard House

When instructing a builder to construct a house, the owner needed only to tell the builder how many jian were required for both knew what a house should be. It was not even necessary to specify the arrangement of jian for both assumed that the house would be in the form of an enclosed courtyard. The single Beijing courtyard (of the houses behind the Peace Hotel) represents the simplest version of the northern courtyard but still shows the same features of enclosure, structural reliance on timber, balance and consistent orientation found in courtyard houses all over China.

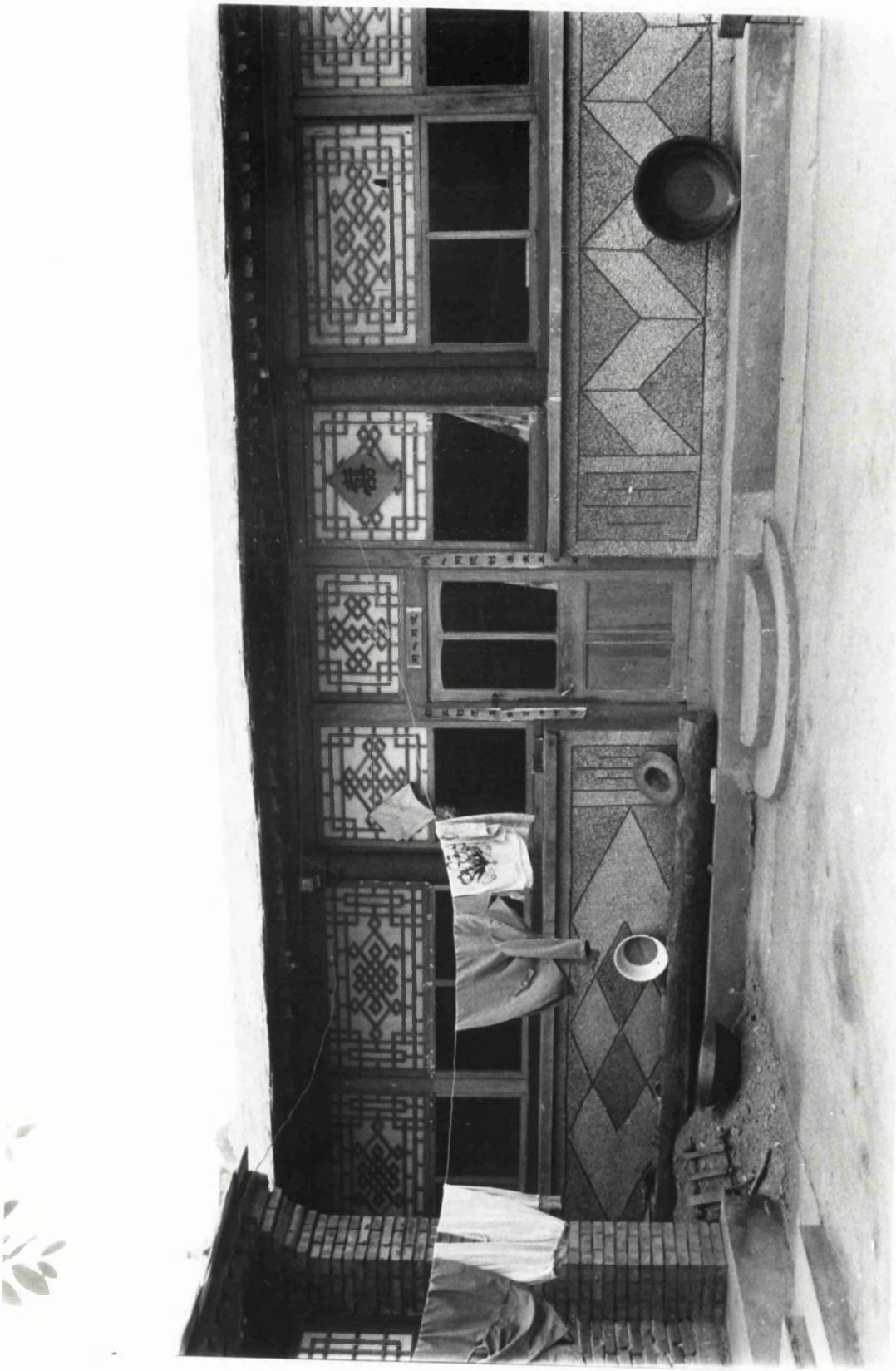
The courtyard form was dominant throughout the country. (1) Various reasons for this dominance may be advanced.

1: Enclosure

The form is remarkably common amongst other peoples and presumably in all cases springs from the desire or need to protect family and family property. (2) In the context of Chinese history and the development of the typical house form, this need can also be demonstrated, particularly in isolated farmhouses, which form the bulk of the Han tomb models. (3)

Farm buildings surrounded by a high wall of yellow earth which encloses single and double-storeyed buildings, animal pens and piles of hay and maize, just like those of the Han, can still be seen west of Xi'an and out into the Gobi desert. There seem to have been many more of such isolated houses with defensive walls in the Gobi in the 1930s when the protective nature of the building would still have been of great importance. (4) In the countryside, this need to enclose and protect the property and livestock that represented the livelihood of the family, the continuing need for protection through enclosure is obvious, but what is surprising is the survival of the enclosed courtyard house in

Courtyard, Zhoukoudian Commune (May 1983)



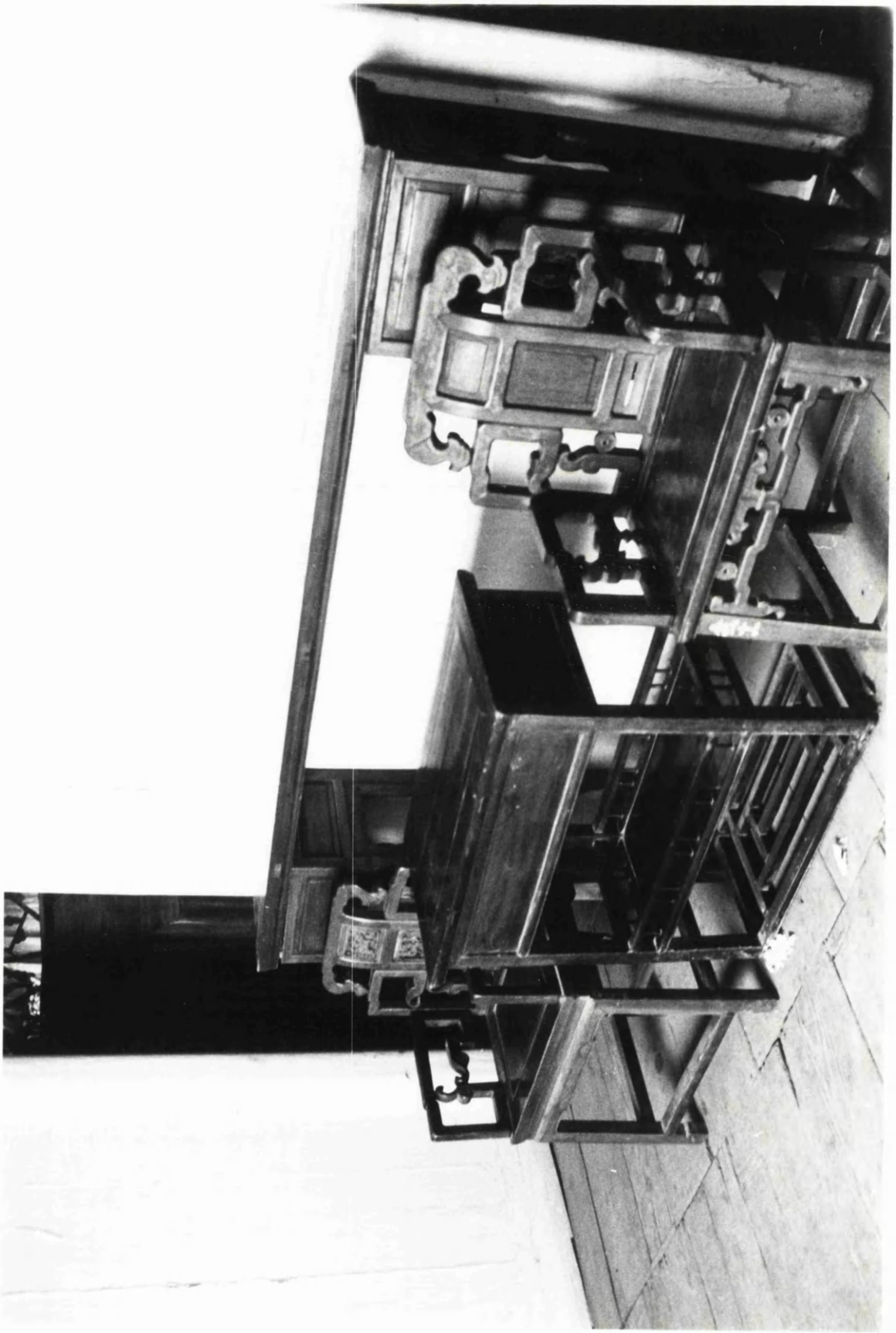
House, Zhoukoudian Commune, Southwest Beijing (May 1983)

towns which, in traditional China were themselves walled [5] and consequently protected. Within the towns, family livelihood did not invariably depend upon the activities and contents of the courtyard as it had in the countryside.

Perhaps the last part of family property that needed protection and concealment was the women. The life of all but the poorest women in traditional China has been compared to that of a frog in a well for, like the frog in the Zhuang zi(庄子) all she was officially supposed to know of the world was the square of blue sky above the courtyard. [6] Much early fiction in China is concerned with the life of women inside the home or the tantalising glimpses that they got of the outside world from the front gate. [7] The Beijing story behind the name of the 'Flock of swallows terrace' tells of young lovers who met clandestinely when the girl climbed the mock mountain in the garden at the back of the courtyard house and talked to her lover over the garden wall. [8]

Even now that single-family occupation of a courtyard is rare and the courtyard has become a communal space, the street outside is still a more lively and interesting place. On summer evenings, old people sit on low stools on the pavement outside their closed courtyards, young men play cards under street lights and young women hover near the doorways.

Though the courtyard form can be demonstrated to run from the Han through to the present day, [9] its continuity was not without interruptions, or variations. Liu Dunzhen has stressed the continuity but he was writing before the excavation of two Yuan house floors during the demolition of the last gates of the city of Beijing. [10] From these floors, it may be guessed that the common plan of three or four wings enclosing a yard, was slightly different in the Yuan when the central wing had two attached buildings at right angles forming two distinct courtyards, one behind and one in front of the main building.



Furniture: balance Sandalwood Grove Temple (May 1982)

Interior: balance Zhoukoudian Commune (May 1983)

This variation on the plan did not, however, break the principle of enclosure, it was simply a rearrangement of the elements within the enclosure.

These Yuan buildings did not break with the other fundamental aspects of the plan, those of southwards orientation of the main buildings and of balance on either side of the principal, north-south axis. These two aspects have a well-established and relatively unvarying history of continuity. (11)

An aspect of axiality is the reflection of balance in the interior furnishings. Chinese furniture very commonly consists of sets of articles which immediately provide the same east-west balance as is found in the courtyard house. A table may be accompanied by two chairs just as the central wing of the jian, used as an entrance or a communal hall, is balanced by the two jian on either side. (12) This same balance and symmetry in interior furnishings is not found in either Japanese or Korean houses (13) and emphasises the Chinese feeling for odd numbers. In buildings and furnishings, odd numbers allow for focus (the central room, the table) and symmetry (the two chairs, the side rooms).

2: Structural reliance on wood

The construction features of the Beijing house were also firmly established early on. The structural reliance on wood and the trabeate frame can be traced back through the Han, Zhou and Shang to its beginnings in the late neolithic. (14) Like many other aspects of Chinese building, the strength of tradition seems to have outweighed practicalities for structural use of timber continued despite both a technical mastery of the brick vault and a gradual but growing shortage of timber in North China. (15) The last problem meant that when houses were demolished, wooden parts in particular were carefully saved for re-use, a practise which can still be seen when houses are demolished or repaired in Beijing today. (16)

The structural reliance on wood which is such a dominant feature of Chinese architecture, has puzzled many scholars. It is argued that since the Chinese were quite capable of building brick-vaulted buildings in the Ming when the supply of timber was drying up, they might have turned to brick as a substitute and the refusal to do this is somewhat baffling. Earthquakes have been cited as a possible reason for retaining timber structures. (17)

The earthquake argument also occurs in discussion of Japanese building. It has been argued that the climate and earthquakes make load-bearing walls useless, providing a practical justification for the timber structure as an earthquake-proof form. But Engel points out the contradictory treatment of the Japanese roof (which closely parallels that of northern China): "In spite of ever-recurring earthquake damage, the over-dimensioned roof construction and heavy roof load of clay tiles and clay joinery have been maintained without any visible attempt to reduce the dangerous top weight or to increase the dimensions of the undersized vertical members ... even minor horizontal earthquake shocks thus may easily become fatal because the upright framework fails to transmit the shocks to the roof. The roof then with its unmoved enormous load pushes the supporting members out of their vertical position." (18)

Engel's dramatic picture is less acute in China where the need to overload the roof is less keenly felt in the absence of frequent typhoons. It is also true that a very gentle pitch to the Beijing roof lessens the danger and roofs are generally gentler in pitch where they are heavier in construction in the north of China. The lighter roofs of Suzhou, markedly pitched, consist only of slat purlins and light tiles whilst the Beijing house has a roof of clay tiles laid in thick clay and straw but a very slight pitch, creating a flat platform which would be relatively difficult to topple in an earthquake. (19)

Thus Chinese houses, at least those of the north, are reasonably designed as far as resistance to earthquakes is concerned but, as with south-facing orientation, the system was established in the neolithic period, well before seismology. It may be, however, that the retention of the trabeate timber frame in the face of diminishing timber supplies was prompted by its relative efficiency in earthquakes, rather than the other way round. As earthquakes are less common than in Japan, earthquake resistance is of less significance in Chinese building and should not be considered a major influence in the adherence to timber.

3: Climate and variations

Aside from earthquakes, climate has some effect on construction in China. Whilst houses in the south are sometimes quite solidly constructed, (such as the group of Ming houses in Anhui with thick brick external walls) maintaining a more even temperature through their thick walls, others, for example, are very light in construction. The roof tiles in Suzhou garden-house complexes are laid directly on wooden eaves boarding and many facades consist only of carved wood. (20) In Beijing, by contrast, the outer walls of a house are usually about a foot thick, solidly constructed of brick with only the upper part of the facade composed of light wooden lattice pasted with paper. The roofs of Beijing houses also have a thick layer of lime, mud and straw laid over the eaves boarding and then set with thick grey tiles, all providing more insulation than is necessary in the lighter buildings of the Jiangnan area. (21) Further north than Beijing, even thicker walls may be found as in the Upper Monastery at Datong. (22)

Though such variations, based on practical adaptation to varying climatic conditions, are striking, a few observers noted a difference between north and south which was primarily one of form and decoration.

Huc, one of the few foreigners to stress the north-south contrast, wrote that though the cities of the north were characterised by wide, straight streets, the buildings were, in general, inferior to those of the south. He noted that southern cities did not display the same

generous, regular street plan but were narrow and tortuous. (23) He enlarged upon the 'superiority' of southern houses which rested above all upon the decoration of the windows and of the roof with its upturned eaves and fabulous tile animals and dragons. (24) The same contrast was noted by R.F. Johnston in his description of houses in Weihaiwei where the simplicity of construction, materials and ornament in buildings... "evidently constructed for use and not for outward show" meant that ... "not much, except a few twisted gables ... reminds one of Southern China."(25)

There was then a view of the decorative south and the utilitarian north (as has been noted in the survey of literature). Chinese domestic architecture both in the Qing and today is far more varied than this simple division would suggest, though the greatest regional variety occurs within the south. Some idea of the variation can be built up from travellers' accounts and more recent investigations of Southern styles. Though various styles, particularly of roof design and ornament, can be distinguished, these frequently overlap and may be used within the same group of buildings.

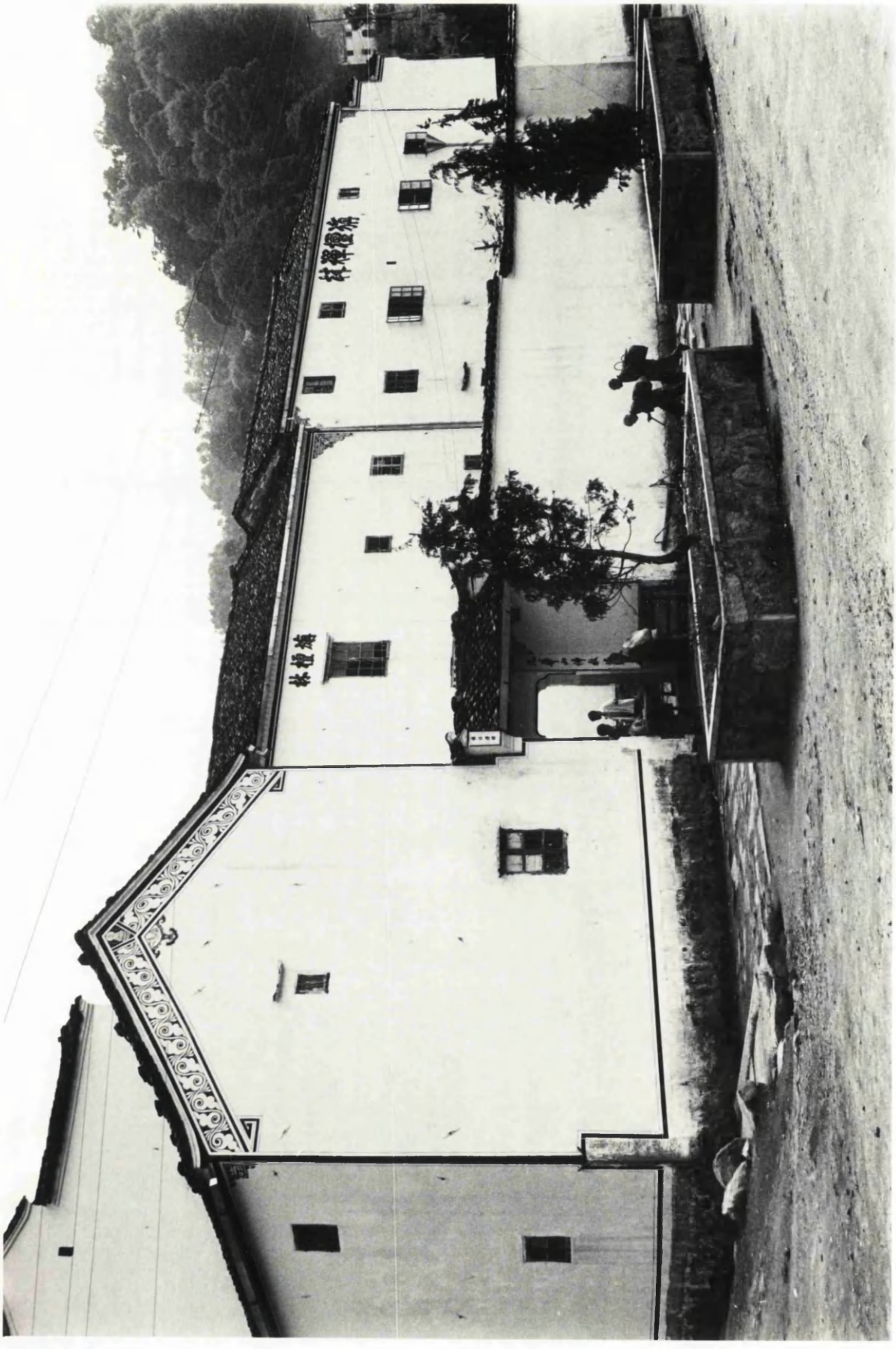
A characteristic area of decoration was the gable end wall which often stood well above the roof level. In Guangdong villages where houses were sometimes terraced, (26) the gable was often built up in a smooth 'wave' shape (27) and a series of rows of houses with 'wave' gables can sometimes be seen. (28) The same sort of 'wave' gable is found on individual buildings in Guangdong province.

Liu Zhiping illustrates a single gable in a more complex 'wave' form which he calls a 'bow' shaped gable. The same smooth 'wave' gable was found on late 19th century houses in Shanghai and in Yunnan and Sichuan.(29) The terraced plan of Guangdong villages might seem to indicate a departure from the commonly found courtyard plan but since a house often consisted of two separate buildings (each in its own terrace) with a narrow lane in

between which affords access as well as light and ventilation, the lane separating and linking the parts of the house, performed many of the functions of the courtyard. (30)

Another form of gable end wall, found in many parts of South China is the 'stepped' gable, (31) seen mainly in Southern Anhui, Hunan and Jiangxi; (32) these are usually found in houses with high surrounding walls of brick or stone, enclosing a two-storey house. The interior (and the frame) are of wood and the design of the interior is built around a small courtyard with a shallow pool under a narrow opening in the roof, the 'heaven-well'. (33) The projecting upper story is supported on wooden columns and the screen walls and windows or balcony may be elaborately carved. Though the wood is usually left dark, any visible brick is often white-washed so that despite the narrow opening, the interior courtyard is quite light and because of it, it is also cool. (34)

It will be noted that such buildings are two-storeyed and this is an aspect of southern building which is quite widespread, occurring in Suzhou, (35) Anhui, (36) Yunnan, (37) and the Shanghai area where Taylor describes the timbering of the upper floor as being laid with the smooth side downwards so that it formed a fine ceiling for the lower, more public apartments. It was not considered necessary to be very particular about the flooring in the upper storey since this was used by the family for sleeping quarters and would not be seen by visitors. (38) Boerschmann describes three-storeyed houses in the city of Ningbo. (39) The relative prevalence of multi-storeyed building in South China has a history of nearly a thousand years but is rare in the Beijing area where in the nineteenth century, the uniformity of the single-storey dwellings was such that Lord Stanley was moved to remark, "Peking's a gigantic failure, isn't it? Not a two-storeyed house in the whole place, eh?" (40) Although this was a sweeping statement and inaccurate, it serves as a generalisation.



Painted decoration, Sandalwood Grove Temple, Jiuhuashan, Anhui Province

Towards the end of the Qing, Beijing aristocrats and rich merchants sometimes built two-storey houses. The upper floor was, in theory, restricted in height and only to be used for sleeping quarters. In contrast with Lord Stanley's view, Qi Rushan considered that the lowness of the average house in Beijing was an asset, promoting better ventilation and lighting than was found in the taller houses of the south.(41)

The two-storeyed houses of South China occasionally comprise more than one form of gable; in Anhui and in Taiwan, some have a mixture of the 'stepped' and 'wave gable forms.' (42) They also incorporate another form of roof decoration which can be found in other southern provinces, particularly Jiangsu and Fujian, (43) a broken ridge consisting of a central downcurving line ending in two raised projections (longer versions of the simple 'owl tail' to be found at the gable ends of many Beijing houses). Sometimes, where this curved ridge line extends the length of the (wider) central jian of a building, the two side jian also have ridges which curve upwards at the gable ends. In grander buildings these curved raised ridges are also decorated with tile and cut brickwork, recalling Abbé Huc's fantastic animals and mixing floral designs with dragons. (44)

Another striking aspect of Southern architecture is painted decoration. Many walls in all of the provinces south of the Yangtse are painted white, contrasting with the dark roof tiles and the green of the surrounding countryside or evergreen foliage in the courtyards. In Sichuan, (45) whitewashed walls with dark structural timbers set in them make attractive patterns and in Anhui the whitewashed walls have spiralling painted decorations around the doors and under the eaves.(46) In Hunan, similar painted designs are found on gable end walls. (47)

A further group of southern buildings which have been studied in detail are the house-garden complexes of Suzhou. (48) Here, though the buildings are built to the courtyard plan, there is often great

irregularity of plan, a departure from the balance and axiality often taken to characterise Chinese architecture. South of the Yangtse towns, as Huc noted, were not as spacious and regular as those in the north and individual buildings showed the same disregard for axiality and balance. (50) In other respects, the Suzhou house-garden complexes show further southern characteristics. The use of colour, with muted natural colours on woodwork, dark tiles and whitewashed walls, sets off the natural greens of garden plants. (51) The roof lines show the stepped gable but above all linear elongations of the ridge and upward curves to the eaves line. The upward curving eaves have long puzzled Western travellers who fell back on the tent theory to explain the extravagance. (52) It is likely that there is some basis in practicality for the longer eaves of the South were necessary to protect the woodwork from considerable rainfall and the inhabitants from excessive heat from the sun. Raising the eaves protected from the midday sun (since the eaves were deep) but allowed more of the gentler slanting morning and evening sunlight into the houses. Practicality was soon overtaken by aesthetic considerations for the lightness of the uplifted eaves line provides less of a break between inside and out in constructions which were intended to be both garden and house, and they reflected the curves of the natural forms found in plants and rocks, as Liu Dunzhen noted (52a).

The Yangtse serves as a rough division between North and South in architectural terms. North China is slightly more homogeneous in styles of domestic architecture than the south, but it is not without variation. As travellers noted, domestic architecture was, and is, less elaborately decorated than in the south but it is, nonetheless, decorated. A major area of decoration in both north and north-west (found in the Zhengzhou area, Beijing and the countryside around Xi'an) is the ventilation holes often set in the gable end wall just below the ridge. These are usually

made by setting roof tiles in the wall, their semi-cylindrical shapes forming ogives and rounded double-diamond forms. Sometimes the ventilation vent area may be surrounded by decorative cut-brick. (53) Cut-brick decoration is found, as it is in the south, around the main gate and under the eaves. In the north, it is common for the gable end walls of the house to project beyond the facade to offer extra support for the shallow eaves overhang and at the top of this pilaster, especially in the Beijing area and Shandong, there is often a cut-brick plaque, usually with a flower-basket design. The recurrence of this design and its regular size suggests mass-production in the late Qing. (54)

Aside from applied decoration, the clarity of the plan is more obvious in the north because, owing to the colder climate, the courtyard is usually larger and more open than the 'heaven well' of the south. This is particularly true in the far north; in Beijing, courtyards are usually 9 m x 9 m, and quite open, in Inner Mongolia they are even wider. (55) There is still some variation, particularly in the northwest, in the Xi'an area, where courtyards are narrower and set east to west, as they are in the south, (56) to minimise midday glare and maximise morning and evening light.

Another aspect of building which is more consistent in the north is the predominance of the single-storey building with a double-pitch to a flattish roof. This form is seen particularly in the North China plain, but in the far north, in Inner Mongolia, the roof is often more steeply pitched with a short slope on the north side and a longer slope into the courtyard to maintain drainage whilst keeping as much of the house in the sun as possible. (57) In the Xi'an and Luoyang area, the characteristic roof profile is a single-pitch, into the courtyard. As these buildings are often double-storeyed, the effect is of a steep, acutely-angled single pitch into the courtyard. (58)

4: Orientation and geomancy

The accent on the north-south opening of the courtyard in Xi'an is dictated by climatic factors, as is the fundamental principle of the orientation of the courtyard and the buildings which form it. In all forms of Chinese architecture and in all parts of China, the major buildings face south. This southwards orientation has such a long history that it antedates the earliest evidence of geomantic theory. Geomancy seems anyway to have had a far stronger influence in the south of China.

The plan of North and North-western houses tends to follow more regularly the three or four-sided courtyard form, without the irregularity sometimes seen in the south. (59)

The sense of the orientation of the Beijing house is expressed in the terms used to name the various wings. In Mei Lanfang's description of the house he lived in with his family in the early 1920s, a "very ordinary courtyard house", (60) the terms bei fang (北房) and shang fang (上房) are used interchangeably to describe the main, northern wing. The use of the term shang fang, "upper wing" is particularly interesting, especially when used in conjunction with dao fang (倒房) "upside-down wing," the southern wing which included the gate. This view of the house seems, in expression at least, to be restricted to Beijing but it reflects the depiction of houses in maps of the Qing period. (61) The house is intended to be viewed from the south, looking upwards to the main, northern wing which is often slightly raised and has the most impressive facade of all the wings in the courtyard. Thus the Beijing house is seen in terms both of orientation (bei fang) and importance (shang fang, dao fang) the latter view being expressed in graphic terms. A note added to Mei Lanfang's account explains that the latter terms are restricted to use in Beijing where houses are almost

invariably constructed on the base of such a strictly and regularly oriented plan that such a view is possible. (62)

The more varied topography of the South of China where such regular rectangular plans were not always possible, may account in part for the strong reliance on geomancers in the south to determine siting and orientation of buildings.

The material that we have on feng shui, both missionary and recent (63) is very much restricted to the south of China and writers such as Needham in discussion of the subject always refer to the two southern schools of Fujian and Jiangxi. (64) In sociological studies of the Beijing area, where there are references to houses and house-building (65) there is no mention of geomancy. Liu Dunzhen's reference to a difference between northern and southern feng shui is tantalisingly brief. He notes that in the south, the main entrance is on the main north-south axis, in the south wall, whereas in the north, it is more usual to find the entrance, still in the southern wall but either to the east or west of the central axis. (66)

Another authority states firmly that in Beijing, the entrance should be sited to the south east of the main, for luck. No other explanation is offered but elsewhere it is stated that it was the Emperor's privilege to enter on the main axis. (67)

Similarly, Martin Yang's study of a village in Shandong mentions geomancers as being consulted, most prominently in connection with the siting of graves. (68) It is obvious that a lack of reference does not necessarily imply that geomancy was never invoked in house construction but that in the absence of positive material, it may be concluded that geomancy played a far less important part in the construction of dwellings in North China than it did in the southern provinces.

One of the reasons for this may have been the relative absence of secondary burial in the area around Beijing. It was most commonly in (when bodies were dug up, the bones scraped clean and put in pots in a permanent resting-place) connection with secondary burial, that southern Chinese and members of overseas Chinese communities consulted geomancers and though it is strange that a practice that is so strong in the south was rare in the north, its absence may account for the lack of influence of geomancers. (69)

In contrast, the arguments over the geomantic location of Beijing in the early Ming and references to the geomancy of both Beijing and the Ming tombs enclosure imply that the royal house consulted geomancers over important buildings and the siting of the capital. (70)

Both De Groot and P'eng Tso-chih give descriptions of Beijing's geomantically favourable site, "Peking is protected on the northwest by the Kin-shan ... or Golden Hills which represent the tiger and ensure its prosperity, together with that of the whole Empire and the reigning dynasty. These hills contain the sources of the felicitous water-course called Yu -ho or Jade River, which enters Peking on the northwest and flows through the grounds at the back of the imperial palace, then accumulates its beneficial influences in three large reservoirs or lakes dug on the west side and finally flows past the entire front of the inner palace where it bears the name of the Golden Water. Its course therefore perfectly accords with the principle..." (71)

P'eng's account(72) is fuller than that of De Groot although both agree on fundamental points. Beyond the site, there are many variations on the no zha (哪吒) legend explaining the number of gates in the walls of Beijing and comparing the arrangement of the city to that of a man's body; all of which is a post-facto mystification of the form of the city. (73)

Most authorities, ancient or contemporary, remark on the checkerboard regularity of the streets of Beijing, a feature of the city which has been consistent at least since the Yuan and which makes Beijing the classic re-

presentative of traditional town planning ideals in China. The Yuan capital layout is described by Hou Renzhi and Jin Tao as conforming fundamentally with the Kao gong ji (考工紀) section of the Zhou Li (75) (周礼) and Marco Polo describes the city with its large housing plots (周礼) and broad straight streets laid out like a chessboard. (76)

Farmer, in his discussion of the choice of Beijing over Nanjing makes it clear that whilst the strategic site was advantageous, there was some worry that Beijing's geomantic advantages had been exhausted by the defeat of the Yuan. (77) Geomantic considerations were, however, clearly secondary to those of the defence of the empire (78) though justification for the re-occupation of Beijing could be couched in geomantic terms for if the city itself is the most pure example of ideal traditional town-planning, its site confirms to geomantic ideals. Though the site may be geomantically perfect, the city is not quite perfectly oriented. (79)

Despite this imperfect orientation, one aspect of the site of Beijing is that it is very flat, as is the Hebei plain surrounding it and stretching southwards. This, together with the lack of irregular, natural areas of water (such as are found in Nanjing), leaves the grid of streets very clear and uncluttered. As the city itself was laid out in a regular grid of streets, this grid with its consistency of orientation, determined the orientation and plan of the houses on the plots that were cut up by the streets. (80) It was therefore quite unnecessary to consult geomancers about individual buildings within the city for the city itself dictated the orientation, the shape of the site and the consequent plan of the house.

The strict axiality of the city street grid with its alignment to the points of the compass affects the life of the inhabitants in various ways. They are noted for their use of the cardinal points to replace 'right' and 'left' as in Zhang Henshui's novel, 'Fate in tears and laughter'

where the hero (who is not from Beijing) asks a policeman the way. "The policeman told him that the Island Pavilion was on the west of the street going south. (The whole city of Peking is a gathering of square shapes: all the streets and alleys run north to south or east to west. People's houses are also the square-shaped 'four-attached courtyards.' So everybody there, young and old alike, knows the four directions and in speaking refers not to up, down, left or right, but to north, south, east or west)" (81) Zhang Henshui's progression from street grid to square house underlines the relationship between the plan of the city and of the small domestic courtyard, where the main building is usually designated by its compass position, bei fang. (82)

Chapter 5: Functions of the Courtyard House: Size Allows Differentiation

The H house and the houses behind the Peace Hotel are single courtyard dwellings which would, ideally, have been inhabited by one family, although poor families were often compelled to share courtyards and live in very crowded conditions. In his novel, Luo tuo xiang zi (骆驼祥子) (Rickshaw Boy) which describes life in pre-1949 Beijing, Lao She describes these crowded conditions, "there were seven or eight families living in their tenement courtyard, most of them crowded, seven or eight, old and young, into one room ... Ashes, dust and slops were all tipped into the yard, which no-one bothered to sweep ..." (1)

A family that started off in a single courtyard might eventually acquire an adjoining house if its circumstances improved, as did Mei Lanfang. (2) At the other end of the scale, Princess Der Ling described her own house in Beijing, "This, like all Chinese houses in Beijing, was built in a very rambling fashion and, with gardens, covered about ten acres of ground ... it had sixteen small houses, one storey high, containing about a hundred and seventy-five rooms arranged in quadrangles". (3)

Linked by plan and construction methods, these different houses are part of a linked hierarchy, linked not only in plan but in function.

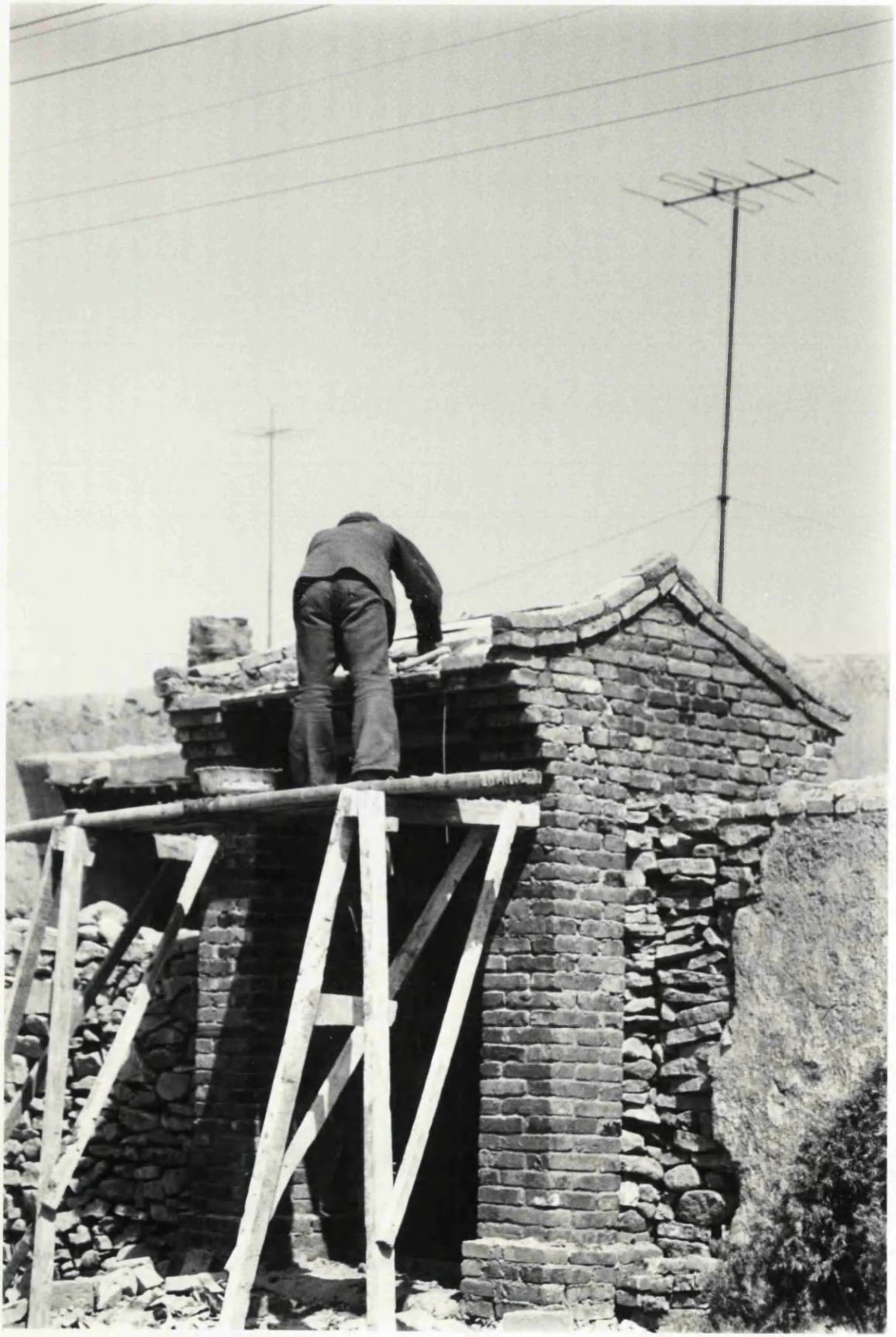
A family's requirements in housing were naturally determined by the size of the family and its economic position. Variation was achieved largely through the size of the whole enclosure which allowed for differentiation. A description of the Gong wang fu (恭王府) and Liu Dunzhen's 'typical Beijing courtyard house' may be set against the H house, reflecting the range of possibilities dependant upon size and wealth.

The house was ideally constructed to be inhabited by various branches of the extended family, hence the series of courtyards, each to be occupied by a son and his family whilst the central, main courtyard was for the master of the house, his wife, and unmarried children. (4)

The Qian long map map of Beijing shows areas of the town where there were considerable numbers of 'fu' or mansions. (5) These represented the highest form of housing, to which lesser inhabitants of the capital might aspire. As is noted in the chapter on construction, even if a family possessed a mansion, it was sometimes let out if family fortunes declined and the family would decamp to a smaller residence nearby. The mansion remained the ideal and is perhaps best described by that in the novel Hong lou meng (红楼梦) inhabited by the Jia family.

This mansion was very likely based on the Gong wang fu just north of the Forbidden Citv in Beijing (6) which may have been Cao Xueqin's (曹雪芹) home for a time. (7) The house consisted of three parallel courtyard systems, each four courtyards deep. The central courtyards were the main ones, inhabited by Jia Zheng (贾政), Baoyu's father (宝玉). The main gate was on the central axis and led to a wide courtyard. Directly north of the main gate was the ceremonial gate leading to a courtyard in front of the main hall. Behind this was the inner ceremonial gate and beyond that the main living quarters with the master bedroom in the main north-eastern room. If the master of the house slept anywhere else (assuming he had anywhere else to sleep), bad luck would strike the family. (8)

Mei Lanfang's description of his family house in Beijing illustrates the correct pattern on a far smaller scale. The northern wing was a five jian building. His paternal grandmother occupied the two western jian, there was a fo tang (佛堂) 'Buddha hall' in the central jian and the most important man in the family, his paternal uncle, occupied the two eastern jian of the northern wing. Since the house was a small one, though the paternal uncle was in the appropriate place, he was crowded in with his wife and two unmarried daughters. (9)



Construction of exterior gate, Datong (May 1983)

'Hanging flower gate' detail, Peace Hotel

In the Gong wang fu, behind the main north wing was another hall, another narrow courtyard, a brick pavilion and a narrow walk that ran all the way along the back of the complex and, finally, a single back gate on the main axis.

The eastern series of courtyards were occupied by Jia She (贾赦) and his family (he was the elder brother of Jia Zheng) and were simpler. The western series was entered through the west gate which led to a courtyard and then a 'hanging flower' gate leading to the main area of habitation. The decorative 'hanging flower' gate was a constant feature in such mansions, within the main gate. (10) The front series of courtyard were not inhabited by family members, as was customary and there was a stable in the southwest corner, reinforcing the non-private aspect of this first courtyard.

Liu Dunzhen's description of a 'typical Beijing courtyard house' falls somewhere between the noble mansion of Cao Xueqin and the reality of the H house: 'In general, the house is constructed using a timber frame with brick exterior walls. The roof is generally double-pitched although secondary buildings may have flat or single pitch roofs. Because of the cold climate, the walls and roof are thick and brickbeds are constructed inside. Both inside and out, the floors are of square bricks. The interior of the buildings is divided using various sorts of thin wooden screens, according to individual requirements. The upper part of the screens may be decorated with open lattice and pasted with paper and may be extremely decorative. Only nobles were able to use coloured glazed tiles, and a red main door with gold decorations but in ordinary houses, the main colour was the grey of the walls and roofs and perhaps some colour on interior gates. The roof ridge, spirit walls, main gate and other brick surfaces were sometimes beautifully carved.' (11)

The illustration of a 'typical Beijing courtyard house' shows a house with three courtyards: narrow entrance courtyard with the main gate set on the southeast and subdivided into kitchens and service areas, leading through a hanging flower gate set on the central axis to the largest courtyard which has three wings, all set on stone platforms with verandahs and 'ear' rooms to either side of the main buildings. The back courtyard, as narrow as the front one and containing only a low building which extends the full length of the back (Northern) wall, is entered through a gate on the south-eastern end of the main wing of the central courtyard.

In Liu's 'typical' house, the first narrow courtyard screens the family from the outside world, the central courtyard is spacious and the northern wing is clearly the focal building of the whole. Behind is a narrow courtyard with living quarters, farthest from the front gate, expressing the idea of privacy through depth. In the house, the single courtyard does not allow for linear depth and consequent privacy but the screen inside the gate performs a simple version of the same function, allowing a distinction between visitors who were met at the gate and those allowed inside the courtyard.

In the mansion, the separation of family units within the enclosure indicates the importance of hierarchy and privacy. Hierarchy was expressed in the use of the central axis for the head of the family and the main reception room on the same axis indicated the relative importance of guests and their position in an external hierarchy established by the family.

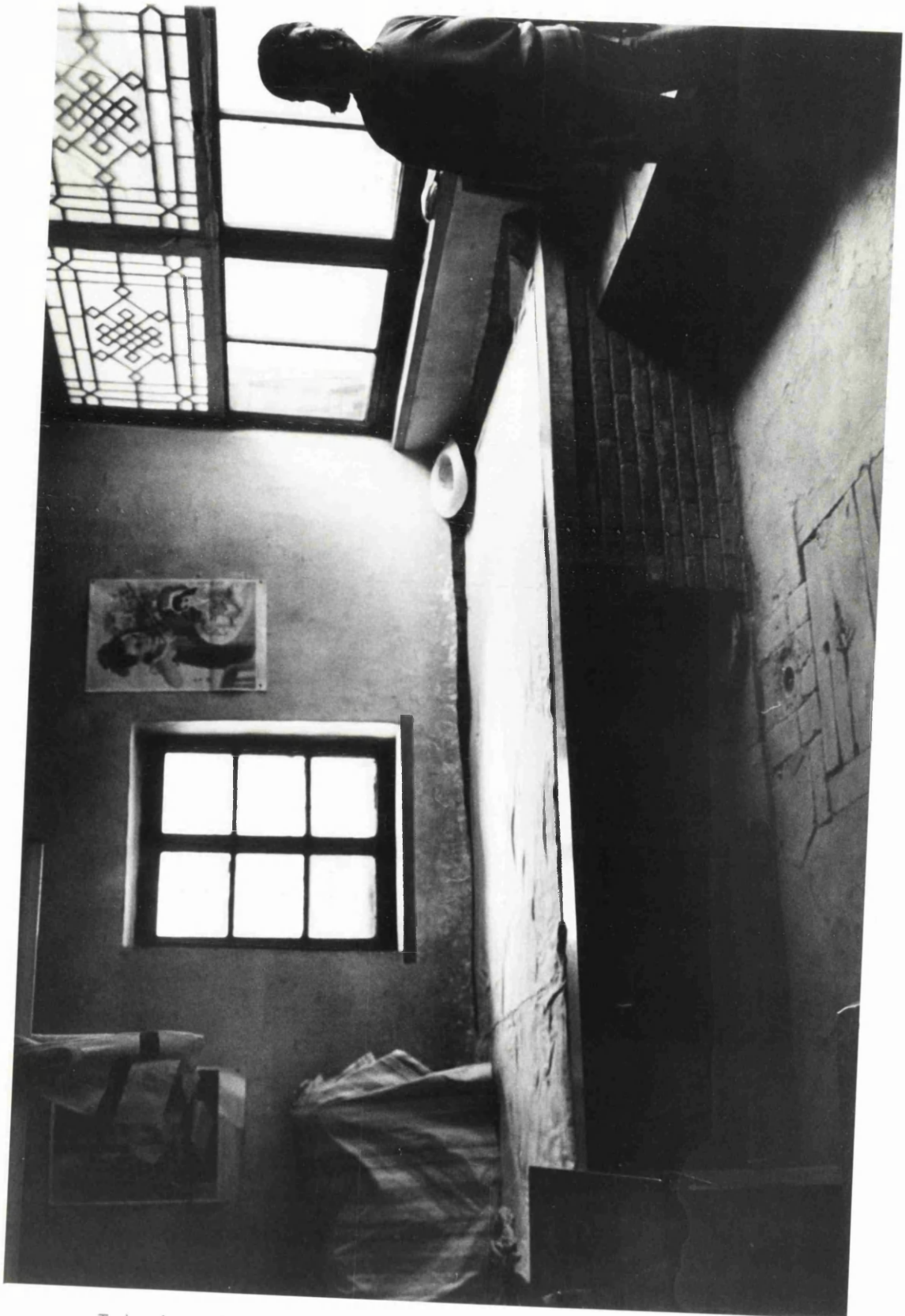
It seems that the separation of male and female and consequent hierarchy within the house based on sex was first established firmly in the Ming when as one of the late Ming '<u>jia xun</u>' (family instructions) contains a map which illustrates male and female 'paths' through the

courtyard complex designed so that the sexes should not meet by chance. Such separate 'paths' were only possible within a mansion with more than one parallel series of courtyards.(12)

Of considerable importance to the family itself was family-based worship. One jian in a large family enclosure would be reserved to house ancestral tablets and honour ancestors. The room chosen was generally the central room of the most important wing in the house. Home-based worship was particularly important for women and children who were forbidden to enter lineage halls. For them, worship of ancestral tablets within the home was probably their only participation in family ritual. (13) It may also be that city-dwellers who had left their ancestral villages and lineage halls found particular significance in this home-based worship. The choice of the most important (central) room in the most important wing of the house, central in that it was set back from the main gate, indicates its significance. In Mei Lanfang's house where his grandmother was a fervent Buddhist, the central room of the main north wing was a Buddha hall, not an ancestral hall.

Within a house enclosure, privacy and hierarchy were linked. Ideally, public areas were set within the gate and privacy and intimacy increased with depth and distance from the main gate. It was common to find that the first courtyard inside the gate was used for offices, servants' quarters (the gateman's quarters at least) and for guests who were not admitted to the family areas. In the case of small, single courtyard houses, like that of Mei Lanfang, the 'upside-down wing', the southern wing which included the gate, was used for guests. Though they were inevitably in contact with the family since separation was not possible within one courtyard, they were thus kept at the greatest possible physical distance from the main wing.

Depth was usually linear, distance from the front gate expressing the degree of privacy. (14) Secondary forms of concealment were made



Interior with kang, Zhoukoudian Commune (May 1983)

in the form of screen walls as in the H house. These served both spiritual and earthly ends. Inside the main gate, a spirit wall (usually a free standing wall directly inside the gate, often decorated with a cut brick floral design or glazed tiles or a good-luck character) kept out the evil spirits that could only fly in straight lines and also prevented passers-by from seeing into the court from the street. (15) Within the courtyard complex, such spirit walls could also be placed to screen buildings or, in internal gardens, artificial hills (either of earth or the characteristic southern garden form of piled lake rocks) could, similarly, screen and conceal. (16)

Apart from this use of the central jian and the superstitious aspects of usage such as the requirement that the most important man in the house should sleep in the north-east room of the main wing, rooms were not, generally, designated any specific function. If space allowed, the front courtyard was a public place, but in the areas occupied by the family, apart from studies or libraries, rooms were flexible in usage. In smaller houses, flexibility meant (as it still does in Beijing), multiple use. A room would be used for sewing and eating by day and become a bedroom by night. (17)

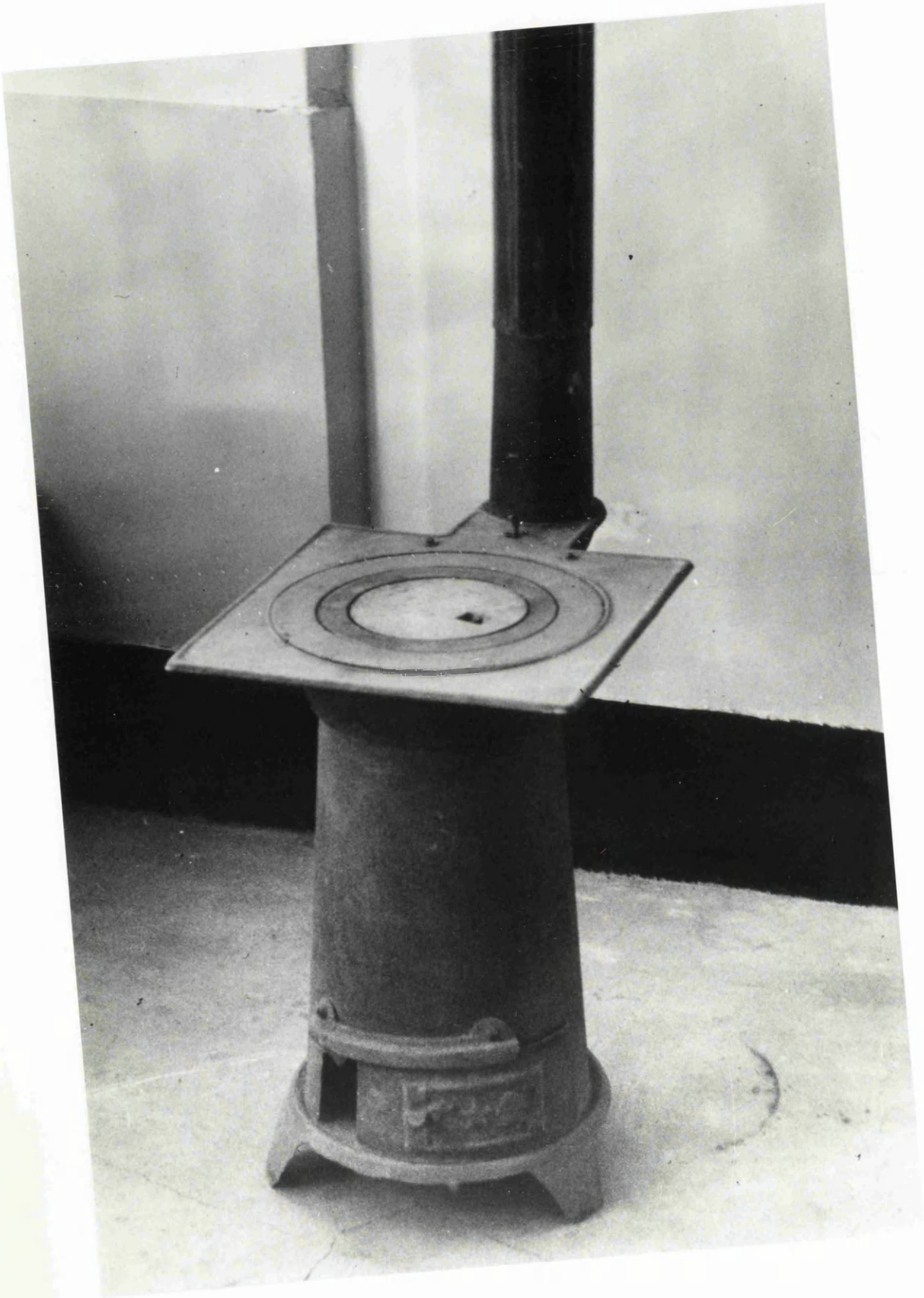
A fixture in northern rooms which affected both the flexibility and, increasingly, the furnishing of a room, was the kang (炕) or brick bed. This was normally built against the southern wall in the main wings of houses or against the front wall in the side wings, in both cases restricted to the rooms on either side of the central jian where a door made the construction of the kang impossible. (18) The kang was a hollow brick platform, slightly lower than window height. (19) Constructed out of the straw and mud bricks that were used in house construction, in poorer buildings where the proportion of straw was higher, there was sometimes the danger that the kang would catch fire and smoulder. (20)

The kang was heated by placing a small stove burning coal balls underneath it or, if there were cooking stoves nearby, it was common to find that the flue from the stove ran under the kang providing an extra source of heat. (21) Covered with matting or a brightly painted oil-cloth (22) and piled with quilts, it was a warm place to sit and work by day and a warm bed by night in the cold north. (23)

To enable people to read and work comfortably when sitting on the kang a range of specially designed low tables and cushions existed (24) and the comfort of the kang was reproduced in the wooden benches which lined some of the halls in the Summer Palace outside Beijing where, though kang were not installed since the building was not intended for winter inhabitation, the fixtures imitated the kang. (25)

Though kang are still to be found in houses in the countryside surrounding Beijing, they have become rare within the city itself. Early western visitors to the area describe them, perhaps the earliest description being that of Ides (published in English in 1706) (26) and long-term residents of the city say that they used to be more common. (27) It seems likely that they began to be removed in the 1930s since the increasing vogue for large pieces of foreign furniture made the need for more space within rooms increasingly pressing. The kang used to take up as much as a third of the space within a room (28) and it appears that, like window-paper which was increasingly replaced with glass, they began to be considered old-fashioned. (29)

The stove under the kang or a stove in the centre of the room was usually the only form of heating and since the floors were not covered, it was warmer on the kang than elsewhere. The coldness of Beijing houses is one aspect of the general failure to consider services in traditional dwellings. (30)



Stove

Solutions to Beijing's extreme climate: stove pipe and bamboo sun-blinds

Exterior stove, Zhoukoudian Commune (May 1983)

Only in the largest complexes was there a proper kitchen building, set in an unimportant corner. (31) Latrines were similarly set in corners and it is probable that households with servants made use of night-soil buckets which were cleared by the servants. (32) Where there was no separate kitchen building, cooking was usually done on outside stoves, set against the walls of the house and only occasionally protected by some kind of roof, as in the H house where cooking was done in a corridor.

If a house had a well within the courtyard, the supply of fresh water was not a problem. The majority of households, however, relied upon water-sellers who called daily. The water-sellers were mostly natives of Shandong province; such regional specialisation was common in the trades; washermen came from the Suzhou area, or if they did not, they would often have spent a couple of years in Suzhou to acquire the local accent. Water-sellers often handed out little bamboo tallies which were hung by the gate as a record of sale and a lump payment was then made by the month. (33)

An aspect of the house described in Hong lou meng that is more specifically related to the southern origins of the family, is the description of the preparation of a separate residence and garden to receive the Imperial Concubine. (34) Though this construction can be related to those constructed by the Cao family to receive the Kangxi emperor, and consequently very firmly based in the south, rich families in Beijing sometimes purchased adjoining plots to construct gardens as well as setting them up at the back of the courtyard house complex. (35) Mansions often had considerable gardens which ran from front wall to back, along three or more courtyards. They were constructed on the same lines as those of the south, with massed rocks, small pavilions, stone carved flower beds with flowers of the four seasons and, if possible,

water. This last, one of the essential features in the Jiangnan garden, was less easy in Beijing with its lower water table and lack of streams.(36)

There was often a small hill or mock stone mountain at the back of the garden, near the wall so that women, forbidden to leave the house except in covered sedan chairs, could look over into the street. The romantic possibilities of this view over the street have been used in a folk story already mentioned, about the Ju yan tai (聚燕台) 'Flock of swallows terrace' where the lovers meet at the back wall, the girl standing on a mock mountain. (37)

The climate of Beijing is not conducive to year-round gardening but various changes were made in gardens which made them reasonably successful. The most obvious is the use of pot plants of all sorts. These were kept for the winter in rooms lined with good paper which was coated with tong oil and they were then brought out to flower in summer. (38)

All sorts of plants were grown in pots, including single lotuses in large ceramic basins. Another distinctive aspect of northern gardening, seen in private gardens where the plot size allows for pavilions, is the use of colour. It has been noted that Suzhou garden architecture was painted in dark, natural colours but Beijing gardens, whether imperial or private, often had bright reds, yellows and greens on their buildings, to provide colour in the colder months. (39)

For those who did not live in mansions but occupied a single courtyard, gardening within that courtyard was still important both for practical and aesthetic reasons.

That a true was an almost invariable fixture in a courtyard is borne out by western accounts of late nineteenth century Beijing as 'rus in urbe' or 'a green wood surrounded by a high wall'. Pierre Loti, standing on the city wall, found "Pékin à mes pieds, semblable à un bois." (40)

The trees planted in the courtyard were subject to the mixture of practical and superstitious ideas which characterise Chinese gardening.(41) Plum trees were not considered ideal as they might attract insects and mulberry was not to be recommended as the roots tended to get too big and threaten buildings, poplars were not very pretty in spring. Peaches were all right but not usually kept for more than five years. Ideal trees were the Chinese scholar tree and whilst the Chinese parasol tree was acceptable in Beijing, it was considered unlucky (as were pine trees) in Shandong. (42) The trees were important in providing shade in summer which was otherwise obtained by the erection of a temporary awning over the whole courtyard. Practical considerations apart, it is clear that the inhabitants of Beijing's courtyard houses were, economic considerations permitting, devoted to plants and to making the most of the courtyard in summer. The phrase 'a mat tent overhead, a flowering pomegranate and a goldfish in a pottery jar' was a popular phrase used, not to describe the charm of a summer courtyard but the conformity of the capital's inhabitants since these were so universally found. (43)

It is clear that it is above all size which differentiates Beijing houses. If space permits, rooms may be differentiated by function and, if space permits, a real garden would replace the small gardening efforts made within the courtyard. The vine of the H house contributed to Loti's view of Beijing as a wood, though not as generously as the spacious garden of the Gong wang fu.

Leaving function aside, for the basic function of protection and enclosure of family property and activities were required by all, authorities have usually divided Beijing's houses into groups on the basis of size. (44) The most obvious and commonly cited example of the largest type of house, the fu, was the Gong wang fu, to which may be added the fu inhabited until recently by Song Qingling. (45) It will be argued (see

concluding chapter), that the fu should not really be considered on the same terms as the smaller house (46) and Chen Mingda does not include fu in his division of houses. (47)

Beneath the fu come the 'middle-sized' houses which some authorities sub-divide into two types, the larger and the ordinary middle-sized houses, (48) rather like peasants. (49) If the two categories are combined, then examples of the larger house include the Ban mu yuan (半亩园) (50) and the Sichuan restaurant in Xuan wu men wai (宣武门外) (51) which was once inhabited and has not been substantially altered since it became a restaurant. These comprise a considerable number of courtyards, in the case of the Sichuan restaurant, arranged principally along one main north-south axis with subsidiary courts to either side. (52) The Ban mu yuan is similarly arranged but to the east of the main axis with its inhabited courts is a garden area which extends the length of the main axis. (53) Though these complexes cover a considerable area, in decoration and in the plan of individual buildings, they closely resemble the single building of the Z house with its verandah and carved facade. (54)

The ordinary 'middle-sized' house is also represented by the anonymous buildings along Bei chi zi (北池子) (55) and behind the Peace Hotel. (56)

The most commonly cited representative of small Beijing houses is that once inhabited by Lu Xun which is now the Lu Xun Museum, near the Bai ta si (白塔寺) (57) in north-western Beijing. (58) Comprising a small courtyard with a main northern wing, and a very small back yard, it is similar in plan to the H house though it still has two small side wings of two jian each. (59) In construction, it is closer to the W and Z houses. The northern wing is raised on a stone platform (like the Z house) and in the relative simplicity of the facade, it resembles

the W house. Like both the W and Z houses, it has a double-pitched roof with no raised roof ridge, the tiles are laid smoothly over the ridge in a tiling pattern that is common in Beijing, though not represented in the Z and W houses which both have alternating rows of semi-cylindrical tiles and flatter tiles. Lu Xun's house has alternating rows of identically shaped tiles which are slightly curved. Those that are laid with the curved side uppermost, are raised above the others on a couch of mud and lime to provide a more angular version of the tile profile found on the Z and W houses.

Lu Xun's house also has a small back addition called the 'tiger's tail'. The writer used the back extension whilst his mother lived in the eastern room of the main wing and his wife in the western (in defiance of the belief that the man of the house should sleep in the northeastern room of the main wing.) The southern wing was used as a library and to house guests. (60)

Both in its size and lack of decoration, as well as its minimal number of rooms which did not allow for much functional separation of activities, Lu Xun's house is closest to the H house and to the W house. The carved facade of the Z house suggests that it belongs, in decorative terms, to the 'middle-sized' class, a group which is differentiated fundamentally by the area occupied but it was probably inevitable that a house which occupied a larger area should also be more decorated. The occupation of a larger area did not necessarily mean that buildings were actually constructed on a grander scale, (61) thus the Z house may be considered to belong to the middle group.

Chapter 6: Conclusions

From the preceding description, it may be concluded that the Beijing courtyard house is a reasonable adaptation of a form to specific climatic conditions and that the house itself can be adapted to individual family requirements. Its adaptability rests on two major factors: the non-specific conception of a room and the building system itself.

The non-specific conception of the room is part of the architectural tradition. Differentiation occurs only through position within the plan as in the case of the central *jian* and the main wing, for example.

The building system in China was divided into two distinct parts, grand and vernacular and this division enabled one specific aspect of the adaptability of the house form to distinguish house-building from grand building.

From the measured drawings and the list of *jian* sizes appended, it is clear that the jian size found in domestic architecture in the Beijing area in late nineteenth and early twentieth centuries was between 2.5 and 3 metres, most commonly near 2.5 m.

Two conclusions may be drawn from this result. One is that there was no absolute measurement governing domestic construction and the other that, in the absence of an absolute, there was concensus on the desirable and practical dimension. (1)

The lack of an absolute measurement governing domestic architectural construction demonstrates the separation in traditional China between grand and ordinary architecture, for the former was constructed according to rules of proportion and dimension laid down in officially approved building manuals. (2)

It is generally accepted that the *Ying zao fa shi* was a building manual to be used by those constructing palace and official buildings

in the Song and that later manuals of similar type were used by official builders. It has been suggested (3) that the Lu Ban jing was a building manual, a source of information on vernacular building, almost a proletarian equivalent of the Ying zao fa shi. (4) The text, or a couple of texts of the Lu Ban jing have been published with an introduction that suggests a similar claim and that it is "a unique piece of traditional technology." (5)

An examination of the two texts of the Lu Ban Jing available gives no substance to such claims. The latter half of the text consists of protective cantrips and illustrations of the physiognomy of houses and, where superstition and superstitious practices were of great importance, can be considered as a folklore manual, a series of instructions on what to do and what not to do. The first part of the book, after the biography of the legendary Lu Ban, lists types of building with woodcuts of carpenters at work under the benevolent eye of an official (Lu Ban?). Whilst the depiction of the carpenters' activity is accurate and the rendition of tools quite credible, the carpenters work under structures that make no sense at all. There is a series of prescribed measurements but their significance lies in the magical properties of certain dimensions, not in the construction of desired proportions. Dr. Ruitenbeek has done a considerable amount of work on the Lu Ban Jing and demonstrated the divisions of the carpenters' square into 'good' and 'bad' inches. This use of lucky dimensions coincides with Li Xueqin's experience of the use of geomancy in determining heights of doors and walls (to the same favourable end). (6) Ruitenbeek has not, however, investigated the practical application of the Lu Ban Jing. The Ying zao fa shi, by contrast has been used in this way and in a recent publication on a Liao wooden pagoda, it has been demonstrated that the proportions of the actual building follow those specified in the Ying zao fa shi. (7) This is a crucial difference.

A further complication of the Lu Ban Jing with reference to Beijing is that no Northern editions have yet been found and Liu Dunzhen specifically indicates that its value lies in its relation to Southern building.(8)

Whilst the Ying zao fa shi had real value as a manual whose measurements had been carefully worked out, the value of the Lu Ban Jing was fundamentally talismanic. The physiognomy and exorcistic sections may have had some use though since there are many other references to such practices, they may have been extremely well-known already. The rest probably served as a poor man's equivalent to the Ying zao fa shi, an indication that the building trade was a respectable one, sanctified by the existence of a classic. The Chinese respect for a little learning is legendary and there is no reason why the building trade should not have had its classic and hence its respectability.

The existence of this 'classic' may also indicate that within the building trade itself there was the same upward aspiration as can be found in houses. If the rich of Beijing used bracketing in defiance of sumptuary laws, it was to demonstrate their wealth and status, and the Lu Ban Jing hints at such dreams in its depiction of fabulous, multi-storeyed pavilions which were unlikely to fall to the lot of the ordinary builder. If they did, he would not find the Lu Ban Jing much help. The compiler of the Lu Ban Jing is described as 'Superintendent of the Imperial Artisans in the Ministry of Works (Peking Division)', an unlikely attribution but one which adds to the picture of a talismanic manual which conferred respectibility rather than imparting detailed knowledge.

Apart from this basic distinction between prescribed grand building and ordinary vernacular construction, there is a further separation in the unit used to determine proportion in grand building, part of the bracketing system. The cai (材) (the end elevation of the horizontal corbel bracket arm) was used as the base unit to establish proportion in

the Song Ying zao fa shi; [9] a very similar system was used under the Liao and it is assumed that the principle had its roots in Tang practise, if not earlier. [10] Though fashion in building subtly altered external appearance (gradually emphasising horizontal lines rather than vertical, and diminishing eaves curvature), [11] the principles upon which proportions were established within a building remained the same during the Ming and Qing. [12] During the Ming and Qing, however, sumptuary laws forbade the use of bracketing in ordinary houses. [13] Domestic architecture was thus separated from the system of planning which was characterised by determined proportions and regular timber sizes based on a system laid out in official building manuals.

There were exceptions to the rule that houses were not allowed brackets for those rich enough to build in the grand style did erect house and courtyard complexes with structural use of bracketing, creating a living area similar in plan and construction to temples and palaces.[14] Such houses therefore remove themselves from the general category of domestic building and place themselves in the category of grand, prescription-built constructions. Such avoidance of sumptuary regulations is found in other areas throughout Chinese history, in, for example, burial and tomb furniture [15] and only point to a fudging of delineation at the top of the economic and social scale. The vast majority of dwellings in the Beijing area in late traditional China have no bracketing and are therefore clearly separate from the grand style of building.

A similar group of buildings which fall very largely into the category of vernacular, unregulated building are shops. Whilst the hutongs of Beijing are lined with the concealing walls and occasional gates of hidden courtyard houses, the main streets are lined with shops. It has been shown that shops are constructionally close to houses but that for

obvious reasons such as public display and ease of access, have been turned outwards and have an open front to the street. (16) Despite this openness, the depth of privacy and concept of hierarchy in depth characteristic of domestic architecture is also revealed in shop plans. There are many accounts of customers being led from the front building of a shop into the courtyard behind and then to the private quarters of the shop-owner where special goods are offered, tea is served and the customer made to appreciate the privilege that has brought him into this more private domain. (17) Such penetration into the private depth of a shop is paralleled in accounts of gradual penetration into the increasingly private depths of a private house complex. (18)

Apart from openness to the street, another characteristic of shop as opposed to domestic architecture is external decoration. The simplest shop had only a decorated fascia-board but grander establishments had a pai lou set up across the front of the building, a separate and free-standing embellishment in front of the domestic-style building behind. (19) In shops, as with houses, it is at the top end of the economic scale that buildings were constructed with reference to building manuals and bracketing was used on the external pai lou. (20) Most shops, however, fell within the unregulated building type.

The second point made about average jian measurements in Beijing houses was that in the absence of written regulations, there was a concensus on desirable and practical dimensions which reveals itself in the relative uniformity of size. Essentially, size is relative but fairly uniform. Freedom from regulation could, in theory, release constraints and produce wildly varying types of house with varying dimensions. There are practical reasons which limit such possibilities. Mention has already been made of the layout of the imperial capital of Beijing which restricted plots of building land through its street plans and which

provided the orientation of buildings on the plots both through the street plan and the orientation of the city as a whole. A further practical restriction was the availability of timber. A two to three metre span was a convenient one and much wider spans would have been difficult to achieve without recourse to costly hardwoods.

The strongest force behind the relative uniformity of both size and style of construction was probably that of tradition, a feature which is considered to characterise vernacular architecture in other parts of the world. The strength of tradition does not mean that innovation and change were impossible or non-existant, rather that houses were built by those whose knowledge was received (often handed down from generation to generation) rather than acquired from books. Obviously many of the builders of palaces in China were, too, members of building families (21) but they had added resources in the form of official manuals which were not available to builders in the vernacular line. The received tradition meant that a house was built without plans but on instructions which related to site and materials. Details were left to the builder who would build a house like all the others surrounding it. (22) Segalers' description of the building process makes no mention of particular instructions, the plot-owner simply convened the builder, provided materials and equipment and specifications which referred only to the number of rooms required or the number of wings (according to family size and economics), leaving the builder to construct the house.

The only instructions were the following: "Le propriétaire indique au menuisier le nombre de chambres qu'il désire. Sa famille est grande et it veut que sa maison soit composée de plusieurs chambres et d'une salle extérieure. La chambre extérieure est toujours située au centre de la maison." (23)

The house as a constructional unit was so universally understood and so simple to make that, particularly in the countryside, it was not necessary to bring in specialist workers, as a peasant could build his own house without great difficulty. (24)

Though the plan and construction principles of the vernacular house in the Beijing area may be termed common knowledge, and though vernacular house-building was not governed by structural handbooks which institutionalised changes in fashion during different periods, (25) this does not mean that vernacular house-building was static or unvarying. (26) The houses measured show considerable variation in style from the flat-roofed H house with its fascia board (reminiscent of the design of the simple shop although less decorative) to the carved facade of the Z house (which recalls on a simpler scale the carved doors of the halls in the Forbidden City). Within the walled city of Wan ping (now part of greater Beijing municipality) the recently erected houses show an attractive variety of window lattice with designs that incorporate the double happiness character or the five-pointed star of the People's Liberation Army. There, too, chimneys which like those in other nearby villages have a cover in the form of a pavilion roof with upturned eaves, are also decorated with little birds in clay. Thus within one settlement there are both individual variations in decoration of the similar elements and decorations that are characteristic of the whole settlement. (27)

The vernacular house, an idea made concrete rather than a prescription carried out has strong affinities with grand buildings. Most writers on Chinese architecture stress the continuity of form, plan and progression in depth that is found throughout the whole spectrum of Chinese building. (28) As a superficial observation and on generalisation, this is accurate.

Since it has been demonstrated that there is a distinct break between the greater and lesser traditions in construction and method, it is important to clarify the observed connection with reference to the demonstrated separation.

Such buildings as the Forbidden City were constructed to contain imperial activities and thus included both halls for ceremonies as well as living quarters. As these were arranged in the same way as in an ordinary house in a progression from the external and ceremonial to the private depths, there was a clear parallel to be drawn. Since the Forbidden City was closed to the public, it is perhaps not the best example but parallels can be found in temple buildings where living quarters for the monks were at the back of the enclosure and the same sense of progress through halls and courts was felt. (29) Aside from the question of scale and the use of bracketing, such grand enclosures reflected exactly the smaller domestic enclosure and served as a model to be aspired to. (30) This aspiration is seen most clearly in those mansions which ignored the sumptuary regulations and used brackets in construction precisely because they brought the building closer to the model. (31)

In the same way, Beijing viewed from above shows the enclosed courtyards surrounding the great enclosure of the Forbidden City, revealing the continuity of design and the hierarchy of aspiration. This continuity is seen most clearly in roof treatment for many of the houses have small pitched roofs tiled with unglazed grey whilst the great pitched roofs of the Palace enclosure are also tiled but with the glazed yellow tiles reserved for imperial use. There, both the continuity of system and design are seen in the context of the sumptuary laws which effectively drew a barrier across what was otherwise a spectrum determined largely by economic status.

A summary discussion of the arguments relating to the use of standard dimensions in the design of the jian

The jian or bay is the normal measure for buildings in China: a house is always referred to by the number of jian in it and temples, too are described as being so many jian long. The reference is to width; the height and depth of the bay are not taken into consideration.

The technical usage has entered the language for, in Chinese, a determinative compound is always placed between a number and a noun and the traditional determinative for buildings, bays and rooms is jian (although zuo 座, the determinative for mountains, is now used for tall, western-style buildings).

In the case of grand buildings, it can be demonstrated that from the Song period (960-1279), if not earlier, the proportions of the jian were fixed according to prescriptions in the Ying zao fa shi and later official building manuals. The basic unit was the cai, the end elevation of the horizontal corbel bracket arm whose dimensions determined the size of all other members and consequently the size of the bays.

No equivalent handbook has yet been found for domestic building and, during the Qing (1644-1911), sumptuary regulations forbade the use of bracketing in domestic architecture, thus removing the possibility of legally using the cai as a determinant of proportion.

With no written prescription for proportion in domestic architecture, on the basis of the material assembled, it is demonstrated that the jian in late traditional domestic architecture in the Beijing area was roughly standardised at c.2. 5 metres. The relative uniformity of the span reflects an economic use of cheaper timber (which was not sold in standard sizes as it was in Japan) and a concensus on desirable proportions for domestic buildings.

Appendix One: Jian measurements

The H house: 2.43 m.

The W house: 2.I3 m.

The Z house: 2.47 m.

Five-jian house in the Beijing suburbs (near the airport)
2.43 m.

Li Jinghan : 2.6 - 3.7 m.

L. K. Tao : 2.6- 3.7 m.

Segers : 2.43 m.

References: Li Jinghan, p. 34.
L.K.Tao, p. I05.
Segers, p. 56.

Appendix Two: Lu Ban, the patron saint of carpenters

Lu Ban was worshipped by house-builders, carpenters of all sorts and masons and tile-workers which perhaps helped co-operation between their different guilds. There does not seem to have been much rivalry between these groups though this may also have been due to the separation of their interests as closely-related groups such as the mat-tent makers and awning workers were constantly in dispute (Burgess, p. 205).

There is, naturally, much uncertainty and contradiction in the accounts of the life of the legendary carpenter, Lu Ban. He is generally supposed to have been roughly contemporary with Confucius (Anne S. Goodrich, p. I42) and to have invented most of the carpenters' tools, founded the crafts of carpentry, boat-building, kite-making, and invented the wheel.

Doré considers that there may have been two separate persons who have been fused into one in the popular image. The first was Kong Shu zi (公輸子) who was born in the State of Lu, constructed palaces and boats and later ascended to heaven (Doré, vol. 2, p. I033). This man was venerated from the Ming and it is he that is described in the Lu Ban jing. The other Lu Ban was supposed to have been born in Gansu province. However, as Goodrich points out (p. I43), in the popular canon, Lu Ban is one person, generally assumed to be from the Shandong area, a master craftsman with magical powers who is still part of Chinese folklore and has been the subject of a film in the I950s (Rayns, p. F43-5).

During the campaign to criticise Lin Biao and Confucius in the early I970s, the Lu Ban controversy was re-opened in an article by Du Shu, 'Lu Ban, a skilled craftsman of ancient China'(I975) where Du Shu maintains that those who suggest that Lu Ban might have been

high-born (Kong Shu zi) are simply following the Confucian line, "only if you are born into the ruling class are you intelligent and wise; the working class are naturally stupid, fit only to be oppressed, to be slaves,"(p. I6). In the article, which seems to wish to dispel some of the myths about his birth, his mythical inventions are upheld; he is credited with the invention of a mechanically sealing tomb (sealing systems have been found in Ming tombs and sealing methods are reputed to have been used in the as yet unexcavated tomb of the Qin Emperor), the engraving of the earliest map on stone, the invention of the carpenter's square and plane, drill and ink-box. He made a wooden magpie, invented the grappling hook for sea battles and the siege ladder. His wife, invented the umbrella to protect carpenters from sun and rain that might spoil their garments (an invention that was disregarded by the nineteenth century carpenters of Beijing). Despite his having been born a contemporary of Confucius, he is credited with much of the building of Ming Beijing, taking a personal hand in correcting a disastrous inbalance in the roof curves of the Dong zhi gate (Due east gate) and providing the stones required for the base of the Xi bian gate (West gate) by addressing the stones in a river, turning them into sheep and cows and driving them into the city (Jin Shoushen).

The image of Lu Ban seems to have been very common in Chinese temples (and still exists in the Kennedy Town Lu Ban temple in Hong Kong, see Burkhardt, vol. 2, p. II7). Needham illustrates an effigy from Mai ji shan seen in I958 (vol. 4, part 3, pl. 756) and Goodrich shows his shrine in the west court of the Dong yue temple where he wears Taoist robes and four of his six attendants carry carpenters tools (p. 268 and pl. I8a). Fifteen tablets carved in his honour

were set up outside the shrine, though none were dated earlier than I793. Since the Dong yue temple was not the one in the south part of the city where the annual guild meetings were held, this particular shrine must have been maintained by local guild members.

A fairly recent representation from Hong Kong depicts Lu Ban with attendants carrying the two-handled saw and a mallet (Guang jiao jing, Wide-angle Magazine, 28, Jan. I6, I975, p. 45). Here he is called'Lu Gong shu' (魯公輸), reviving the controversy of dual character, (see also Eberhard,'Building magic', p. 58-9).

1. Huc, L'Empire chinoise, 3rd ed. vol. I, headings to Chapter I.

2. Bachelard, p. 24.

3. Through Ma Shiyi (马士沂), a deputy head of Beijing University Library, I was able to meet Chen Mingda (陈明大) in Beijing in May, 1983. I had substantially completed my thesis by that time and was rather nervous about meeting the greatest living authority on Chinese architectural history. He did not, however, tell me much that I did not know already, which was an affirmation and a relief, although he was able to clarify various important points. He is, above all, an expert on the history of building technology and has recently published books on wood-working techniques in the Ying zao fa shi and an analysis of the structure of the wooden pagoda at Ying xian which followed the design module specified in the Ying zao fa shi (see Bibliography).

4. Liu Dunzhen, Zhong guo zhu zhai gai shuo.

5. Liu Dunzhen, Zhong guo gu dai jian zhu shi.

6. Blaser, Courtyard house in China (sic).

7. Wang Qiming, Bei jing si he yuan.

8. I am grateful to Ma Shiyi for following the trail of the book and eventually, despairing of finding a copy in a library, finding the author herself. As a post-script to the search, one of Beijing's leading dissident poets, Bei Dao (北岛) offered to continue the search and discovered that the material was never published but was a collection of research notes and that though there was a copy in the National Library, it was not possible to see it.

9. These descriptions are based on personal observation and a survey of articles on regional forms in Jian zhu xue bao. 建筑学报 1957/3 p.51 1957/4 p33., 1957/12 p.10, 1962/7 p.10, 1962/9 p.4, 1962/10 p.12, 1964/8 p.14, 1981/9 p.29, 1981/11 p.54, 1983/1 p.27.

10. This was part of a general population expansion (see Chesneaux, Bastid and Bergere, p. 49) but the effect in cities was particularly

noticeable, see Lamson, p. I6I, Gamble, How Chinese families live in Peiping, p.94 , and L.K.Tao, p.

II. Examples include Fei-shi's Guide to Peking which concentrates on western-style edifices built by foreigners as early as I909, Jermyn Chi-hung Lynn (I928) and Kates, The years that were fat, p. I2I.

I2. The most notable was Liang Sicheng (梁思成) who studied architecture in Cornell, the University of Pennsylvania and Harvard Graduate School of Fine Arts (I924-8), returning to China to become Professor of Architecture at National North-eastern University (and later at Beijing University and Qinghua).

I3. Duncan, p. 38.

I4. Wang Daguan is now in his fifties. He has completed two very long handscrolls of Beijing in the I930s, one showing the city in winter, the other, the city in summer. The winter scroll is larger in scale. Both are painted in the traditional style in colour wash on silk and though not yet widely known they are due to be exhibited in the Mei shu guan in Beijing in July, I983. I am grateful to Hua Junwu for arranging the meeting. 王大观

I5. 张择端 , Qing ming shang he tu (清明上河图) in the Palace Museum, Beijing.

I6. Such as the Qian long nan xun tu (乾隆南巡图), part of which is illustrated on the cover of Jian zhu xue bao, I77, May, I983.

I7. Conversation with Chen Mingda, May, I983. I asked him about kang in Beijing since the literature was contradictory. Early account such as that of Ides, stress that the kang was an invariable fixture in northern houses. My own observations had led me to conclude that they are now only an 'invariable' fixture in the countryside around

the city and Chen confirmed this, demonstrating by the size of his study that a kang would have taken up far too much space to allow for bookcases and desks. He was vague about the date of its disappearance but agreed with Wang Daguan that it was probably in the 1930s.

Notes to Chapter I: Literary sources

I. Zhong guo ying zao xue shi hui kan

2. On the history of the Ying zao fa shi (II00), see Glahn, p. I32-5 and Chen Mingda, Ying zao fa shi da mu zuo yan jiu, p. 2-3. Chen mentions the I9I9 photolithographic reprint which caused a considerable stir, prompting Liang Sicheng to begin research into its contents and being publicised abroad by Yetts and Bushell.

3. Guo Daiheng and Xu Boan, p. 33.

4. Chen Mingda, Ying xian mu ta, p. 242.

5. Such guide books include the Du men ji lue which is almost exclusively a list of streets, wards and districts.

6. Liu Dunzhen, Zhong guo zhu zhai gai shuo.

7. Zhang Zhongyi et al.

8. Huc, vol. 2, p. I94.

9. Chambers (I757).

I0. Chambers, preface.

II. Staunton.

I2. Siren, The imperial palaces of Peking, vol. 3, pl. I76.

I3. Staunton, no. 29.

I4. Staunton, vol. I, p. 420.

I5. The tent theory was widespread in early nineteenth century writing on Chinese architecture. A representative argument occurs in the 'Description of the city of Canton' (Chinese repository, I833) which is quoted in full in note 5I to Chapter 4. The assumption that the Chinese used to live in tents (perhaps confusing them with nomadic Mongols) and that when they became sedentary they could only build along the lines of the tent with softly curving roofs, has no foundation. It follows an earlier phase in western writing on China and its architecture wherein links with other cultures are emphasised, most eccentrically by Dortous de Mairan who sought to demonstrate an Egyptian influence on China, mediated by ancient Greece (p. I73). He criticises Chambers for basing his conclusions about

Chinese architecture on the one city of Canton (p. I72), feeling that the size of China probably led to the concealment of certain missing links, "Mais y a-t-il a la Chine des pyramides telles qu'on voit a Rome, qui y ont ete apportees d'Egypte? Je n'en ai point vu, mais ce n'est pas une preuve qu'il n'y en ait point." (p. I69).

I6. Breton de la Martiniere.

I7. Thomas Allom and George N. Wright.

I8. Staunton, vol. 2, p. II8.

I9. Ch'ien Chung-shu, p. I50-I5I.

20. The Chinese traveller, p. I60.

2I. Chambers, p. 5-6.

22. Penny Cyclopaedia, vol. 7.

23. See plate opposite p. I69 in Ides where an accurately straight ridge terminates at the eaves in an amazing series of dolphins and serpents, quite inappropriate to the Forbidden City.

24. Bushell, vol. I, p. 45.

25. Summerson, 'Viollet-le-Duc and the rational point of view' in Heavenly Mansions, p. I4I.

26. Stein, 'Les jardins en miniature d'Extreme-Orient' in BEFEO, I942.

27. Pirazolli-t'Serstevens, p. II.

28. Boyd, p. 26 and p. 50; Paludan, p. 38.

29. Such as Le Corbusier's Modulor which includes a passage where he praises the Japanese tatami module which succeeded the jian module borrowed from China (p. 54).

30. See Dennis Sharp's introduction to Benton and Sharp, p. xxii.

3I. Charlotte Baden-Powell, p. 4I., and Architecture d'Aujourd'hui, 20I, Feb. I979, p. 74.

32. Hausmann, 'China: architecture for the people?' in AAQ, vol. I2, no. I.

33. Rapoport, p. 2I.

Notes to Chapter 2: Three houses

1. West, p. 17.

2. Hong Ye wrote essays on these gardens, see Hong Ye, p. 95, 107-111. Both Mi Wanzhong and He Shen have biographies in Hummel's Eminent Chinese of the Ch'ing period.

3. Guo Daiheng refers to the fact that jian always appear in odd numbers, partly because odd numbers were regarded as lucky and partly because if the central jian is used as an entrance or hallway, balance on either side of the axis is preserved, 'Zhong guo gu dai mu gou jian zhu', p. 23.

In smaller houses, however, jian do not invariably appear in odd numbers, for the east and west wings in small courtyards are apparently not uncommonly two jian. The major, northern wing is, however, invariably made up of an odd number of jian.

4. Owl's tails, chi wei (鸱尾) in their simplest form are very common in Beijing houses. They clearly indicate the same functions of decoration and protection that are fulfilled by the elaborate animal ridge acroteria found on temple and palace buildings throughout the country.

The owl's tail is just a prologation of the roof ridge and the same form is found on Han tomb models (Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 51). By the Northern Wei, it is clear that ridge acroteria had begun to diversify considerably (Fu Xinian, 'Guan yu "Zhan zi qian 'You chun tu'" nian dai de tan tao', p. 49). Guo Daiheng discusses the magical significance of the form, p. 36.

5. For 'ear rooms' er fang (耳房), see Li Jiarui, p. 399 and the description of Li Dazhao's house in Bei jing jie dao de gu shi, p. 40. In the same volume, Lu Xun's house near the Bai ta si is

described; his small extension, off the back of the north wing was not an ear room but called the 'tiger's tail' hu wei (虎尾).

6. Panorama of Peking (I879), p. 36-7.

7. Such re-building and addition is remarkably common. Beijing residents often state that the four-sided enclosure is no longer visible in Beijing as it has been filled in with additional rooms and lean-tos.

8. The double-roofed profile could be seen in many of the shops on the east side of Liu li chang before the street was demolished in I979.

9. Bredon, map facing p. 374 and p. I8, and Lin Yutang, p. I5 (he uses the terms 'inner' and 'outer' instead of 'Tartar' and 'Chinese').

Notes to Chapter 3 : The Construction process

1. Gamble, How Chinese families live in Peiping..., p. 124.

2. Li Jinghan, p. 34.

3. Ching Ho; a sociological analysis..., p. 83.

4. Though it is difficult to gather any specific information on the amount of government-owned land outside the Banner lands and villa properties outside Beijing, the decrease is implied in Chen Shao-kwan, p. 54-55.

5. Yoshinobu Shiba, 'Ningpo and its hinterland' in Skinner, p. 418.

6. L.K.Tao, p. 108 and Gamble, How Chinese families live in Peiping p. 140.

7. Gamble, How Chinese families live..., p. 126-7.

8. G.W.Skinner, 'Urban social structure in Qing China' in Skinner, p. 537, and the work to which he refers, F.W.Mote.

9. Swallow, p. 17.

10. Harold Acton, who rented, "a perfect Chinese mansion with three successive courtyards and a side garden... off the street named after Dr. Morrison, the famous Times correspondent", was somewhat embarassed by the presence of his landlord, " a decrepit Manchu noble, riddled with debt,who vegetated in an out-house with his opium paraphernalia." Acton, p. 362.

11. Swallow, op. cit. Many landlords would include the words ji fang zhao zu (吉房招租), 'I announce a lucky house for rent', since it was difficult to rent a haunted house as there was a belief that the spirit or ghost of a suicide, murder victim or someone who had suffered an untimely death, was imprisoned in the place where the event had taken place and could only escape when the appointed time for death was reached and that these spirits had a bad effect on those who subsequently lived in the house. Swallow lists various unlucky houses such as the one in Handkerchief Lane where the wife of the owner had died of grief

on her husband's taking a concubine against her wishes. No tenants would take the house and the caretaker was found dead, kneeling by the stove with a "look of extreme terror on his face" (p. I25). In a house near the Xi si pai lou (in north-western Beijing), a young wife, constantly ill-treated by her mother-in-law, had taken her revenge by swallowing a quantity of matches and dying. The house remained empty until a tailer took it, attracted by the very low rent. Unfortunately, one of his apprentices was found eating matches in the middle of the night. Though he was stopped before he had eaten too many, the tailor moved out and the house was filled with a gang of men employed in watering the streets who suddenly began to fight among themselves for no reason. Finally, a carpenter was persuaded to take the property but he suddenly ran amok with his axe, attacking anyone he saw (p. I26). In a medicine shop near the Cai shi kou (菜市口), 'vegetable market', the euphemistically named execution ground in the south-west part of the city, an apprentice was woken in the middle of the night and asked for some powder to prevent bleeding. He asked how much was needed and was told, "As much as you have." When he opened the door to hand over the medicine, he found a decapitated man standing with his head in his hand. The apprentice died of shock and, whilst there is no mention of rental problems, the shop never dealt with enquiries after closing time again. (p. I26).

I2. Gamble, How Chinese families live..., p. I28.

I3. Shiba in Skinner, p. 4I8.

I4. Doolittle, p. 467.

I5. Doolittle, p. 467.

I6. The revenue from the land tax accounted for about two-thirds

of total government revenue before the Taiping rebellion. Shiba in Skinner, p. 419.

17. Shiba in Skinner, p. 419.

18. Gamble, A social survey..., p. 74.

19. The question of the sale of land in the countryside during the Ming and Qing is covered in Chugoku tochi keiyaku monjo-shu (Kin-Shin), which comprises a collection of land-sale contracts from various parts of China including Hebei province, very close to Beijing (p. II), but no city land contracts. In the countryside, great attention was paid to the delineation of the area of land in question and this must have been a considerable problem in cities as well where the density of building and ubiquity of party walls must have led to problems. There are later works on land acquisition and the law written by missionaries in order to help others build missions without infringing Chinese regulations, Hoang, 1915.

On the problem of land tenure within cities, see S. van der Sprenkel, where the problem once posed is immediately dropped for lack of material.

20. Because of its unusual nature, this transaction was exempted from the mourning regulations following the death of the Xian Feng emperor (1862), which required that seals be stamped in blue rather than the usual red, Rennie, vol. 2, p. 117.

21. Rennie, vol. I, p. 24.

22. Rennie, vol. 2, p. 116-7.

23. A 'house tax' was initiated in 1917 (Gamble, How Chinese families live..., p. 190-2) by the police and was intended to provide extra funds for the police force. The tax was supposedly levied according to the rentable value of a house but it seems to have been rather arbitrarily fixed and was collected in some confusion. In 1931, the rates were re-calculated according to the type of roof (which had

a bearing on rent since the same categories of roof covering were recognised in rent, see L.K.Tao, p. 104), providing three classes: two-storied, one-storied tiled roof or one-storied flat roof. A children's rhyme from Beijing about the life of a policeman stresses the collection of house tax as one of the major tasks, "...Three, what is three? He carries a big bag to collect the house rent (sic)... Five, what is five? If he doesn't hand over the rent he'll be taken to the police-station... Nine,what is nine? Being a policeman is no better than being a dog which watches the street...", Kinchen Johnson, vol. I., p. 87-88.

24. Manchu nobles were exempted, being required to pay only 4½% and the deed for the property in these cases being drawn up on special red paper. Gamble, Social survey, p. 74.

25. Gamble, Social survey, p. 74. This method recalls the detailed descriptions of the boundaries in Chugoku tochi keiyaku monjo-shu . The account has been based on Gamble, Social survey , p. 74-5 and Needham, vol. 4, part 3, p. 74.

26. Rennie, vol. 2, p. 106. Rennie tells of a man who used the proximity of the Roman Catholic mission as a pretext for pulling down his house in order to re-build it. He claimed that he had the foreigners' permission and, "The authorities, hearing this, did not like further to interfere and allowed the work to continue", vol I, p. 153). However, when it was discovered that he did not have the Jesuits' permission, he was jailed. It was, by contrast, possible for the authorities to order the demolition of a house as a punitive measure as when a Chinese Christian proposed to let a foreigner into his house to watch the emperor's cortege pass, he was threatened with denunciation by his neighbours, banishment and having his house pulled down (Rennie, vol. 2, p. 109).

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Aside from land transactions, the Municipal Council of Beijing under the Republic, enjoyed the right of 'eminent domain' which was normally only used in "the improvement of communication and the development of markets". (Gamble, Social survey, p. 75). In such cases, reparation was made to the dispossessed house-owners, not on the basis of market value but on a special scale related to the size of each room and the quality of materials used.

27. Shiba in Skinner, p. 420.

28. Shiba, loc. et op. cit.

29. Swallow, p. 49.

30. Segers , p. 53. Though the book was published in 1932, Segers bases his account on observations made in 1916 in Hebei province. On seasonal construction, see also Liu Dunzhen, Zhong guo zhu zhai gai shuo, p. 28.

Building in the countryside was also carried out at these times, though attention had to be paid to sowing and harvest, not only because it would be difficult to find labour at such times but also because wages were lower in slack agricultural seasons, Segers , p. 53 and Li Jinghan (p. 28) who states that on the outskirts of Beijing, carpenters and tile-makers were out of work for the four winter months every year. Cameron and Brake have a photograph of a man mending his roof, p. 90.

31. Liu Dunzhen, Zhong guo zhu zhai gai shuo, p. 29.

32. Eberhard, 'Chinese building magic' in Eberhard, p. 51.

33. Segers , p. 54-5 where he displays a certain contempt for the foremen.

34. Segers , p. 55.

35. Gamble, Social survey, p. 97, where he states that the grey colour is the result of throwing water into the kiln at the last moment. Eder (note on p. 56), quotes Kelling who says that the bricks used in Beijing

are thinner and more brittle than normal bricks.

Though everyone who sees the grey brick houses of the city is struck by the uniformity of colour in Beijing, I have, as yet, seen only one explanation (given by Keller, quoted in Eder, p. 56) which is that red should be avoided as a dangerous colour since it attracts fire. Bricks fired in an oxydising atmosphere would be reddish but the reducing atmosphere in the kilns producing the bricks used in Beijing produces grey bricks. Many houses in Beijing have their walls painted grey to maintain the desired colour.

Another aspect of the limitation of colour is the suptuary restriction which allowed coloured tiles on palaces and temples but not on ordinary houses (Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 313).

36. Segers , p. 55 and Rennie, vol. I, p. 223, where he describes the foreman in far more flattering terms than Segers ; the man was known in the Legation as Ariel as he wandered about with a measuring rod in his hand.

37. Segers , p. 55.

38. Rennie, vol. I, p. 223.

39. A ligature. I have simply translated the French word although the technical sense in which it is used here has no equivalent in English. In the Grand Larousse, it is defined as "Monnaie qui était en usage en Chine et en Indochine et qui valait 600 sapèques". The small coins had a hole in the middle and were threaded together on a string, hence the name.

40. Segers , p. 56.

41. Burgess, p. 56. The rates listed by Burgess were only those decided at the annual meeting of the guild and, given the high rate of inflation at the time, must have altered frequently.

42. Both Segers and Rennie talk of the amount of money taken by

the head or foreman before paying his labourers. Rennie states that he was paid one dollar per five labourers by Her Majesty's Government but that he paid varying rates to the craftsmen and labourers. They all received the same food, however, for which he also deducted a sum (Rennie, vol. I, p. 223). Segers suggests that it was done on a fairly systematic basis, deducting about a third of the money paid by the proprietor (Segers , p. 56).

43. Segers , p. 56.

44. Rennie, vol. I, p. 234.

45. Rennie, vol. I, p. 27.

46. Rennie, vol. I, p. 27.

47. Segers , p. 58, where he discusses the problem of mealtimes from the point of view of the contractor. He suggests that it was better to have the main meal at mid-day because it filled them up and the only needed some millet gruel in the evening. He says that if the main meal were to be fixed for the evening, it would be necessary to provide two full meals a day of a pound of meat, a pound of grain and vegetables. During the mid-day meal, the workmen could drink as much spirits as they wished but if they spent the afternoon on the kang rather than on site, their pay would be docked. The workers on the British Legation site were not given free spirits.

48. Rennie, vol. I, p. 234. Though it was the practice of the workmen on the British Legation site to eat pork with bread once a

fortnight, the meat meal was discontinued when prices rose and the contractor felt he could no longer afford it so the ordinary ration was issued without variety. (Rennie, vol. 2, p. 49.)

49. Rennie, vol. I, p. 234.

50. It is likely that the luxuries the workmen offered themselves were pickles and cloves of garlic to spice the meals a little. It is still common in canteens in Beijing to see eaters produce jam-jars of home-made pickle or chilli sauce or munch garlic cloves brought along in their pockets.

51. The siesta is the norm in China today, for all except shop workers. In Beijing it is an hour in winter but extended to two hours or more during the hot summer months.

52. Rennie, vol. I p. 200.

53. Rennie discusses rain twice, first when he sees the workmen's failure to appear for work with the first rains of the year in May as a sort of annual holiday (vol. I, p. 137) and then giving the workmen's reasons for not working in rain, (vol. I, p. 150).

54. Rennie, vol. I, p. 221-222. The wooden slips sound like the system of wooden tallies used in bicycle parks in Beijing today.

55. Lu Ban was worshipped by house-builders and is an important figure in the popular pantheon, see Appendix Two.

56. Burgess, p. 92.

57. Burgess, p. 91. The separation of the furniture-makers into a separate guild organisation may be later than Ming since the second section of the Lu Ban jing illustrates carpentry work and furniture construction. This mixture apppears in the earliest extant editions which are mostly late Ming.

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58. Burgess, p. 92.

59. The headquarters of the guild and annual meeting place was the Qing zhong miao (清忠庙), 'Temple of refined loyalty' in the Southern city, Burgess, p. 91.

60. The fees for the year 1925 are given in Burgess, with the total income from subscriptions, p. 97.

61. The six areas included five within the city limits and one outside, Haidian (海淀) which was the main supply post for the Summer Palace and, owing to the number of country villas and estates in the area, must have been a place where there was plenty of work, Burgess, p. 94 and Nagel's Encyclopaedic Guide: China, p. 586-7.

62. Burgess, p. 93. The guild had its own cemetery.

63. Burgess, p. 92.

64. Rennie, vol. I, p. 264, vol. 2, p. 8 and vol. I, p. 204-5 where he says that all the workmen would normally do on the eve of the festival would be go to theatres, carry out devotions and eat.

65. Segers, p. 57.

66. The variety of tasks executed concurrently may be seen in illustrations of building works which range from rather grand constructions like that depicted in chapter 33 of the Qin ding shu jing tu shuo (1905) which is supposed to represent the construction of the eastern capital of the Zhou. The late Qing illustration shows work on the roof, laying tiles on a mud and lime base and the laying of a pavement. These two types of work fall into the categories supposedly laid out in Yu Hao's Mu jing (木经) or 'Classic of carpentry' (an early Song work that is no longer extant) where he talks of 'upper' and 'lower' work. The same thing on a much smaller scale can be seen in the section of the Lu Ban jing

where workers are shown measuring planks, preparatory to sawing them whilst others chisel untrimmed tree trunks.

67. Segers, p. 58.

68. Yuan da du de kan cha he fa jue (Excavation and investigation of the Yuan capital), p. 23, where three types of pillar base are distinguished in two very fine excavated house floors. The two houses, comprising moon-viewing platforms and multi-courtyard layout, are better than those under consideration and the variety of pillar bases is probably greater than would be encountered in a smaller house. The three types of pillar base are all undecorated and comprise those that are external and visible, made of stone with a shallow depression in the centre, those that are hidden within the walls and consist of simple flat stones and a third type which appear to have supported the pillars of a trellised walkway and have semi-circular indentations.

69. The use of bricks or mud walls is and was a cheaper method of building since the north of China has been gradually deforested. The problem is raised in Dickinson, p. II.

70. Segers, p. 57.

71. Segers, p. 58.

72. Segers, p. 58.

73. In better houses, a stone floor was not unusual but wooden floors were not common in Beijing, except in shops. They existed in Sichuan (Dye, p. 15). Rennie describes the reaction of Prince Kong (biography in Hummel, p. 380-4) to the carpet in the British Legation which "particularly attracted his attention, and he casually observed that there was not the same objection to stone floors in the north of China that there was in the south, the damp of the former being of an altogether different and less noxious kind" (vol. I, p. 66).

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Though an aristocrat like Prince Kong might be used to stone floors (and immune to their coldness which Sir John Addis remembered as the most significant feature of Chinese domestic architecture), floors in the north were more often made of beaten earth or brick (Needham, vol. 4, part 4, p. I34.).

It seems that the earth floor could be useful to a family since Hommel records the fact that saltpetre manufacturers were prepared to buy the surface layers of mud floors which had become charged with nitrates over the years (p. 280). Dickinson also mentions the fact that kang in the area between Beijing and Tianjin were broken up and re-made every five or six years, the debris being used as fertiliser as the clay had been absorbing useful chemicals from the smoke (Dickinson, p. I2).

74. The Tai shan stone was also used in Beijing at the end of blind alleys, perhaps because evil spirits might lurk there, unable to get out (Mrs. J. G. Cormack, p. 250). The use of such stones was evidently very widespread since it is mentioned by Needham who spent the longest period of his stay in China in Sichuan (Vol. 4, part 2, p. 45) and by Doré whose researches were conducted primarily in the Shanghai area, "La première pierre d'une construction importante est taillée d'avance et on y grave les caractères T'ai shan" (Manuel des superstitions, p. 89). This is perhaps the place to mention Eberhard's work on building magic which he bases on two main sources: a collection of folk-tales from Zhejiang and his own translation of part of the Lu Ban jing. The two parts of his article are contradictory and the evidence that he presents in the first part (on Zhejiang province) is morbid in the extreme, suggesting that building a house in the prov-

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ince meant almost certain disaster since all his stories recount the disasters that overtook families after workmen had walled up a variety of objects in the walls of the house. Perhaps builders in the Shanghai area and further north were less vindictive or house-owners were more generous with meals and pay, but many of Eberhard's findings are directly contradicted by Doré's and also by the Lu Ban jing itself, which Eberhard uses himself. In the latter, and in Doré, the ratio of good-luck charms to evil spells is about fifty:fifty which would seem reasonable. It may be that superstitions did vary enormously from province to province for Eberhard states that (in Zhejiang), the placing of a coin or a figure of a cat in the walls will cause noise at night (which is undesirable),(p. 57), whilst Segers says that placing a coin in the foundations brings luck (and Doré concurs, p. 91). Similarly, Eberhard states (p. 56) that walling up noodles or dumplings will bring noises at night, whereas the Lu Ban jing as he quotes it, says they will bring wealth (p. 60.). It may be that regional variations explain the differences between Segers' account of building practices in the North and Eberhard's account of Zhejiang but in his essay the lack of balance is such that it seems more dubious.

75. Needham (vol. 4, part 2, p. 45) where he refers to juan 3 of the Lu Ban jing, Ye shan feng, Shanghai, 1908.

76. The Chinese word jian denotes the space between two columns and is thus often translated as 'room' but it is quite possible to find a three jian building with one, two or three rooms since the internal divisions can be varied. In general, where there are internal divisions, they follow the columns.

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77. Liu Dunzhen, Zhong guo zhu zhai gai shuo, p. 27.

78. Liu Dunzhen, Zhong guo zhu zhai gai shuo, p. 27-8 where he discusses the range of roof forms found in North China. The range is still clearly visible in Beijing.

79. Dickinson, p. II.

80. Hommel, p. 284.

81. Segers , p. 57.

82. Clearly illustrated in both the Ming edition (Harvard-Yenching Institute)and the Shanghai reprint.

83. Hommel, p. 240.

84. Hommel, p. 245 and Lu Ban jing, juan I, where a carpenter is depicted using the knife.

85. I saw such a marker that had been made for his own use by a carpenter in the Sha shi yu (沙石峪) production brigade, Hebei province, in 1971. It was not as professional-looking a marker as that illustrated by Hommel (p. 251) and was not made out of bamboo which is a southern material, but out of little scraps of wood, with a square inkwell. The handle which wound the string was made of a bent nail. The carpenter was very proud of his machine, confident that such did not exist in England and that British carpenters would not make their own tools as he did.

86. Hommel, p. 251, and the marker can be see in many of the illustrations to the first section of the Lu Ban jing.

87. Hommel, p. 251-2.

88. Dye, p. 16.

89. Hommel, p. 245-6 and first section of the Lu Ban jing.

90. Hommel, p. 255, Lu Ban jing, first section and Gamble, Social survey, p. 97.

91. Hommel, p. 234 and Lu Ban jing, first section.

92. Hommel, p. 241-244. Some of the harder woods occasionally used in building were too hard to be planed so a special instrument was used to smooth them (Hommel p. 245-6) which consisted of up to twenty blades fixed to a handle. The tool was used away from the body. The blades were forced into grooves cut against the grain and the cutting edges were bevelled.

93. Hommel, p. 250. The chisel and hammer were used for making mortises and tenons, Hommel, p. 284.

94. Segers, p. 55.

95. Hommel, p. 246-7.

96. Hommel, p. 249.

97. Hommel, p. 279, described southern Chinese pillar bases as consisting of two stones, one the base and the other set on top, bearing a depression to receive the column.

98. Hommel, p. 284 and Needham, vol. 4, part 3, p. 767 where he shows the roof section of a small gate-house standing on the ground ready to be raised into position.

99. Hommel, p. 284.

100. Hommel, p. 284.

101. This is called yi mian po (一面坡), a 'one-sided slope', see Liu Dunzhen, Zhong guo zhu zhai gai shuo, p. 27.

102. There is an almost infinite variety of roof treatment still visible in Beijing. The components are the same: grey mud mixed with lime, either serving as a bed for the tiles or as the roof surface itself; grey unglazed tiles of two types, one slightly curved, the other semic-cylindrical. These, together with a variety of decorated tiles, circular end-tiles impressed with tao tie (饕餮)masks, dragons or lucky characters or triangular drainage tiles (sometimes glazed, also often impressed with the same designs), were used in many different ways.

Sometimes, only part of a roof is tiled, the rest smooth grey mud and lime. Sometimes, a couch of the flatter tiles was then covered with a layer of the smooth grey mud and lime. Alternatively there were two main ways of laying the tiles, either (as in the W house), alternating semi-cylindrical with flatter tiles or alternating rows of the flatter tiles, with alternate rows raised on thicker couches of grey mud so that the effect was almost that of semi-cylindrical tiles.
One of the best places for looking at roofs is along the road that passes Bai ta si (白塔寺) in the north of the city.

The treatment of the roof was important since it was reflected in rental values. For purposes of rent assessment, roofs were divided into tiled, lime-roofed, part-tile, part-lime, with sometimes the extra category of flat roof (in descending order of value, see L.K.Tao, p. 104 and Li Jinghan, p. 36). A double-pitched roof was valued more highly than a flat roof.

Duncan also includes 'western-style' buildings in his section on rental values. Both the date (1933) and the fact that these commanded the highest rents are interesting.

103. Liu Dunzhen, Zhong guo zhu zhai gai shuo, p. 27 et seq.
In the north, in Jilin province, the reed layer may be 10 cms. thick whereas in He'nan and Hebei it is only 5 or 6 cm., thus the height of the eaves varies considerably.

104. As in the Z house and some former shops in Haidian and Qinghe (清河) villages, north west of the city.

in Hebei province, Zhao xian (赵县 zhu zhai gai shuo, pl. 52, a house in Hebei province, Zhao xian (赵县).

106. Many outhouses in Beijing University demonstrate this and also the tiles of the W house.

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I07. Hommel, p. 270-274.

I08. This atmosphere may have been achieved in the same way as that of the brick firings, where water was thrown in at the end of firing to colour the bricks grey by reduction.

I09. Eder, p. 60.

II0. Observation made when comparing the W house with, for example that of Lu Xun, near the Bai ta se.

III. The W and Z houses.

II2. Eder, p. 60.

II3. The Z house. Hommel mentions the apparent disappearance of decorated (moulded)tiles which had been common in the Han and obviously later since he found quite a few examples that had been incorporated into later buildings (p. 268). In Beijing, moulded decoration was restricted to the end tiles (either circular like those of the Han, or the triangular drainage tiles). These bear a variety of good-luck emblems. Some of the designs have a considerable history (like the tao tie). and it does not seem that their production was much interrupted as Hommel found elsewhere.

II4. Seen in the Si ji qing Commune (四季青人民公社) which adjoins the Summer Palace, on the north-western edge of Beijing, also in the walled town of Wan ping, on the road to Zhou kou dian (周口店), south-west of the city.

It was not uncommon for bricks and tiles to be re-used. During demolition, workmen can still be seen carefully removing tiles and sliding them down planks to the ground where they are piled up. Bricks can easily be dislodged since the native concrete of mud mixed with lime crumbles away without affecting the bricks at all. One afternoon of 'manual labour' at the Languages Institute in Beijing, I975, consisted of demolishing a small gate-house. The bricks seemed to

be hardly attached at all and almost all of them could be re-used.

II5. Gamble, Social survey, p. 97 and Hommel, p. 264 where he he describes a kiln which is admittedly far from Beijing (in Zhejiang), but the technique is the same as that mentioned by Gamble.

II6. Hommel, p. 264.

II7. Hommel, p. 260-263.

II8. Rennie states that the bricks were smoothed with a plane-like implement until they were " as smooth as the finest Maltese stone" (vol. I, p. 246), and afterwards rubbed with a polishing stone like a hone.

II9. See the Z house.

I20. Though glass is better for seeing through than paper, the inhabitants of the H house said that after they had replaced their window-paper with glass panes in the I930s, they immediately regretted the decision which had been made on the basis of fashion and keeping up with modern improvements and with no thought of insulation. Glass windows made the house much colder in winter as they conducted heat more effectively. In summer, the interior was stuffy as the glass could not be removed as the paper used to be in the summer.

It was common to replace all the paper in the windows as Chinese New Year and in some parts of North China the custom persists with the added decoration of painted window paper or paper-cuts pasted up for the festival (this is especially common still in Shanxi province around Da tong). Paper panes could, of course, be repaired or replaced whenever necessary.

I2I. Rennie, vol. 2, p. 83.

I22. Hommel, p. 302.

I23. See drawings.

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I24. Cressey, p. I72 and also the photograph facing p. 72 in Sowerby's 'Famine and flood control in China'(I934) which is described as 'A Fare in progress outside Li-chuan in Shensi where the articles offered for sale are Rafters, roof-poles, doors, windows and household furniture all stripped from dwellings in famine to buy a little food'.

I25. Dye, p. I6.

I26. Dye, p. I6-I7.

I27. Dye, p. I7.

I28. For both types of hinging, see Hommel, p. 297-30I.

I29. Hommel, p. 299 amd plates 442-5.

I30. Hommel, pl. 444.

I3I. Hommel, pl. 445.

I32. This is a feature remarked upon by many travellers in rural China and forms part of the People's Liberation Army's 'Eight points for attention and Three rules of discipline' which include the instruction to replace all doors after they have been used (for temporary beds).

I33. Padlocking is still a very common method of securing doors and chests in China. Even in new buildings such as the Languages Institute and Beijing University, doors have no locks or catches so that the only way to secure them from outside was to padlock them. Old traditional Chinese padlocks are no longer to be found in Beijing but they can be bought in rural areas (and Taiwan). For illustrations see Ecke, p. 64, 68.

I34. Dye remarks that in Sichuan, other colours were also applied, mainly as surface decoration around the windows. He mentions gold and black. This outlining of the windows recalls the painted decoration of doors and window-frames near Xi'an where the woodwork is painted black and outlined with a thin red line, see Juliano, inset, pl. on p. 3I.

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I35. Hommel, p. 252. It is interesting to note that this method is now used, in a slightly different way, to achieve "a soft, mottled effect", see Maureen Walker,'Baths of glory', p. 23.

I36. tong oil (桐油) is made from the seeds of Aleurites cordata a tree which is widely grown in Central China because of the oil. It has large, slightly sparse leaves and a large flower like that of a chestnut, but again, rather sparse and spread out.(See Liu Yuanfu).

The method of treating woodwork which is described by Rennie, is essentially the same today. Over a period of a few weeks, I wateched the process of restoration of paintwork on the small kiosk just outside the northern-most gate of the Forbidden City. The process of scraping the columns clean to the wood, oiling, washing, binding with the sticky mixture of hemp and clay, was exactly as he described.

The inhabitant of the W house was interested in the restoration process and was very pleased when some of his woodwork was treated in a similar way and painted with a mixture which included pig's blood (an ingredient also used in the Suzhou area and no doubt elsewhere, see Liu Dunzhen, Su zhou gu dian yuan lin, p.36.)

I37. Rennie, vol. I, p. 96-7. Since I am quoting, I have left his romanisation of 'Tung' although this should read either t'ung (Wade-Giles) or tong (pinyin).

I38. This can still be seen all over North China as well as in the rural areas around Beijing.

I39. Rennie, vol. I., p. 228. He states that the most popular paper was that with a "satin pattern" which did not come in rolls but in small squares, about ten inches by twelve. He was impressed with the dexterity with which the paperer on the ground would cover the paper with paste and then throw it up to his partner on a ladder who stuck

it to the wall. In the same passage, Rennie describes other acrobatic methods used by Chinese builders.

I40. Eder, p. 59.

I4I. Eder, p. 60. He states that the roof ridge itself bears flower patterns in cut-brick and that the middle section is always open. Though this form is common enough further south, I have only seen it once in B eijing, in domestic architecture, on a roof on the road leading east from Qian men wai da jie (前门外大街) to Niu jie (牛街), where an open-work tile with arabic characters was set in the centre of the ridge. near the moslem quarter of Beijing. This type of broken ridge seems to me to be unusual, the more common form being the unbroken, undecorated ridge.

I42. The same form is found in the W house though this does not have any cut-brick. This may have been for economic reasons but also since the house was within the grounds of a garden (now the University), it required less decoration than an external pilaster, and fewer lucky symbols since it was within a protective enclosure.

I43. Eder, p. 59, where he states that the flower basket is a symbol of Lan Caihe (藍采和), one of the eight Taoist immportals. Werner in his essay on the immortals says that Lan was believed to be either a woman or a hermaphrodite or a man who did not know how to be a man, p. 345-6.

I44. The swastika is a Buddhist symbol of great antiquity; in cut-brick work it is often found mixed with flowers on the sides of pil asters. The mystic knot is glossed by Eder as the luck-bringing symbol on the soles of Buddha's feet and also a symbol of his Holy Bowels (p. 59) but Soothill glosses it as Visnu's lucky curl as well as one of the auspicious symbols on the feet (p. 203).

Fine examples of the flower basket and swastika can be seen on gateways in Nan chi zi (南池子) and cutbrick is also widely

found in tombs, see, for example,'He nan wu zhi xian....'.

Notes to Chapter 4: Development of the main features of the courtyard house

I. I have already mentioned the dominance of the courtyard form throughout China (in the Introduction). It is not universal as there are farmhouses, particularly in Sichuan, around the city of Chengdu, which are L-shaped in plan but even this form, with its open space in front of the house, protected by the side wing, tends towards the courtyard and towards enclosure.

Linda F. Sullivan is of the opinion that the "townhouse complex plan... is... by no means the most common (structure) of all domestic architecture, but rather represents the house of the affluent." (p.I32.) I do not altogether agree, though she does not go into sufficient detail to be sure quite what she means by "townhouse courtyard complex plan". If her intention is to isloate the multi-courtyard complex inhabited by one family, then it is quite clear that this was the house form of the affluent. Princess Der Ling states, with little insight into the life of any but Manchu royalty, that her home, "like all Chinese houses in Peking, was built in a very rambling fashion and,with gardens, covered about ten acres of ground... it had sixteen small houses, one storey high, containing about one hundred and seventy-five rooms arranged in quadrangles facing the courtyard which went to make up the whole..." (p.5).

The point about the courtyard plan is that in its simplest form, it is almost universal.

2. Gardiner, p. 8.

3. There are many examples of such isolated farm-house models among the Han tomb models in museums in Europe and China. A particularly fine collection is in the Sichuan Provincial Museum in Chengdu. See also The genius of China, p. I2I.

Notes to Chapter 4: Development of the main features..

4. Juliano, p. 32. John Black photographed such walled enclosures, very similar to Han tomb models, near Dunhuang, in the I940s and they can still be seen from the train.

5. See Ishiwara's volume of photographs of walled cities in China (taken during the Anti-Japanese War). It is interesting to note that the earliest examples of domestic architecture unearthed in China, such as the settlement at Banpo and at Cheng zi yai, consist of free-standing units enclosed within a defensive wall or ditch, protecting the community rather than individual property. Han towns acted in the same way but outlying farms presumably relied upon their own walls for protection, see Chang Kwang-chih, p. 97 and I28.

6. The original quotation comes from the Autumn waters chapter of the Zhuang zi, see Zhuang zi zuan jian, p. I28. The use of the phrase to refer to women can be found in A.H.Smith, p. 262 and Croll, chapter 2.

7. See, for example, Cao Xueqin's Hong lou meng and a later novel, Ba Jin's Family, also The Golden casket, p. I09.

8. Jin Shoushen, p. I28-I32.

9. Liu Dunzhen, Zhong guo zhu zhai gai shuo; the theme of continuity runs through the monograph.

I0. 'Bei jing hou ying fang Yuan dai ju zhu yi zhi'.

II. One of the earlier sites where southern orientation can be shown to be almost universal is that of Banpo where nearly all the houses have a south-facing entrance, see Xi'an Ban po, p. 9 and 25. The continuing use of southern orientation can be traced through the Shang and Han, see Zhong guo jian zhu jian shi, p. 23 and 4I and through later periods, see Liu Dunzhen, Zhong guo zhu zhai gai shuo.

I2 Liu Dunzhen, Su zhou gu dian yuan lin, p. 38 to 40 and pls. 5/2I3-2I6, illustrates this point which is under-emphasised in, for

example, Kates' Chinese household furniture where the plates all illustrate single items.

I3. For Korean interiors, see Nomura, p. 72-3 and for Japanese, Nihon no minka, vol. 5, p. 48 and II7 and vol. 7, p. 43. Both show a decided asymmetry in contrast with Chinese symmetry.

I4. Xi'an ban po, p. 307-8 and Zhong guo jian zhu jian shi, p. 44 93 and succeeding chapters.

I5. The most obvious example of brick vaulting still standing is the wu liang dian (无梁殿)'beamless brick hall', the main hall of the Lingu temple outside Nanjing, see Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 400-40I. Some writers suggest that the timber shortage began as early as the Qin, see Adshead, p. 2I et seq.

I6. Ito, p. 55. I have also watched repairs and demolition in Beijing when all removable parts of the house from tiles to window-frames and timbers are carefully preserved for re-use.

I7. Needham, vol. 4, part 4, p. 9I.

I8. Engel, p. 357-8.

I9. Discussion with Robin Spence of Cambridge University School of architecture and Ulrich Haussman.

20. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. I43, I47, I50, I56. and Hui zhou Ming dai zhu zhai p.19

2I. See Chapter 3: The construction process.

22. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. I97-8, 200.

23. Huc, vol. 2, p. I94. Though this is true of Beijing's major streets, the city was contradictory in that the hutong or lanes were very closely set. A late I9th century Chinese guidebook written for short-stay visitors to the city says that the streets and alleys of the outer city are as tiny as tiny as cow's hairs or silken threads, (Zeng bu) Du men ji lue

24. Huc, vol. 2, p. I95.

25. R.F.Johnston, p. I28.

26. H.G.H.Nelson, p. II4 and H.D.R.Baker, p. 2I.

27. The term 'wave gable' bo lang shi (波浪式) appears in an article which touches on various types of southern gable or flank walls, He Yeju, p. 4I.

28. Sir Robert Matthew, p. I33.

29. Liu Zhiping, p. 394, top right-hand corner. I have seen this form in Yunnan and Sichuan.

30. Nelson, p. II4.

3I The terms 'stepped gable' is used to cover two Chinese terms, pin zi shi(品字式)' in the shape of the character pin' and ti ji shi (梯级式), 'stepped gable' used in He Yeju, p. 4I. The difference between them is that the pin zi shi has only three horizontals, the ti ji shi, more, a distinction which is not really necessary here.

32, For illustrations of the form in Anhui, see Zhang Zhongyi et al., p. I6 and Cahill, p. I6-I7; in Hunan, see He Yeju, pls. 46-7, p. 40; in Jiangxi, see Jing gang shan ge ming li shi jian zhu he ji nian xing jian zhu, pl. 2.

33. The tian jing (天井) or 'heaven well' name for the narrow roof opening of southern courtyards must derive from the Zhuang zi picture of the frog in a well whose only view of the world is the patch of sky above his well, the same story as the one that is used to describe women's narrow and restricted view, see A.H. Smith, p. 262 and note 6. to this chapter.

34. This type of construction is described in great detail in Zhang Zhongyi et al. I have seen many late Qing buildings in the Jing gang mountains in Jiangxi with a shallow pool under the 'heaven well' and

a cool, mossy interior court. The same plan (with shallow pool, sometimes with fish), can be found in Anhui, on Jiu hua mountain and in Sichuan in the older houses in Chengdu, described by Ren Xiaoping and in Cheng Cheng, p. 27-30.

35. Bao Tianxiao, p. 45. His main source is the Suzhou area.

36. Zhang Zhongyi et al., figs. 6,7,8,10, 12 et seq.

37. A house under construction on the road to the Shi lin (石林) Stone forest, outside Kunming in 1981 (and finished in 1983), was two-storeyed, as were most of the others in the area, the upper storey a rudimentary, open area, used for storage (also reminiscent of that illustrated in Cahill, p. 18.)

38. Charles Taylor, p. 91.

39. Ernst Boerschmann, Chinese architecture and its relationship to Chinese culture, p. 559.

40. A.B.Freeman-Mitford, p. 61.

41. Qi Rushan, p. 28. The lowness of such upper storeys may be gathered from Gamble, (Peking: a social survey, p. 75) where he notes that for tax purposes, they were only counted as half a jian. Qi Rushan states that they were not really allowed in Beijing (p. 28) but the fact that very skimpy ones were registered for taxation suggests that if they either belonged to those rich enough not to care or were so low as to be uncomfortable for anything except storage, they could pass. Their smallness and lowness recall Taylor's description (p. 91) and that of Morse, p. 33. An illustration of a low upper storey to a grand Beijing house can be found in Thomson's Illustrations of China and its people, vol. 4, pl. 12, which depicts Mr Yang, "a rich merchant" of Beijing (and the ladies of his house who are crowded onto the small upper balcony whilst Mr Yang sits below with his son.)

The question of the spread and history of multi-storeyed buildings in China is a complex one and one that does not really affect the

Notes to Chapter 4:Development of the main features

study of the predominantly single-storeyed housing of late imperial Beijing. The historical questions revolve around the Shang oracle bone character for gao (高) or 'high, tall' and early representations of tall buildings on reliefs and in Han models which all point to multi-storeyed buildings both for defence and display. Gernet describes multi-storeyed building in I2th century Hangzhou (p. II4-5). Though physical remains are lacking, the persistence of multi-storeyed building south of the Yangtse (and in the west and northwest) suggest that in some areas this has a considerable history.

42. Zhang Zhongyi et al., for multi-storeyed housing in Anhui. Sarah Allen has shown me a considerable number of slides of domestic architecture in Taiwan. Some of the houses in Penghu (澎湖) illustrate this form. See also'Traditional Chinese building in Taiwan', p. 33.

43. For example, Lin Lin, plates between p. I0 and II.

45. For example the buildings at the Du Fu cao tang (杜甫草堂) outside Chengdu and the temple complex at Guan Xian (灌县) and also Baber, p. 9.

46. Cahill, p. I8.

47. He Yeju, pl. 34.

48. The most recent work is Liu Dunzhen, ed., Su zhou gu dian yuan lin I979, but earlier books on the subject include Tong Jun and Powell.

49. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 3I9.

50. Huc, vol 2, p. 194.

51. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 3I9.

52. One of the earliest expositions of the tent theory is to be found in the 'Description of the city of Canton'(I833), "It is generally supposed that the remote ancestors of this nation, in their migration eastward, dwelt in tents: their circumstances would require such habitations: and when they became stationary, their wants would prompt them to seek some more sunstahtial covering from the heat and storms. But the tent was the only model before them: and that they imitated it,

their houses and pagodas, built at the present day, afford abundant proof. The roof, concave on the upper side, and the verandah, with its slender columns, show most distinctly the original features of the tent. In fact, the whole fabric of ordinary buildings is light and slender, retaining the outline of primeval simplicity. Those therefore who seek here for grand and stately edifices, built after Grecian and Gothic models, will seek in vain."(p. 194). The southern-ness of this description is important.

52a. Liu Dunzhen, Su zhou gu dian yuan lin, p. 28-9.

53. I have slides of simple ventilation holes in Beijing and near Luoyang, made from roof tiles, and also more elaborate cut-brick versions from near Zhengzhou.

54. Eder. These flower-basket designs can be found all over Beijing but the best preserved group is along Nan chi zi and Bei chi zi, to the east of the Forbidden City.

55. Nei Meng gu gu jian zhu, p. 5.

56. Personal observation, especially in the city of Xi'an.

57. Nei meng gu gu jian zhu, p. 5.

58. Personal observation in the Xi'an and Luoyang area.

59. Compare the plans of, for example, Suzhou house-garden complexes in Liu Dunzhen, Su zhou gu dian yuan lin, p. 414-5, 450, 479 with Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 316.

60. Mei Lanfang, vol. I, p. 211 and vol. 2, p. 90.

61. Shan Shiyuan, map opposite p. 160, for example.

62. Mei Lanfang, vol. I, p. 211.

63. See Eitel and De Groot, Religious system of China, vol 3, book I, Disposal of the dead, part 3, The grave, and Feuchtwang.

64. Needham, vol. 4, part I, p. 242 et seq.

65. See, for example, Ching Ho: a sociological analysis and Dickinson.

66. Liu Dunzhen, Zhong guo zhu zhai gai shuo, p. 41

67. Zhang Yuhuan, p. 38 and (on the imperial use of the axis), Peffer, p. 594.

68. Martin Yang, A Chinese village, p. 85.

69. Stephan Feuchtwang is of the opinion that secondary burial is the most important indicator of geomantic practice. Gamble mentions it in his study of Ting Hsien, saying only that "some" families practised secondary burial but it does not seem to have been common practice in the north of China. (p. 393).

70. On the geomantic question of the site of the capital, see Farmer, p. 41. For the Ming tombs, see De Groot, col. 3, book I, p. 950.

72. P'eng Tso-chih, p. 80. An English translation is given in Meyer, p. 56.

73. Meyer, p. 147 et seq.

74. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 278. and'Jing shi wu cheng fang hang hu tong ji ba', postface, p. I.

75. Hou Renzhi and Jin Tao, Beijing shi hua, p. 67.

76. Marco Polo, The Travels, transl. R. Latham, p. 128-9. The possibility that Marco Polo never visited China, which has been raised by Mongolists, is not relevant for it is likely that even if he never saw the place himself, he based the account on guide-books, possibly in Persian. The arguments against his having been in China rest on the use of names as he uses Persian forms for all city names and om issions relating to customs rather than physical description.

77. Farmer, p. 41.

78. Chen Cheng-siang, p. 6-8.

79. The first European to notice the faulty alignment of Beijing was Gaubil in 1763, see Gaubil, p. 716. Needham explains that after approximately 1050 A.D., the magnetic needle showed a declination towards

the west, so that cities or portions of city wall built after that time are to the west of the meridian. This may explain why the villages of the North China plain, seen from the air, whilst roughly oriented southwards, do not show a uniformity of orientation that most writing on Chinese city planning would lead us to expect. Needham, vol 4, part I, p. 28I et seq.

80. Wang Biwen, Yuan da du cheng fang kao, p. 73.

8I. Zhang Henshui, p. 4. The translation is taken from Perry Link (p. 36) as it seemed superfluous to re-translate.

82. Mei Lanfang, vol. I, p. 2II.

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1. Lao She, p. 139-140.

2. Mei Lanfang, vol. 2, p. 90.

3. Princess Der Ling, p.5.

4. It has been established that the joint family living in one large compound was more of a myth than a reality in late imperial China (Lang, p. 15); the myth partly fuelled by novels such as Hong lou meng. That it was particularly mythical in North China is demonstrated by Hui-chen Wang Liu (p. 13) and Gamble and Tao's social surveys which revealed that in the Beijing area in the early 20th century, the average family consisted of only five members living together (Gamble, How Chinese families live... , p. 21 and Tao, Livelihood in Peking, p. 42.).

5. I have not been able to find a copy of this in London. Parts of it are reproduced in Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 285 and there is an account of the map and its editions in H-S.Ch'en and G.N.Kates, p. 2.

6. The question is discussed at length in Zhou Ruchang. However, as Minford has pointed out, the absolute siting of the house, though interesting, is not essential to an understanding of the novel. Nor is it essential to an understanding of the grandest sort of traditional domestic architecture for very much the same reasons. Cao Xueqin's description is so detailed and so closely reflects the ideal mansion that the identification of the original is almost unnecessary (Cao Xueqin translated by Minford, vol. 4, p. 17). There is a very complete description of the mansion and garden in 1940 (when it housed Furen University) by Ch'en and Kates; for a similar, though even grander mansion, see Pu Hong, p. 226-233.

7. In an essay, Cao Xue qin zhi jia de yi chu yuan zhai shi tan (On a garden mansion of Cao Xueqin's family), included as an appendix to Zhou Ruchang, Xu Gongshi reaches this conclusion (p. I37). It is not essential to this argument but the life of Cao Xueqin, whose family and personal fortunes compelled very frequent changes of address and often drastic changes of life-style, epitomised by varying housing conditions, recalls that of Harold Acton's landlord (p. 362). It is interesting in the case of Cao for his description of the idealised extended family also included description of the idealised extended mansion in which the family lived, an ideal that his family eventually failed to maintain (see his biography in Hummel).

8. Ida Pruitt, Old Madam Yin, p. 74. Her statement is borne out by Beijing informants such as Zhang Fengtong, now of the Linguistics Department, Sichuan University.

It is apparently widely believed by non-Chinese that women should inhabit the western wing. I can find no conclusive evidence to support this as a general rule, though it is the case in the Hong lou meng. Chen Mingda considered that it was by no means a rule. The association of women with the west may be connected with the legendary figure Xi wang mu (西王母),'the Queen mother of the West' (Werner, p. I63-4 and Williams, p. I93). Preference for certain positions within the house such as the north-eastern bedroom for the master, was ignored by many. Lu Xun, who could have chosen to occupy that room, did not.

9. Mei Lanfang, vol. I, p. 2II.

IO. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 3I3, where it is stated that such 'hanging flower gates' chui hua men (垂花门) might replace plainer structures within a courtyard complex, behind the main gate, leading to back courtyards. The implication is that they were found in multi-courtyard mansions rather than simple houses.

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II. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 313 and accompanying illustration, fig. 167-I.

12. Noticing a reference in one of Lu Xun's essays, Chen Mingda had been searching for years for a copy of Huo shi jia xun (霍氏家训). When I visited him in the company of Ma Shiyi, Ma volunteered to look for it in Beijing University library. He finally found a copy (based on the late Ming manuscript) in Han jie lou mi ji. This contains the Huo family instructions which are much simpler than, for example, the Yan shi jia xun (Yen Chih-t'ui, translated by Teng Ssu-yu). Huo's rules consist mainly of lists indicating who should obey whom but the volume also contains the map of his house with the nan jie (男街) and nu jie (女街) clearly marked. In general, since each hall could be entered from the main southern door and a subordinate northern door, men entered from the south and women from the north, from the more private, back part of the house. Men also used the main axis whilst women were restricted to a narrow corridor which ran round the house and along the north wall. It is interesting to note, in the light of the difficulty of establishing whether or not the western wing was reserved for women, that this rule-bound patriarch did not recognise the west as the 'female' wing, on the contrary, women could walk along their narrow corridors on the east as well as the west and female guests were lodged immediately north-east of the main axis and women members of the family could meet their brothers in rooms to the east of the house.

Chen Mingda is convinced that this was the first time that a map of a house had been drawn. He also stated that he believed that women were freer before the Ming when this map was drawn.

Huo Weiai was a southerner, a Cantonese, who served as an official

under the Zhengde emperor of the Ming. The house is a southern one since the courtyard spaces are labelled tian jing (天井) 'heaven well' and the main entrance is on the southern axis. Though it was a southern house, it is likely that his rules had their counterparts in northern mansions.

I3. Pruitt, Old Madam Yin, p. 34, Yang, p. 39, fig. 7, and Baker, p. 86 and 94.

I4. See, for example, Favier, p. 460. Bao Tianxiao makes it clear that this public usage of the front part of the house was even more extended in Suzhou where handicraft workers sometimes set up shop in the front gate of a large house (p. 46). Informants in Beijing state that this distancing is still the case amongst high-cadre families who still occupy courtyard houses. First visits are usually restricted to conversation at the main gate but eventually, a visitor may be allowed into the first courtyard and subsequently, when established as an old friend, will be allowed into the back apartments. Bill Hillier discussed theories of depth in settlements and compounds at a seminar, Durand and the Beaux Arts approach (July I978, Wates House) where he argued that differentiation in depth reveals social, economic and religions relationships.

I5. Hugh Baker often refers to the belief that evil spirits can only fly in straight lines and could thus be barred by a spirit wall. The motive of concealment is stressed in Zhang Yuhuan (p. 38-40) and Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 3I3, where the superstitious aspect is ignored. Tsuneharu Ito suggests a development from a purely superstitious motive to that of concealment (p. 7I).

I6. Pruitt, Old Madam Yin, p. 38-9.

I7. Dillingham and Chang, p. II3.

I8. Ida Pruitt, A daughter of Han, p. 2I, Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 3I3. Interestingly, in Manchuria, kang were

not always set against the south wall, as shown in Liu Dunzhen, Zhong guo zhu zhai gai shuo, p. 3I.

I9. Dickinson, p. I2.

20. Dickinson, p. I2. Needham comments on the amount of straw in the bricks of a kang he was sleeping on which consequently caught fire and smouldered all night, vol. 4, part 4, p. I34.

2I. I have slept on a kang with the flue from the cooking stove running through the wall and under the bed in a village in the mountains not far from Beijing, Sha shi yu (沙石峪). As it was August, it was not the best time to appreciate the heating potential and I had to put all my quilts underneath me. Chen Mingda commented that the most neat and attractive kang arrangements with stove are to be found in the Northwest and some of the caves Mao Zedong stayed in at Yan'an illustrate this. In one cave, the kang is against the south wall with its beautiful arched lattice and the cooking stove is immediately next to it. Nearer Beijing, the stove or stoves are usually in the central jian or outside, thus they are separated from the kang by a wall, as in Sha shi yu.

22. The oil-cloth covers are particularly popular in Da tong (大同) and the Yan'an area where they are usually black or red and painted with phoenix, deer and other reba or double happiness characters. They can be bought in the market at Da tong for about 30 yuan (May, I983).

23. Adam, p. I6, " Les femmes et les filles sont toujours assises sur ce k'ang. Quand les marchands de gateaux rotis ou de gateaux en torsade arrivent, les achats se font toujours par la fenetre."

24. Kates, Chinese household furniture, p. 44-6, pls. 6I-67.

25. The Le shou tang (乐寿堂), 'Hall of happiness in longevity' is an example. The polished wooden benches which line the hall are kang- height and furnished with the appropriate furniture. This may

be an example of Manchu taste since the Manchus originated in an area where rooms had more kang, (almost all round the room) than in Beijing and where the kang must have been even more vital to comfort than in the capital. See Summer Palace, p. 47.

26. Ides, p. 54-5.

27. Long-term residents who agree that kang used to be more common include Professor Wu Liangyong of the Faculty of Architecture at Qinghua University, and Chen Mingda. See also L.K.Tao, p. 106, and Rennie who writes of, "the ordinary fixture of a cangue" (vol. 2, p. 82). His spelling which recalls the punishment board (rather like a personal version of the stocks) hung round the neck of prisoners, makes the fixture sound rather serious. More recent arrivals in the city, such as the inhabitant of the H house (a German ex-priest) were under the impression that kang had never existed within the city.

28. Dickinson, p. 12, and conversation with Chen Mingda.

29. Chen Mingda indicated that his own study which contained a large desk, innumerable book-cases and tables piled with books and journals, as well as a sofa and arm-chairs for visitors, could no longer tolerate a kang which would have taken up about half the floor space. In Wang Daguan's winter scroll, there is a scene where a new wife is arriving at her husband's house, accompanied by her western-style furniture which includes western beds to replace the kang and enormous wardrobes. The old furniture, a pile of elegant low tables and high chairs in dark wood lies discarded in another courtyard. His painting helps to date the beginning of the mass removal of kang to the 1930s.

30. Complaints about the coldness of Beijing houses are legion. Sir John Addis' main comment on the domestic architecture of the region was that it left him with very cold feet, though Rennie quotes Prince

Kong as saying that bare floors were quite all right, vol. I, p. 66.

31. Ida Pruitt, Old Madam Yin, p. 36 . The H house had outdoor stoves and these are extremely common in Beijing. In Liu Dunzhen, Zhong guo gu dai jian zhu shi (p. 313), kitchens and latrines are mentioned as usually being set in side courtyards towards the back of houses. Bao Tianxiao states that in Suzhou, kitchens were near the back gate, p. 43.

32. Ito Tsuneharu (p. 76), says that latrines were rare in private houses though public latrines were very common, as they still are. He noted that there were plans to provide mains drainage in Beijing but this is still only partially available.

33. Conversation with Chen Mingda. Ito Tsuneharu, p. 75.

34. Cao Xueqin, trans. Gladys and Xianyi Yang, vol. I, chapters 16-17.

35. For a rather unsuccessful wrangle over neighbouring plots in Beijing, see FO. 228/1929: To and from miscellaneous, Jan.-June, 1915, the numbered series of letters from Mr. Wrentmore. Also, though the system of land acquisition is not mentioned, Fu Xinian, 'Recollection of a Beijing garden' where the garden is constructed on a narrow plot alongside the house which suggest that it could have been separately acquired.

36. On the three essentials of a southern garden, water, rocks and buildings (in that order), see Liu Dunzhen, Su zhou gu dian yuan lin , p. 15-43. On the comparative difficulty of reproducing these in Beijing, see Fu Xinian, p. 13.

37. Jin Shoushen, p. 130.

38. Ito Tsuneharu, p. 32. Chen Mingda said that the paper was of good quality and coated with tong oil.

39. The sober and restricted colour scheme of southern garden-house buildings is described in Liu Dunzhen, Su zhou gu dian yuan lin

p. 36-8 and may be compared with the richer colours used in northern gardens like the Pearl Spring and the Black Tiger Spring in Ji'nan, Shandong. It is noted in Liu Dunzhen, Zhong guo gu dai jian zhu shi p. 313, that coloured decoration in the courtyard houses of Beijing but that gui zu fu (贵族府), aristocratic mansions, had bright red doors with gilt decorations and that the covered walks and hanging flower gates within were brightly painted, like the long gallery in the Summer Palace. Siren illustrates some of these aristocratic mansions in The imperial palaces of Peking, (pls. 272, 236 and 263). In pl. 272, the garden in the centre of the courtyard is carefully tended and the decoratively painted buildings would have provided colour in winter in a way that was not necessary in the warmer south.

40. Loti, p. 279. Whilst the city of Beijing as a whole struck visitors in very different ways, some remarking upon the filth, others upon the splendour (of the palaces and temples at least) the description of trees and verdure is a universal feature of late 19th and early 20th century travel writing on Beijing. R.J.L.McGhee entered by the An ding gate, "A vast prospect of the town stretches before us, but the number of trees scattered through all the buildings makes it look more like the 'rus in urbe' than anything I have ever seen before."(p. 296). He continues, "Not but that I much prefer London to Peking but I quite agree with Ruskin that our modern architecture requires great improvement. In the courtyards of the houses, trees are planted, a weeping ash or two, or a large elm-like timber tree and these overshadowing the roofs of the house and partly concealing them, add much to the appearance of the city." An anonymous 'student-interpreter' wrote, "Looking down (from the city wall) into the city in summer, very little was to be seen of the houses, so thickly are trees planted about them. Indeed, Peking

might seem to be a green wood surrounded by a high wall... Nothing can be seen of the squalor and dirt of the streets and houses." Where Chineses drive: English student life at Peking by a student-interpreter, p. 243.

41. Graham, p. 207-8, where she describes the grape vines which never flowered as their owner refused to make the recommended sacrifices of two foxes.

42. Conversation with Chen Mingda.

43. Tun Li-ch'en (transl. Bodde), p. 51-2. The best description of a courtyard in summer with its temporary mat-shed is in Ann Bridge, Peking Picnic, p. 26-7. See also Rennie, vol. I, p. 223-4. For the largest mat-shed in Tianjin, see H. Wright, 'A giant mat-shed in Tientsin', p. 39.

44. Both Chen Mingda and Wang Daguan automatically divided houses into three categories in discussion. The same division is found in Bei jing gu jian zhu. The categories are not altogether identical: Bei jing gu jian zhu lists the Gong wang fu as a 'large house' (大型住宅), the Ban mu yuan (Half-acre garden) as a 'large to middle-sized house with garden' (大中型住宅花园), the houses in Bei chi zi and near the Peace Hotel as 'middle-sized' (中型住宅), and Lu Xun's house as 'small' (小型住宅). Chen took the Sichuan restaurant as large and otherwise used the same examples; Wang used Song Qingling's mansion as his large example, togethef with the Gong wang fu, the Sichuan restaurant as middle-sized and Lu Xun's house as small. If the middle-sized category is sub-divided, then it is clear that Chen was deliberately excluding the fu, which I would also do (as in my concluding chapter), since on grounds of construction, they fall into a separate category. Nevertheless, I

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include the Gong wang fu here as it represents the peak of housing and the height of aspiration.

45. This house, which lies near the Back Lakes in Beijing, is depicted in Wang Daguan's winter scroll, where he pointed it out as an example. There is a very sketchy description in Chen Rinong. The mansion used to belong to Prince Zai Feng 载沣, father of the last emperor Pu Yi 溥仪. Song Qingling lived there from 1963 but inhabited a new two-storey house (of the usual monastic simplicity) in the extensive grounds.

46. On constructional grounds; see concluding chapter and note 44 above.

47. See note 44 above.

48. Bei jing gu jian zhu p. 157 and p. 150.

49. 下中农 'lower middle peasant' in Chinese political terminology.

50. 半亩园 Half-acre garden, see Van Hecken and Grootaers and illustrations in Linqing, vol. 3, part I.

51. Illustrated in Blaser, p. 32-8. This was rumoured to have been Yuan Shikai's house but I cannot verify the claim.

52. Blaser, p. 32.

53. Van Hecken and Grootaers, map facing p. 384.

54. Blaser, p. 37.

55. 北池子 Bei chi zi runs along the eastern wall of the Forbidden City.

56. Three courtyards viewed from the Peace Hotel are described in chapter 2.

57. 白塔寺 Bai ta si, a landmark in the form of a dagoba.

58. Zhou Shachen, p. 246-8.

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59. This point was discussed by Chen Mingda. He said that it was not unusual for side wings in small house to be two *jian* rather than three.

60. Zhou Shachen, p. 246.

61. This possibility was never raised by any of the authorities.

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I. This flexible jian may be contrasted with the rigidity of the ken in Japanese domestic architecture. The influence of Chinese architecture on Japan may have begun rather vaguely in the 3rd century but was most significant during and after the reign of the Empress Suiko (593-628 A.D.) (Paine and Soper, p. I72.). The use of post and beam structure, already established in China, may have been antedated by a native system (Engel, p. 55) but it seems likely that before the introduction of the tatami mat in the I6th century, the concept of the ken or jian came from China (Futagawa and Itoh, p. I5). Before this shift in management of size from roof structure to floor, the Japanese ken was an absolute and rigid measurement in contrast to the varying jian sizes in Chinese domestic architecture. Qccording to Itoh, in different localities in Japan, the ken was a different length (the kyo-ma ken was 6. 5 feet and used in the capital, the inaka-ma ken was 6 feet and used elsewhere) so that timbers were sold ready-cut in the standard sizes in the different areas (p. I4-I5). If the jian system was imported from China, there are two possible explanations for this standardisation. One is that in domestic as well as grand architecture, the Japanese followed building manuals whilst in China, buildings were separated by the use or non-use of manuals (and were therefore standard or non-standard). Alternatively, it may be that an imported system is used with less flexibility than a native development. The archaeologist Xia Nai (夏鼐), discussing the relationship of Cantonese to the Northern Chinese dialects rejected the idea that it was like Pennsylvania Dutch, preserved by settlers and hence not developing organically, and stated that he

considered that the people of South China were physically a separate group from those of the north and had learnt Chinese as a foreign language. Since it was strange to them, it did not progress naturally as it did in the north but retained archaic features. Perhaps the Japanese, having learnt a system, stuck rigidly to it and did not allow flexibility of ken sizes.

2. The earliest surviving example is the Ying zao fa shi but later equivalents survive from the Qing, see Malone, p. 234-243.

3. Zhong guo jian zhu shi, part I, p. 352.

4. The most recent exposition was Ruitenbeek's paper at the EACS conference in Cambridge, July 1982, A Chinese carpenter's manual of the 16th century: the Lu Ban jing. Ruitenbeek's argument was that the manual was a practical one but his exposition concentrated entirely on the geomantic aspects and since the editions that survive are all southern, both aspects set the argument outside the discussion of northern house-building, at least in the persisting lack of strong evidence for reliance on geomancy in the Beijing area.

5. Lu Ban jing: Cambridge texts in the history of Chinese science on microfiche. See Appendix Two on the Lu Ban legend. Needham's texts are Qing in date. Liu Dunzhen has written two separate essays on earlier editions of the Lu Ban jing, editions which are fragmentary and both Ming in date which he tried to link with the more complete Qing editions which are fairly numerous. In both essays, he has stressed the southern origins of the earlier editions, thus, though he is intent on demonstrating the relevance of the text to domestic architecture, he is aware of the possible restrictions, (Liu Dunzhen,'Lu Ban ying zao zheng shi (1962) and 'Ming Lu Ban ying zao zheng shi chao ben jiao du ji (1937)).

6. Li Xueqin in conversation recalling his experiences in the country-

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side near Beijing.

7. Chen Mingda, Ying xian mu ta.

8. Liu Dunzhen,'Ming Lu Ban ying zao....', p. I64.

9. Needham, vol. 4, part 3, p. 68.

I0. Needham, vol. 4, part 3, p. 68.

II. See, for example, Boyd, figs. I0 and I4.

I2. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 278 and Sickman and Soper and Boyd where the Ming and Qing are invariably treated together.

I3. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 3I3.

I4. Liu Dunzhen, Zhong guo gu dai jian zhu shi, p. 3I3.

I5. Mahler, p. I3I.

I6. Liang Sicheng, p. 98 et seq.

I7. A.B.Freeman-Mitford, p. I24-5.

I8. As in Ida Pruitt's account in Old Madam Yin, p. II, 2I-46.

I9. Liang Sicheng, p. I99, Pierre Loti, p. 96 and 'Description of the city of Peking', p. 436.

Liang Sicheng's division of shops into those that have a fascia-board and those that have a free-standing pai lou (牌楼) in front to support advertising and decoration, is reminiscent of Venturi's articles on shop building in America where the more exptreme examples have imitated the wares for sale. Chinese shops of the simpler kind fall into his "decorated box" category, (Venturi and Scott Brown, p. 48-9).

20. Liang Sicheng, p. 98, I99.

2I. Hou Renzhi refers to Lei Fa-ta of the I7th century who established'a dynasty of court architects which carried on for seven

generations". The Lei family designed some of the major buildings in the Yuan ming yuan (圆明园)'Old summer palace', and the Yi he yuan (颐和园)'Summer Palace' as well as restoring the capital's water conduits (Peking: a historical sketch, p. 35).

22. The same method was used in Yugoslavia, see Rapoport, p.5.

23. Seghers, p. 56.

24. This is still the case in the countryside and on the outskirts of Beijing. I watched co-operative building in Wan ping, beside the Marco Polo bridge in the summer of 1976. A house was constructed in little more than a day.

This system of building within tradition and without recourse to experts has been described by Rapoport as "vernacular". Where building forms are understood by all and where, in theory, anyone could build his own house (though in practice building was often carried out by specialists who shared the common knowledge but possessed a greater degree of experience), the building process is described as"vernacular". Rapoport describes house-building in Yugoslavia where the plot was pegged to demonstrate the size of the required building but no further specifications were made for both the builder and potential occupier understood "a self-evident accepted model" (Rapoport, p. 5). Rapoport's description of vernacular building as separate from the grand tradition in that it has no manuals to preseribe form, fits the system of house-building in late traditional Beijing (Rapoport, p. 2).

25. In Zhong guo jian zhu shi, part I, p. 352, there are a couple of models illustrated to demonstrate the use of models in domestic architecture but their scale and the multi-courtyard layout suggest that these were at least mansions (fu), closer in design and conception to the palaces and temples of the grand tradition.

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26. Rapoport points out that change in the vernacular meant change in individual examples rather than the type (p. 4).

27. This can be seen most spectacularly in the walled village of Wan ping by the Marco Polo bridge (宛平), and in the villages on the road to the Tan zhe si (潭柘寺)(Temple of the pool and zhe tree), southwest of the city.

28. Paludan, p. 37-45 and Boyd, p. 49.

29. As in the Bai ma si (白马寺)(White horse temple), outside Luoyang.

30. In works emphasising the importance of the vernacular, the relationship with the grand tradition is rather played down (Rapoport, p. 10) but some writers, such as Redfield, consider that the vernacular must be seen in the context of the grand tradition and that both are replenished by each other (p. 68-9, 71). In Chinese domestic architecture, the original requirements of the grand and smaller scale were similar and eventually, the upper levels of vernacular architecture drew greatly on the grand tradition.

31. Guo Daiheng, p. 34 and Siren's illustrations of princely mansions, pls. 256, 263, et seq.

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