

THE APPLICATION OF TRADITIONAL DESIGN PRINCIPLES TO CONTEMPORARY HOUSING IN MALAYSIA

By

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Abstract

Malaysia is now undergoing rapid economic development, bringing swift and often drastic changes to the built environment. Major cultural changes, the effects of which may not be fully appreciated for a number of years, have also accompanied development. As "modern" construction techniques displace traditional methods, aspects of an intrinsically Malaysian way of life may be lost forever, for vernacular construction has evolved to provide a setting for the intimate and delicate intertwining of social environment with built environment.

This thesis examines the traditional Malay settlement, the kampong, and presents an application of observed principles in a design for a contemporary housing development. Descriptions are drawn largely from personal observation, and are given in terms of the cultural-physical interrelationship whenever applicable. Attention is given to the transformations which have occurred as the kampong (a traditionally rural form) has been introduced to the urban context.

A hypothetical housing development in Kuala Lumpur, Malaysia's largest city, illustrates the adaptation of traditional ideas and methodologies to the modern urban setting. For the sake of economics, as well as for the betterment of the environment, the role of the architect is confined to providing an infrastructure, leaving infill to the residents. Typical units are designed however, to serve as suggestions to the occupants and builders. It is intended that the thesis itself will offer further ideas.

Thesis Supervisor: Tunney F. Lee, Professor of Architecture and Urban Planning

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to Wan Abidin and Michael Lindfield for field assistance and good cheer,
to Hingman Chan for her constructive cynicism

But my deepest gratitude goes to Michael.

"The true basis for any serious study of the art of architecture still lies in those indigenous, more humble buildings everywhere that are to architecture what folklore is to literature or folk song to music and with which academic architects were seldom concerned... These many folk structures are of the soil, natural. Though often slight, their virtue is intimately related to environment and to the heart-life of the people. Functions are usually truthfully conceived and rendered invariably with natural feeling. Results are often beautiful and always instructive."

Frank Lloyd Wright, The Sovereignty of the Individual, 1910.

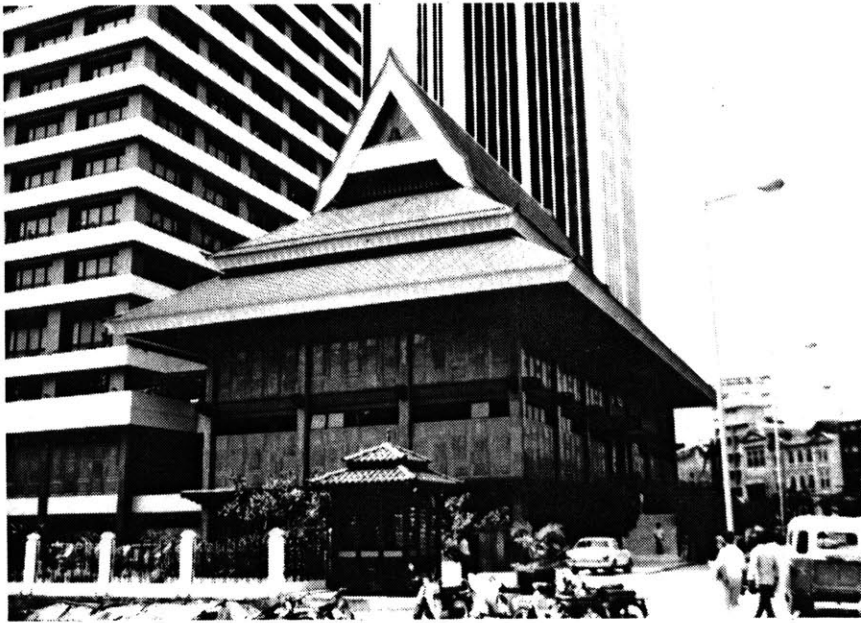
INTRODUCTION

The Age of European Colonialism created a complex and often confusing cultural admixture. On the one hand, the new location necessitated certain adaptations on the part of the Europeans. These adaptations were aimed primarily at maintaining their previous manner of living within altered circumstances and in terms of building, usually consisted of styles imitative of those of the homeland, with provisions made for such things as climate and defense. Similarly, there was often a move among the upper class natives to copy the manners of the conquerors, hence adapting superficially understood styles to the native way of life. This persistence by the colonial masters and imitation by the upper class natives gave prestige to the imported fashions and may be viewed as



being at the root of the present-day attitude among the former colonials that styles from the West are modern and progressive, and therefore preferable to anything locally originated. In the case of architecture, this attitude has been nurtured internally by the local architects who received their education overseas and, externally, by the European modernists who were convinced of the universality of their precepts.

0.1. 'The Spotted Dog.' The Selangor Club, formerly a social center for the European colonists, now serves the élite of Kuala Lumpur.



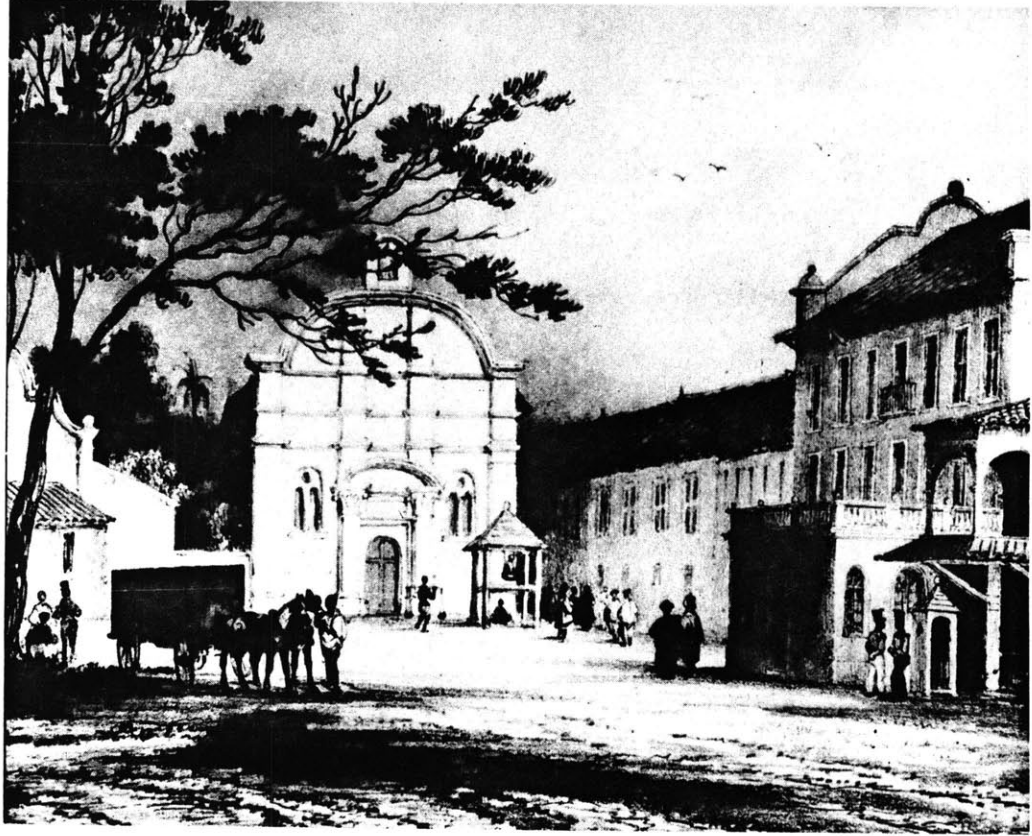
0.2

Following the so-called "death of the Modern Movement" in the 1970s, the idea of a "Malaysian Identity" in architecture has arisen, and, although still undefined, it is a topic of great discussion among the architects of Malaysia and may be seen to be related to government

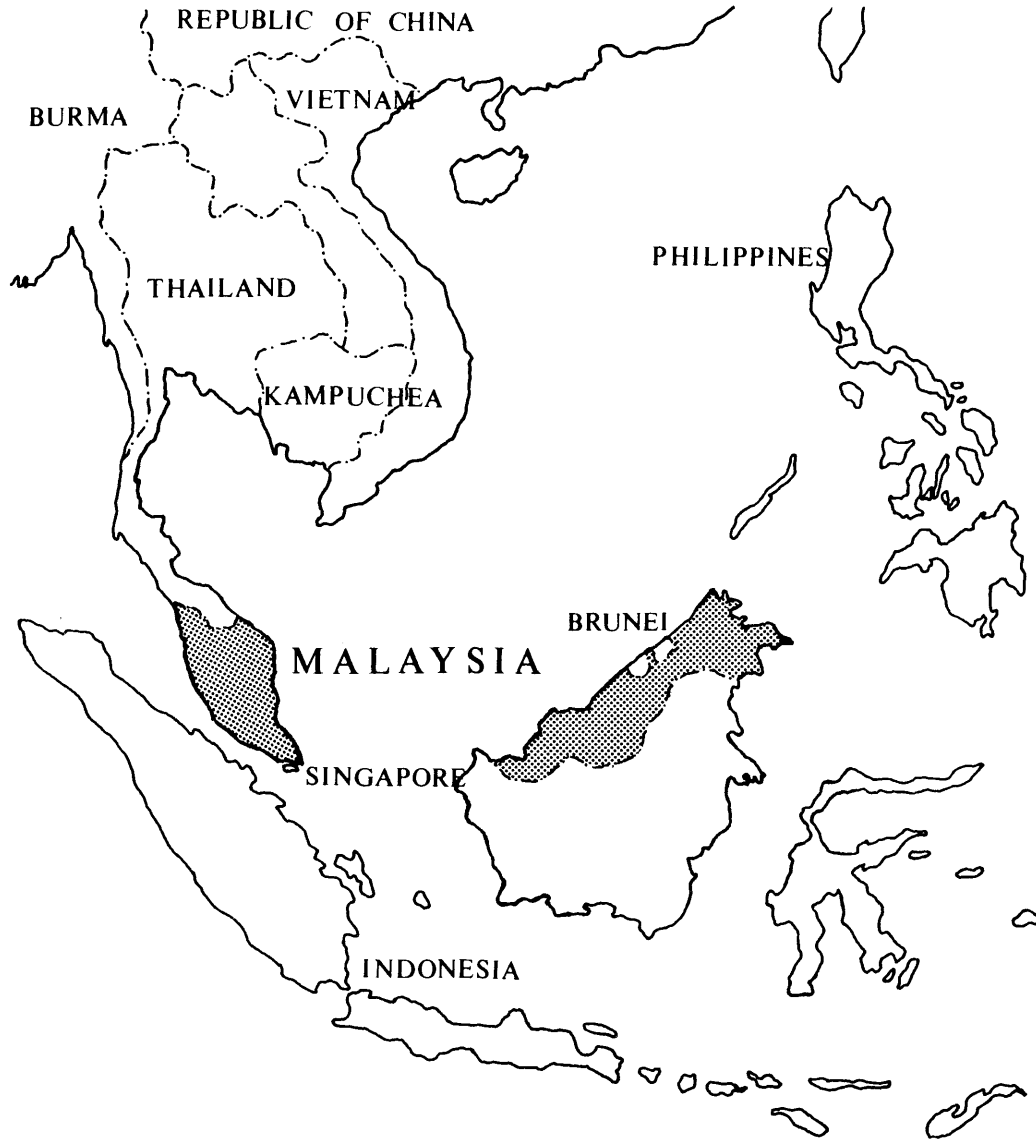
policies concerned with cultural independence in the wake of political independence. The proposals which have been put forth, for the most part, concern themselves with the cosmetic, surface appearance of buildings and hence have failed to uncover basic principles of intrinsically Malaysian design. A study of the design tradition at a fundamental level is prerequisite to establishing a Malaysian Identity in architecture.

Although by no means conceived to be an exhaustive report or the summary of a definitive study, this thesis attempts to bring forth principles of design of the traditional Malay village and to apply these principles to a hypothetical housing development in Kuala Lumpur, Malaysia's capital city.

*0.2. Menara Bumiputera,
vernacular style exploded
to the monumental.*



PART I: BACKGROUND



1.0

Chapter 1: Historic Background

At the southern end of mainland Southeast Asia lies the Malay peninsula. With the two states of Sabah and Sarawak on the island of Borneo to the east, it forms the modern nation of Malaysia. Because of its strategic position along both the land and water routes to the "spice islands" it has for centuries been exposed to a variety of cultural influences.

When Arabic and Gujarati traders introduced Islam to the area in the 14th century, the animistic beliefs of the Malays had already merged with Hinduism brought from India. With the growth of Islam along the peninsula, many of the Hindu/animistic principles and practices were assimilated, creating a localized form of Islam. Many examples of this integration exist today in Malay culture, such as the animistic

rituals associated with house-building, or the Hindu practice of crowning the newlyweds "king and queen for a day" in a Malay wedding ceremony.

The European influence has been strong in the area since the 16th century when the Portuguese colonized Malacca in the south of the peninsula. The Portuguese were routed by the Dutch who were in turn supplanted by the British. Under British rule, the land underwent extensive development, to produce rubber, tin and, more recently, a number of agricultural products such as palm oil and coffee. The British also left behind an institutional legacy in the form of a parliamentary government and a Western educational system when they granted independence to the Federation of Malaya in 1957. Malaysia was established as a sovereign nation in 1963.



1.1



1.2



1.3

1.4

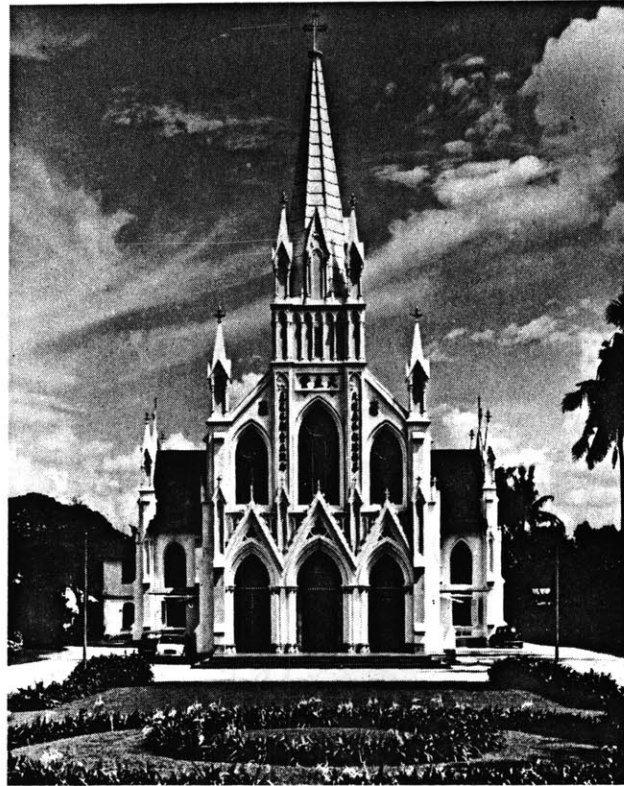


1.2. Descendants of Portuguese perform festive dance.
1.3. Chinese altar to Lord Buddha. 1.4. Stupa at entrance to Hindu temple.

Malaysia's broad ethnic diversity can be attributed to the British as well. In the late 19th and early 20th centuries, Chinese and Indian laborers were imported to work on the rubber plantations and tin mines. The new immigrants brought their own religions and cultures to add to the mix. At present, out of a population of twelve million people, 49% are Malays, 35% Chinese, 9% Indians, with aborigines and Eurasians making up the remainder.

The cultural syncretism which has evolved is manifested to some degree in every aspect of modern Malaysian life, from "national character" to the built environment. Winstedt (The Malays: A Cultural History) described Malay culture as:

"owing ideas and practices to pre-historic influences of central Asia, to the kingship and architecture of Assyria and Babylon, to Bronze workers and weavers from Indo-China, to the literature and religion of Persia and Arabia, to the material civilizations of Portugal, Holland, and Great Britain, and to the remote but compelling fantasies of Hollywood."¹



1.5. Church of the Holy Rosary, Kuala Lumpur.
1.6. Coliseum Movie Theatre, Kuala Lumpur.

1.5

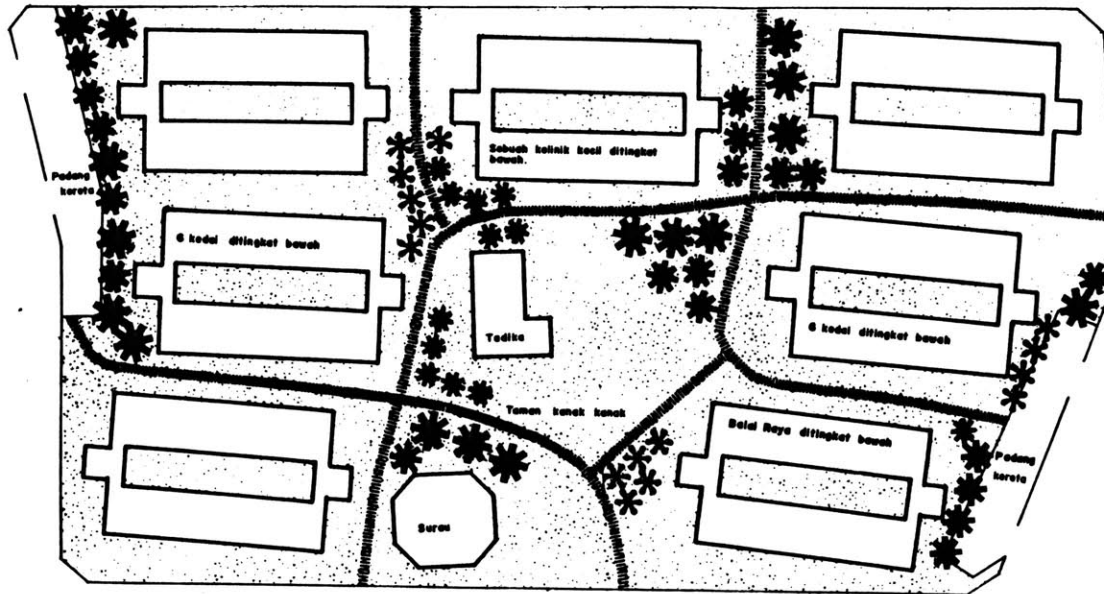


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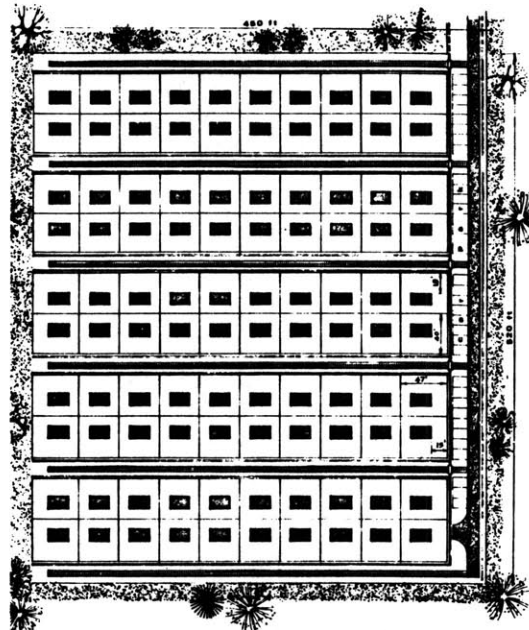
Chapter 2: Working Method

While doing the research for this thesis, I was surprised and disappointed to discover that little work has been done on the analysis of the built environment in Malaysia. It seems that the subject of the Malay house and village is of little interest to the architectural community. In the field of housing, designing is done according to well-established formulas, and new ideas have a hard time finding their way into the system, even if the new idea has been around for centuries.

Needless to say, this had a great effect on my method of collecting data. Although I did read what little relevant material does exist, I found it to be more instructive to travel throughout Malaysia, observing the environment and talking to people about their houses and villages.



2.0



2.1

layout plan for type: S2/2/2 (TM 2/3)
 plan susunatur bagi jenis rumah: S2/2/2

2.0, 2.1. Well-established formulas for housing.

My husband and I visited many villages throughout our journey; some rural and rather isolated, others functioning as parts of larger cities. We examined villages at all levels of development, from relatively untouched fishing villages along the East coast, to heavily populated urban kampongs in Kuala Lumpur, to newly built low-cost housing projects. Although we observed a variety of house styles throughout the peninsula, I have tried, in my analysis, to find principles that are, if not common to all styles, at least appropriate to the general situation of housing in Malaysia.

In our talks with inhabitants, we tried to learn how people live, how they use their houses, and how they feel about the way they live. We wanted to understand how they are affected by their environment and vice versa. We talked with people at bus stops, in trains, on the street,

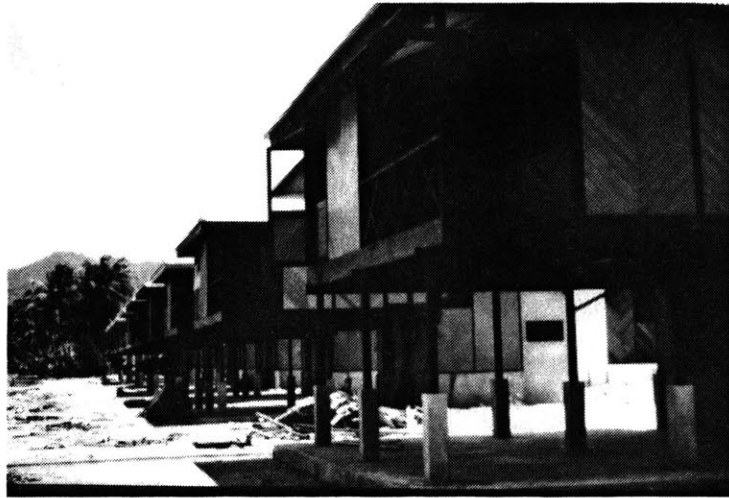


2.2



2.3

2.2. Kg. Pelindong, a fishing village in Pahang.
2.3. The old commercial section of Malacca.



2.4



2.5

2.4. A pseudo-vernacular village built for villagers displaced by an industrial complex. 2.5. Using a government housing loan, a civil servant built a "modern" house for her parents. Their old house is in the foreground.

in their homes, and in the universities. It was unfortunate to discover that people who lived in the older houses were usually rather ashamed of them, for a traditional house has the connotation of poverty. Because of this lack of pride in their heritage, people are more apt to move to a "new style" concrete house when they have the money, rather than fix up the old wooden house. This allows the deterioration of the older house, and since there are very few new houses being built in the manner of the past (or in wood, for that matter), threatens the traditional Malay house with extinction.

All in all, my observational methods were very subjective, and consequently my analysis tends to be also. Although some may find this objectionable because of the lack of rigor, I think it is actually to the benefit of the design process.

My self-involvement allowed the architecture to speak to me directly. My open-ended analysis is intended to allow further interpretation and adaptation by others. I am not setting down concrete rules so much as identifying general tendencies, for I do not believe architecture to be a static thing. I feel that my working method is consistent with my subject matter.

A comparative approach between rural and urban settlements has been taken whenever possible, so as to explore the evolution and transformation of the basic rural house-form in the urban context. By examining those aspects of the Malay built environment which remain fairly constant during the shift from rural to urban, one may begin to understand what the Malays deem important in their surroundings. Difficulties arise when one considers that the newly migrated urban villagers are never living under the

best of circumstances and that they will not have a good deal of freedom in arranging their living spaces. Therefore, those characteristics of the rural environment which show up in the urban setting should be thought of as the most basic, and not the limit of what is relevant to living in the city.

2.6. Kg. Harriet, a squatter enclave in Georgetown, Penang.

2.6



In my analysis, I have separated the material into three sections. The first part, site, deals with the village scale and examines issues which are often outside the domain of conscious decisions on the part of the inhabitants. The other two sections cover two aspects of the house itself. The categories, House External and House Internal, are not merely defined by the thickness of a wall, but by attitudes toward family and society which have played major roles in shaping the Malay house.

The concept of "budi" has had a strong influence on Malay society. Budi can be defined as a code of ethics in the realm of societal interactions. It teaches respect for others and encourages the feeling that all Malays are part of one large family. (As evidence of this, such terms as brother, sister, aunt, and uncle are used as greetings

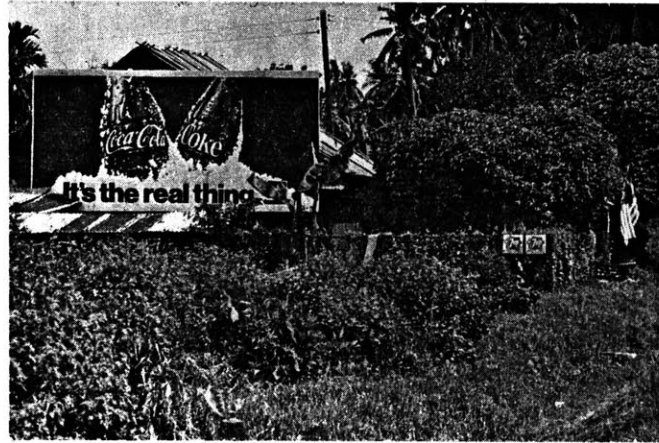
within the Malay community.) When coupled with the outward-directedness of village life (perhaps typical of societies in the tropics), the effect of "budi" extends to the house and its surroundings. Concepts such as privacy and territoriality are defined very differently than in the West.

Similarly, the interior spatial arrangement of the house has been influenced by family life. Although the layout of the house has been interpreted as a metaphor for the structure of society, spaces are adapted and defined by the roles which people play within the family. This idea will be developed further in the chapter on House Internal.

As the nature of this thesis is quite subjective I feel it is appropriate to record my personal reflections on what I have observed on my visits home to Malaysia. The two trips back

which I have taken during my six years in the United States have been disturbing and thought-provoking experiences. Expecting some changes, I was not prepared for the accelerated pace at which they are taking place. Without going into figures and statistics, one notices the congestion in the cities, in terms of cars, people, and new buildings. Signs of affluence such as television sets, stereos, video cassette records, Mercedes Benzes, designer jeans, and other consumer status symbols depict the new material-conscious society. Kuala Lumpur, the capital city, is filled with hustlers, businessmen, politicians, professionals and people from the countryside trying to "make it" in the big city.

The new affluence can be attributed to the rapid industrialization programs initiated in the Third Malaysian Plan, the discovery of high-grade oil in the South China Sea,



2.7

the relatively high prices of raw materials like tin and palm oil, a stable government very strongly committed to the free market system, a rich hinterland of forests that yield high quality timber for export, and a potential cheap labor force known for their non-aggressiveness and tolerance. Multinational corporations (American, Japanese, German, Australian and the ever-present British) see Malaysia as a congenial area for profitable exploitation.



2.8

2.8. "Miss National Semi-Conductor Corporation (Malaysia)". 2.9. "Rohaiya Yusuff works to the beat of piped-in American rock and popular music at the H.P. Malaysia plant."



2.9

As a result of this tremendous economic development, changes are taking place in the sociocultural and physical landscapes. The ubiquitous factory buses ("bas kilang") bring young women workers from their villages or company barracks to work their shifts in the electronics factories. While traveling along the main "trunk roads" you also encounter convoys of trucks hauling logs from the jungles to the

sawmills and to the docks for export. Five years ago, one would see only two or three such trucks during the two hour journey from Malacca to Kuala Lumpur. Now there are fleets of them every few minutes or so. Industrial pollution is on the rise as more companies set up factories in unregulated Malaysia rather than comply with stringent pollution control laws back home in the West. I did not know that such a thing as a bright pink river exists until I saw one in Penang this past summer.

As a Malaysian, I have mixed feelings toward the development which my country is undergoing. Although I understand the need for economic growth, and even feel a certain sense of pride while watching Malaysia increase in stature within the international community, I am filled with remorse by the knowledge of what has been lost.

Chapter 3: Vernacular Architecture

Indigenous buildings are not built by architects but by local craftsmen, master builders, carpenters, or owners themselves. Their formal and spatial relationships and their placement on the site have an underlying rationale which is derived from and responsive to the environment. This language of built is understood by the local builders, and, although not generally conceived as such, it is part of an integrative system of values and world view shared by the inhabitants.

Amos Rapoport, in his seminal book, House Form and Culture, describes the characteristics of vernacular building as,

"... lack of theoretical or aesthetic pretensions; working with the site and micro-climate; respect for other people and their



3.0

houses and hence for the total environment, man-made as well as natural; and working within an idiom with variations within a given order."²

This given order may be thought of as the methodology of traditional practice, and is intimately linked to the life patterns of the inhabitants at all levels, pragmatic to mystical. The vernacular built environment is not the consequence of any single determinant, but results from a wide range of socio-cultural factors including climate, the need for shelter, materials, available technology, site, economics, history and religion.

3.0.Kg. Korok, a fishing village on Penang Island.



3.1

3.1. A three-tiered pyramidal mosque at Paya Rumput, Malacca.

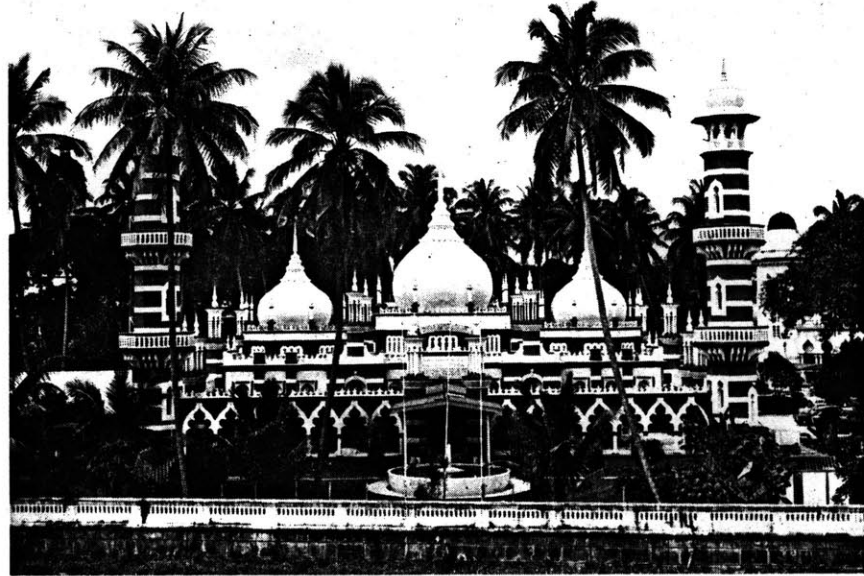
From the physical determinist viewpoint, the form of the Southeast Asian mosque is easily explained. The pyramid-shaped building is a direct response to the problem of spanning the maximum area possible using ordinary post and beam construction, the method of construc-

tion which has housed the Malays for centuries. The steep pitch of the roof, like those of the houses, deflects the heavy rains and brilliant sun of the tropics. The roof is tiered, ostensibly to introduce air vents beneath the broad overhangs, but also to shorten the roof span, simplifying construction. But like all indigenous architecture, the Malay mosque fulfills a variety of roles. To use Charles Jenck's terminology, it is a "multivalent" building.

Ask any oldtimer in the village, and you will be told that the old style of mosque came from Sumatra, when Islam was initially introduced to the region. This building type spread north to the Malay peninsula with the religion, presumably in the 14th century. To the villager, the mosque provides an historical link to Indonesia, a land esteemed by many Malays as the ethnic and

cultural forebear of Malaysia. The mosque, by virtue of its history as a building type, is a medium of communication with the larger region, if not the Islamic world as a whole, and has had an effect, although subtle, on the Malay world view. Unfortunately, with the introduction of Middle Eastern styles by worldly British architects and with the spread of pictorial media in the twentieth century, the local style of mosque is being supplanted by a more universal notion of what Islamic architecture should be.

In relationship to the structure of the village, the mosque has played a central role, both in a formal and a social sense. Being the main public gathering place, it acts as a social catalyst, bringing together groups of people who otherwise might not be in contact. Although this is independent of the building itself, the traditional mosque does serve as



3. 2



3. 3

3. 2. A. B. Hubbock's Masjid Jame in Kuala Lumpur (1909).

3. 3. Conflict of forms in new mosque construction.

an organizing element within the village, but perhaps on a more symbolic level. Its increased size, relative to the surrounding houses, makes it a readily identifiable landmark within the community, and raises it above the level of the ordinary, as is fitting for a house of prayer. The mosque has an intimate relationship with the rest of the built environment. Being of the same construction as the homes and yet larger, more ornate, and of a regularized (pyramidal) form, the mosque can be viewed as an idealized house, thus providing a physical metaphor for the role of Islam in everyday life. The mosque is symbolic of the ideal spiritual life, and the houses represent the daily ethos of the inhabitants. This lends a certain coherence to the religion and to the built environment as well.

Another less obvious aspect of the

traditional mosque is its connection to the craftsmen, the local builder. By being an idealized house with its high degree of ornamentation and detail, the mosque sets a standard for construction of ordinary homes. Although no houses, except perhaps the sultan's palace, have the grandeur of a mosque, the opulence and fine craftsmanship can be looked upon as inspiration for the ornamentation of domestic construction. In this way, it serves to maintain and encourage the local building crafts.

An association of the Malay house with the spiritual world can be inferred, not only from its typological reference to the mosque, but from the system of beliefs surrounding the building and occupation of the house. An examination of the rites of construction exposes a series of rituals which, by their proclivity toward the animistic, hark back to pre-Islamic times

(see Appendix A). Through the rituals, the prospective home owners consult and appease the vital forces (semangat) of the trees, rocks, creatures of nature and even of the earth itself before building, and take great care in providing for the 'semangat' (spirit) of the house during construction. As man humbles himself to nature, so does the house humble itself to the site. This is an example of Rapoport's notion of the religious attitude toward nature, in which man is subservient to the environment.

The contrast between this way of thinking and the prevailing trend in building construction is quite striking. As cities expand, suburbs are pushed onto hills and other sites which had previously been avoided. In a country with a large manual labor force and a disproportionately small number of



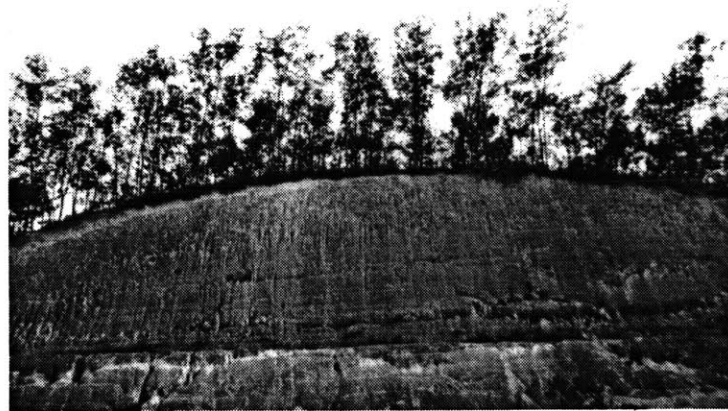
3.4

professionals, it has proven to be expedient (and more cost-effective) to bulldoze across a flat landscape than to individually engineer houses to sit on a hill. This domineering method of operation is creating a number of problems. It necessitates destroying all vegetation on the site, eliminating shade trees which give significant respite from the direct sun. As the temperature difference between sun and shade is so great, people are less inclined to walk outside their

3.4. The organic relationship between the natural and man-made landscapes.



3.5



3.6

3.5. Newly-constructed middle class "terrace" houses.
3.6. One half of a hill.

houses, thus discouraging pedestrianism and reducing the number of social contacts in a given area. It is seemingly minor changes such as this which are altering the way of life in Malaysia.

There are also physical problems generated by all this earth-moving activity. The sandy soil of the Malay peninsula is weakened by the removal of the layer of vegetation, resulting in a series of landslides and cracked walls. The earth can be quite threatening when a hill is cut in half along a property line. These landslides, however, are too small to warrant a write-up in the daily newspaper; an exception to this being when the Prime Minister's suburban home was threatened with imminent collapse (New Straits Times, August 1981). Fortunately for the Prime Minister, and unfortunately for the future of the environment, retaining walls were erected in time to avert disaster.

Chapter 4: Change

With the introduction of rubber-tapping to the rural Malays at the turn of the century came the beginnings of major social change. As the world's demand for latex skyrocketed with the mass production of automobiles, Malaysia emerged as the major producer of natural rubber. Subsistence farming (rice for home consumption) was thus replaced (or at least amended) by the new cash crop, and the Malay peasant became a member of the world economic system. As the majority of the rubber was produced by small scale individual tappers, rather than by large plantations, it was the peasant himself who was directly dependent on prices in the world market.

Change occurred within the structure of the community as well. Land which had previously been "ancestral land," handed down within families for food



4.0



4.1

production, became a commodity once money could be derived from it. A basically egalitarian society was replaced by a hierarchical class structure; those who had claim to large amounts of land became landlords, those who did not became tenants. This transformation was a consequence of the integration of the village economy with the larger economic system, for in a system based on subsistence farming there had been no incentive to accumulate wealth, or more precisely, there had been no wealth to accumulate.

4.0. Planting rice. 4.1. Tapping rubber.

The coming of Western communications and transportation systems gave the villager further exposure to the outside world. By the 1930s, the railroad network had extended nationwide to facilitate the removal of goods from the hinterland. The effect was to stimulate the growth of cities along the line, advancing the urbanization of the peninsula. In recent years, the proliferation of automobiles and the building of highways has also contributed to the mobility of the population. The mass media, radio, television, and vernacular (Jawi) newspapers present villagers with a diversity of values, and allow the realization that there exists a degree of choice between different "ways of life." In this manner, the secularization of a traditionally conservative community has been encouraged.

Malaysian society is now at a con-

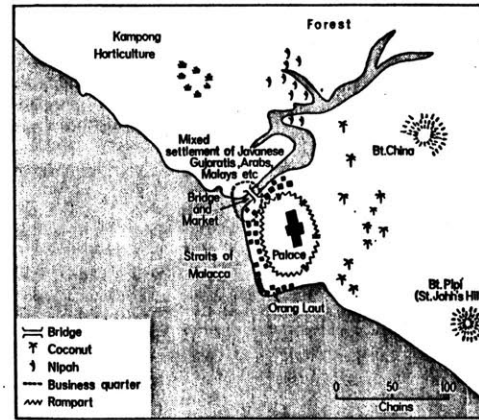
fusing juncture, for the problem is not whether to accept or reject Western values and methodologies but rather to decide what aspects of Western culture should be appropriated and to what extent they can be adapted to the Malaysian context. This is a difficult question, for modern Malaysian culture is already an amalgamation of sorts, deeply influenced by centuries of colonization. An example of this is apparent when one examines the history of urbanization in the Malay peninsula.

In pre-colonial times, what may be thought of as a city was for the most part a group of villages, grown together for mutual benefit (usually economic), with no attempt made at organization beyond the village level. The exception to this came with the sultans who organized feudal courts in some cities. Even then, the effect on creating an

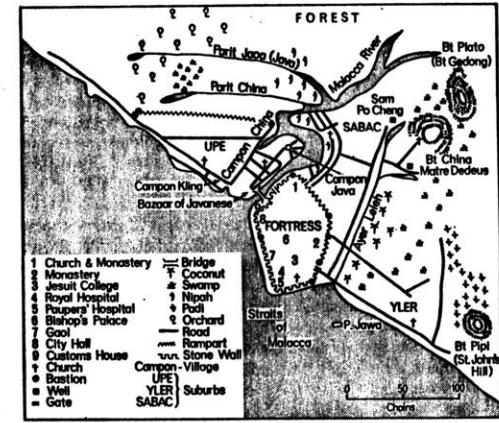
urban system was minimal, for there was no network (economic, political or physical) formed between these population centers. Lim Heng Kow, in the conclusion to The Evolution of the Urban System in Malaya, defines the colonial influence quite emphatically:

"On the whole, the urban system of Malaya did not develop upon an indigenous urban base. The social, political and economic forces operating before the advent of the immigrants and the British failed to generate a traditional urban system. The present system of cities emerged ... within the framework of a colonial economy which provided the necessary infrastructure."³

British colonial policy necessitated the growth of only one city in the region to act as the major link to the West. During the colonial period, Singapore dominated the region, with smaller cities, such as Kuala Lumpur, acting as sub-regional centers in the urban network. With the increase in commerce and industry following World War II,



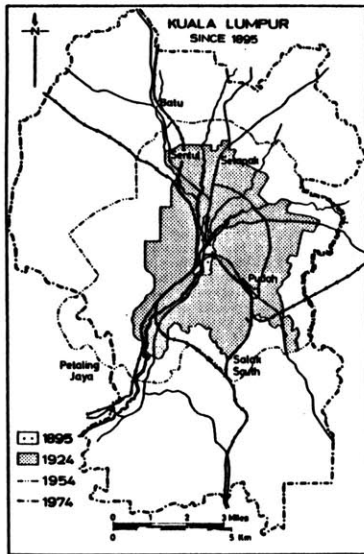
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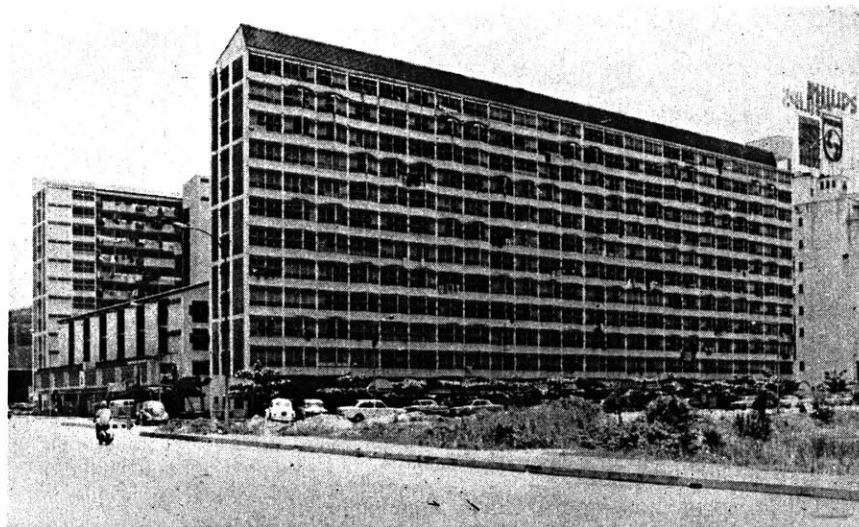
and the centralization of administrative, communications and transportation systems preceding independence, Kuala Lumpur grew tremendously, eventually emerging as Malaysia's primate city. Notable in this growth was the increase in the Malay population, for Kuala Lumpur has been predominantly immigrant Chinese and Indian. This is indicative of a shift from the rural areas to the urban center. Unlike the point-concentration form of expansion which has characterized most colonial cities, Kuala Lumpur has expanded outwards,

4.2. Map of the Malay City of Malacca, c. A.D. 1500.
4.3 Map of Portuguese Malacca, c. A.D. 1600.



4.4

4.5. Suleiman Court Flats, erected as an attempt to solve the squatter problem.



4.5

with the formation of satellite towns and then with rings of suburbs filling in the gaps. Again, this is patterned after the typical Western city in the postwar boom.

Based upon its failure to "generate a traditional urban system," the indigenous Malay village may be construed to be inappropriate as a model for modern urban design. It is, however, adaptable as infill within the existing urban infrastructure (at perhaps the scale

of a housing estate), and can provide a rich environment, conducive to the strong sense of community which is characteristic of Malay society.

It is one thing to study the traditional methods of building and quite another to actually implement them, for there exists a strong bias against indigenous housing. Government policy is inclined toward high- and medium-rise buildings for low cost housing. In the private sector, new building in the old style would be nearly impossible as well, because of the stringent zoning practices based on British standards. For one thing, residential roads are laid out at a minimum width of forty feet, encouraging fast cars and at times, making it hazardous to even visit a neighbor across the street. This policy, together with the absence of sidewalks and shade trees,



4.6



4.7

severely limits the outdoor life of the residents, by virtually confining them to their own yards. New building in wood is also effectively outlawed by the codes. Ostensibly, this is for fire prevention, but it may be influenced by government export policy concerning lumber, since it is more lucrative to export the wood than to build with it at home.

This bias also exists among the residents. As I have mentioned before, the wooden house and the rural kampong are strongly associated with poverty and are certainly not popular in a land with an ascendant middle class. It is these attitudes which must change before indigenous design ideas can be reintroduced to the built environment.

*4.6. 17-story flats built using a prefabricated system of load-bearing panels.
4.7. A typical middle-class housing estate.*



4.8



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4.10



4.11



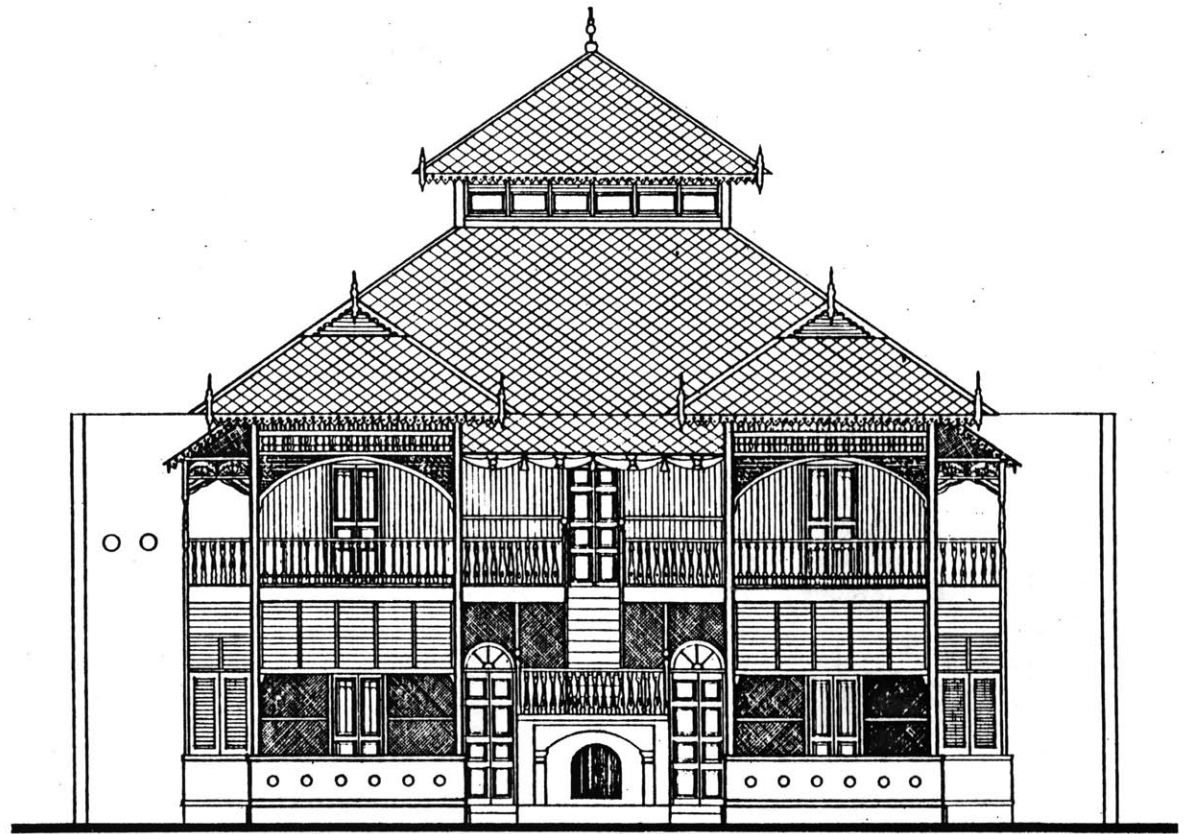
4.12



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Some Solutions to the Housing Problem in Malaysia

4.8, 4.9. Two urban "kampong upgrading" projects funded by the World Bank. Main roads are widened to sixty feet to conform to standards. 4.10. Interior court of four-story flats. 4.11. Children's playground in an experimental low-cost high-density housing project. 4.12. A middle-class housing estate. 4.13 A core housing project in Kuala Lumpur.



PART II : OBSERVATIONS / ANALYSIS

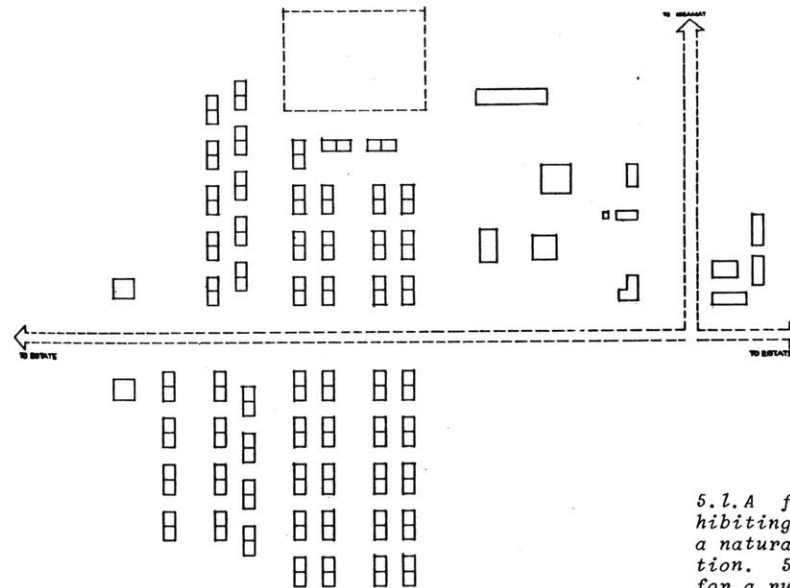
Chapter 5: Site

SETTLEMENT PATTERN:

The Malay village (or Kampong) is a continuation of the natural landscape. The term "field" is an apt description of these settlements. Characteristically, a field is predominantly horizontal, following the contour of the land, and composed of individual units which provide a visual and physical texture when viewed as a whole. A consistency of scale and form is necessary between these individual units. Fields occur in the natural environment at all scales, from mountains and plains to trees, rocks, pebbles, even lichens or barnacles on rocks. Although coherent in and of itself, the naturally occurring field is rarely rigidly structured. A repetitive field, such as a grid, can generally be assumed to be a human construct.

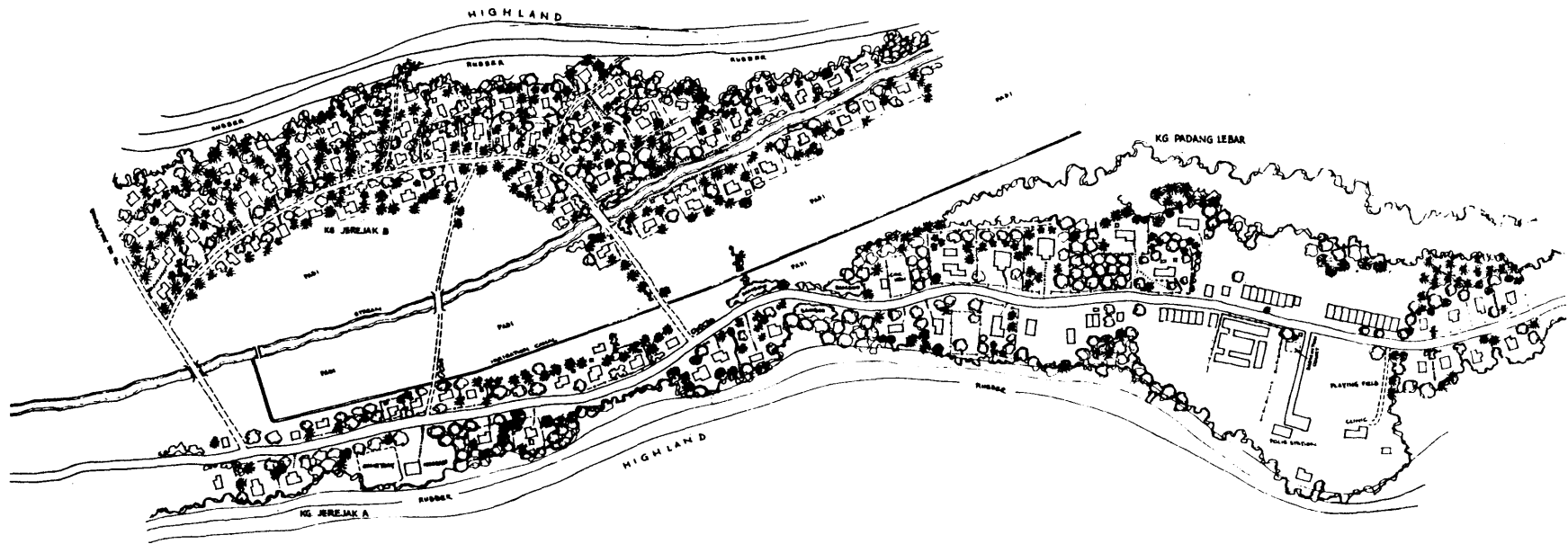


5.1



5.2

5.1. A fishing village exhibiting characteristics of a natural field organization. 5.2. Laborer housing for a rubber estate, based on a rigidly-structured grid.



5.3

Two configurations are discernible in the field distribution of individual houses. The first is a cluster form which is usually found on flat plains, at river mouths, in clearings in the jungle, or as in-fill in the urban landscape. The second configuration is lineal. This form is usually in response to a strong natural definition within the landscape such as a river, a coastline, a roadway or path in the jungle, or along con-

tours at the foot of a hill. Often, the two configurations coincide, forming either a directional field (a grouping of parallel lines) or a series of lineally linked clusters.

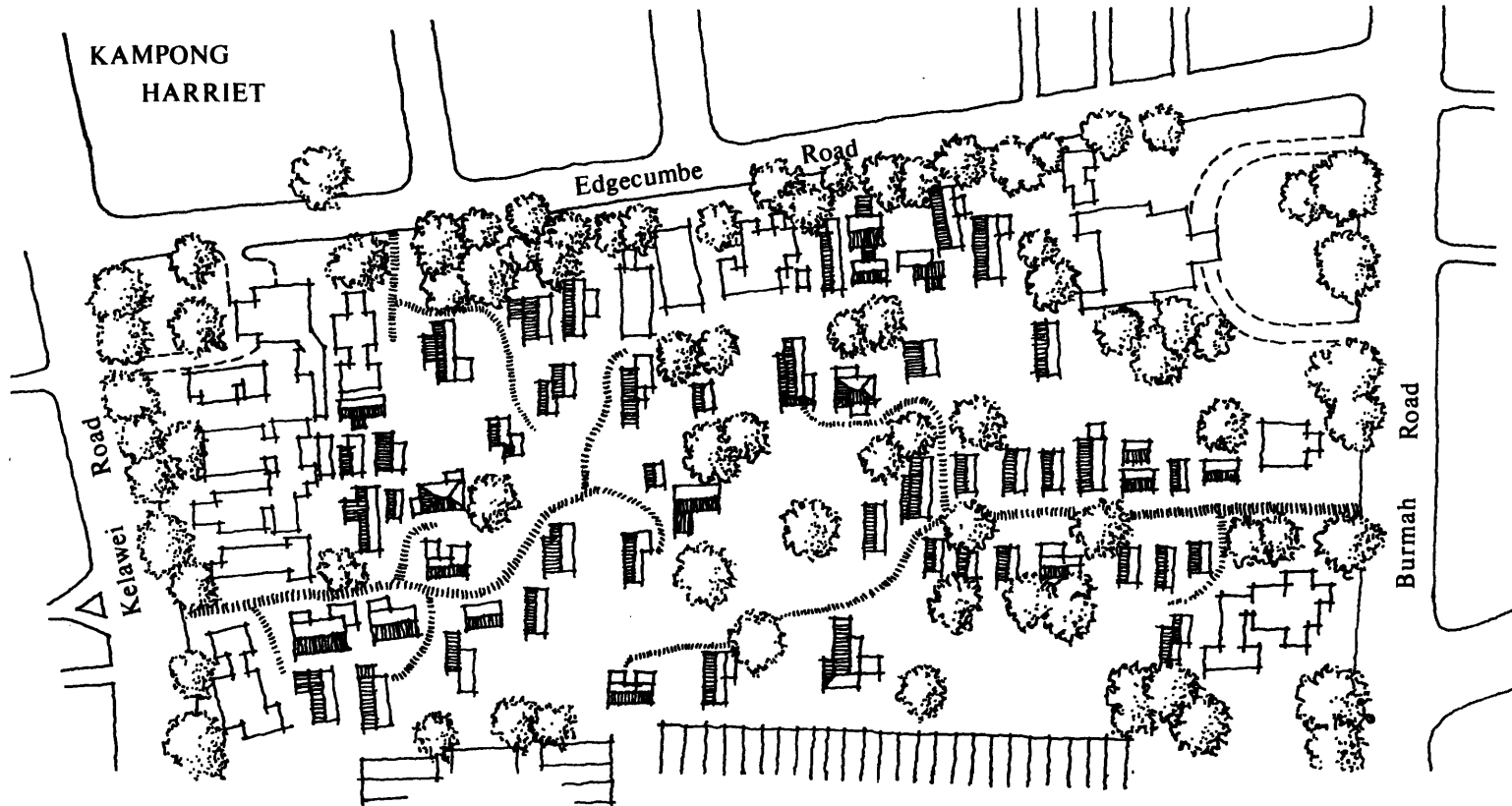
Traditionally, Malay settlements are not built on hills or mountains because of the belief that hills are the abodes of natural spirits, and that one should not desecrate them. However, site location is

5.3. A settlement with both lineal and cluster configurations.

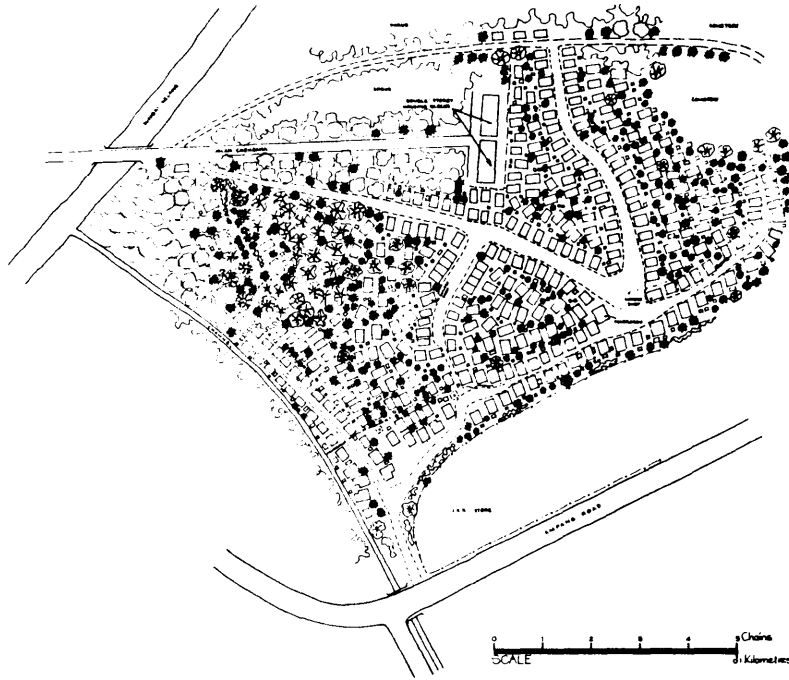
related to the economic base of the kampong in that it is determined in part by its accessibility to places of work. For example, a fishing village will be along a waterway, either on the coast itself, or just upstream of a river mouth, whereas an agricultural

community is located adjacent to or in the midst of farmland (in low-lying flat land for rice cultivation, at the base of hills for fruit orchards). For the modern urban squatter, a site along a public transportation route may prove to be the most auspicious.

5.4. An urban squatter settlement acts as infill within the city structure.



5.4



5.5

DENSITY:

To speak of a "typical" Malay kampong in terms of density is nearly an impossibility, for even in rural areas there can be a great range of densities. This is in part determined by how conducive the land is to being built upon. Where jungle must be cleared before building,

village density might be higher than for a similar community living in a coastal plain. Again, density is related to the means of employment of the inhabitants. A fishing village is apt to be more densely populated than a farming community since the villagers' livelihoods are dependent on the sea and not on the availability of arable land.

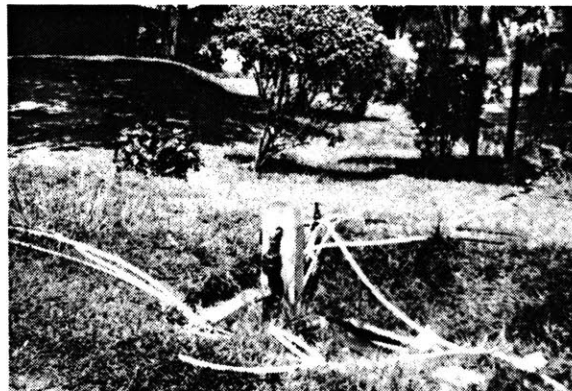
In urban areas, several smaller communities often merge to form a larger entity. In fact this has provided the basis for many cities. It is also common for an "urban kampong" to exist in the midst of a larger city. Surprisingly autonomous, these settlements can function more like isolated villages than integrated neighborhoods. Although generally more densely populated than their rural equivalents, there is also quite a range of densities among the urban kampongs.

SERVICES:

Basic amenities, such as piped water, electricity, sewerage and refuse collection are more readily available in the cities than in rural areas. Nonetheless, trash burning is still quite common in even the most congested urban areas. Traditionally, rivers and streams have served the kampongs as both water supply and open sewer, but due to the strain of increased usage in more heavily populated areas, as well as the introduction of industrial pollutants, they are no longer viable as supply systems. In many villages a well is shared communally for cooking, bathing, and washing and is usually located in the center of a cluster of houses. Public water standpipes often serve as the urban equivalent of the village well. Flush toilets have not been intro-



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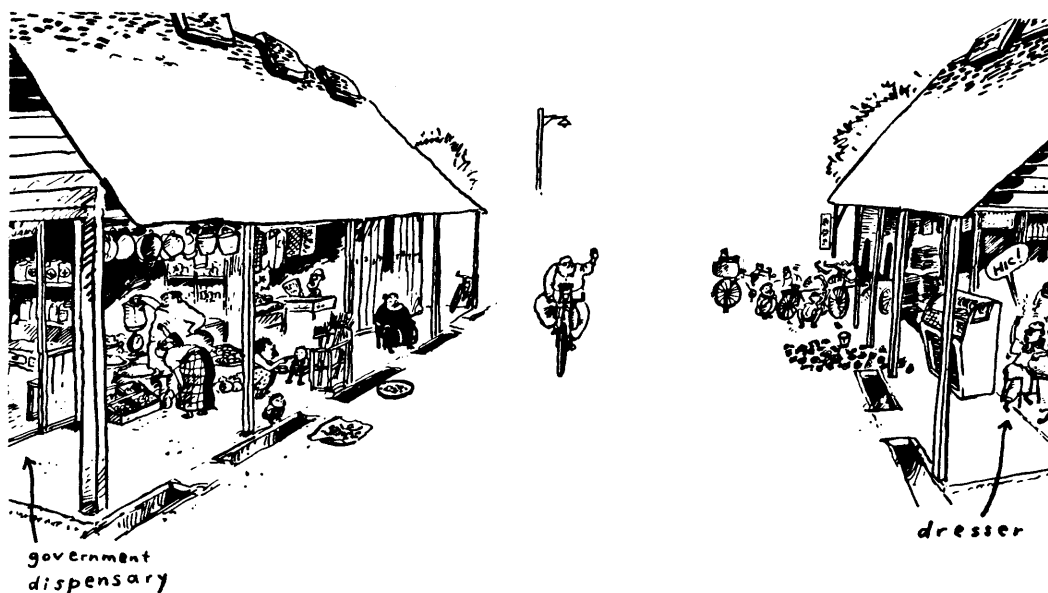


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5.6. Communal well. 5.7. A public water standpipe with hoses to individual units. 5.8. An outhouse on the Malacca River. 5.9. An open sewer.



This is our town.
 Next to the dispensary on the left is Ah Yew's shop where we do our shopping and next to his shop is a cloth dealer who is also a small-time goldsmith. On the extreme right is an Indian eating shop, next comes a book shop, a rubber dealer and a bicycle shop.

5.10

duced to most rural communities where the pit latrine or the bucket system are the common methods of waste disposal. There are usually no concrete drains for waste water, but rather a trench dug from the kitchen or washing area to a pond or stream nearby.

Less crucial services are often regionalized in the rural districts, so as to serve a number of kampongs. The police station, health clinic, primary school and post office can be found in a small town nearby (how near depends on the number of kampongs in the area). Most kampongs, however, have their own mosque or surau for praying, and provide religious education to the children after school. The small towns, with specialized shops, also serve as links in the overall distribution system by selling such things as bicycles, car parts and clothing, and by buying goods from the villager (the rubber shop which buys latex from the independent tapper is an example of this). Even in comparatively isolated areas, there is bus service between the kampongs and the town, so as to make this set-up viable.

COMMUNAL ZONES:

An open public space within the cluster of houses provides an opportunity for social intercourse, and contributes to the vitality of the community. The formal attribute of this space is that of containment, with the dwellings furnishing the enclosure. Unlike its European counterpart, however, this "village square" is not strictly delineated by a strong wall of buildings or roadways, but is implied by the positioning of the houses with respect to each other, and in relation to the network of paths.

The character of these communal zones is largely determined by their uses. Often the village well will be the focus of a gathering space. Areas where shared services or communal activities take place are natural meeting places. In

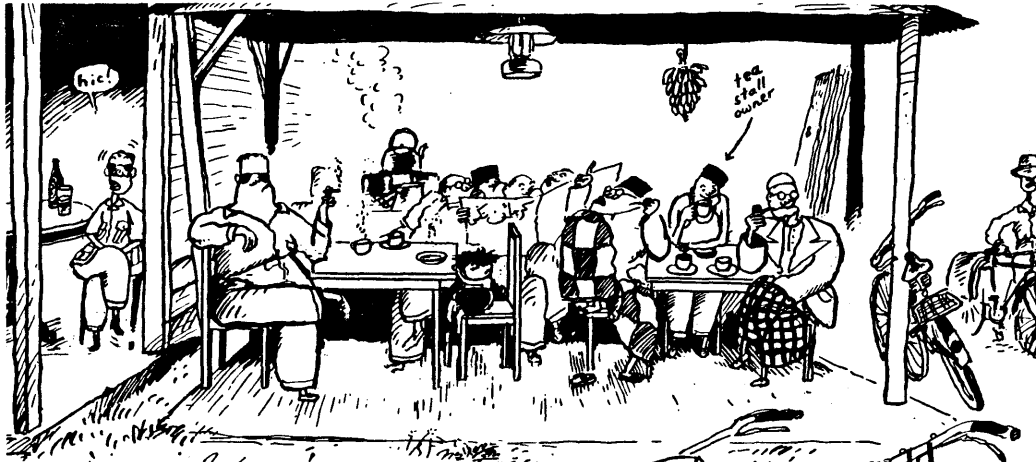


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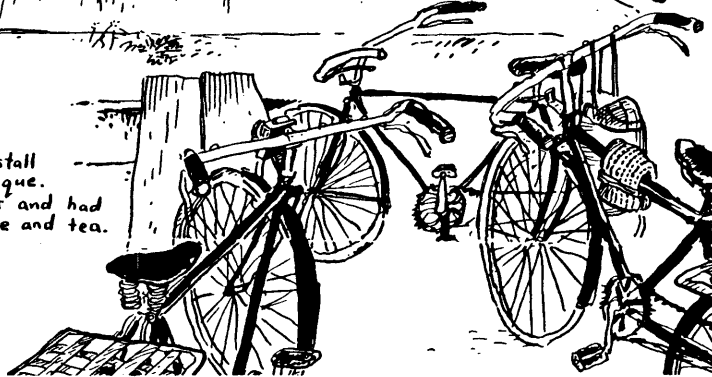


5.12

5.11. A children's play area between houses. 5.12. A village well.



When the shopping was done we would proceed to a tea stall in front of the village mosque. Here the kampung men met and had long conversations over coffee and tea.

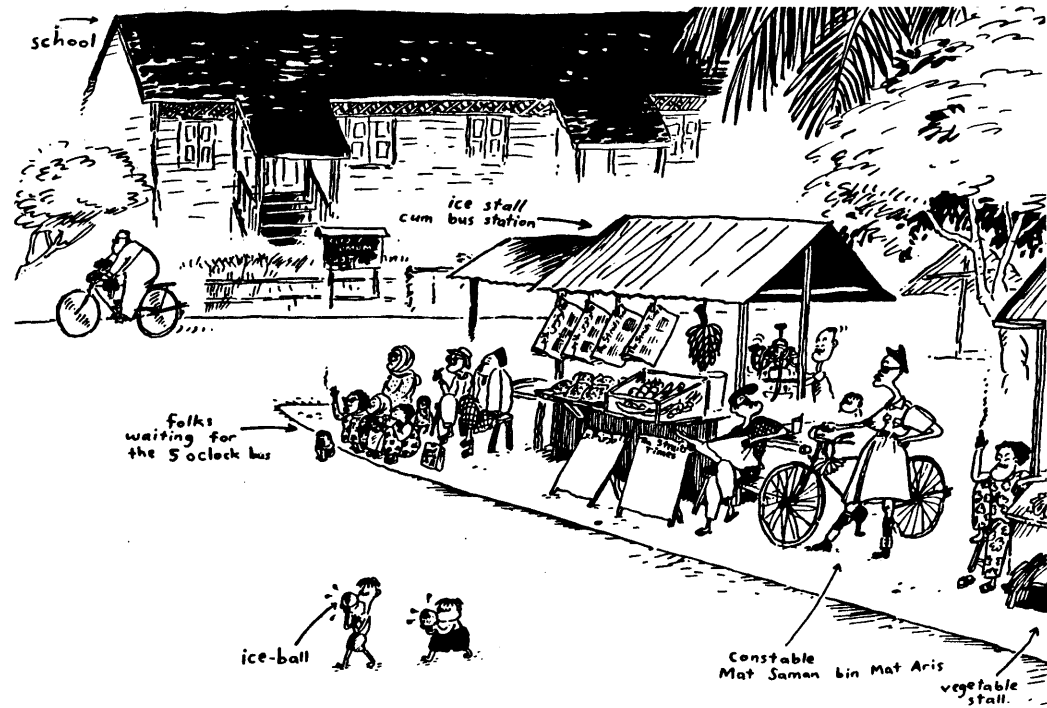


5.23

some kampongs, the coffee shop or the grocery store are favorite lingering spots. Such places are intensified by the pedestrian and vehicular paths that open onto them. In fact, crossroads can be so lively that even if there are no shops, they are likely places to find hawkers' stalls selling food and drink.

In larger kampongs, there may be a variety of public spaces, ranging from the larger commercial area to land shared by a few households or associated with a public building such as the mosque. It is in these shared spaces that children play, clothes are washed, bicycles repaired and much of the daily life of the kampung occurs. In a society so exterior-oriented, the outdoor areas take on great importance, and it is the variety of overlapping uses which makes them the vital entities which they are.

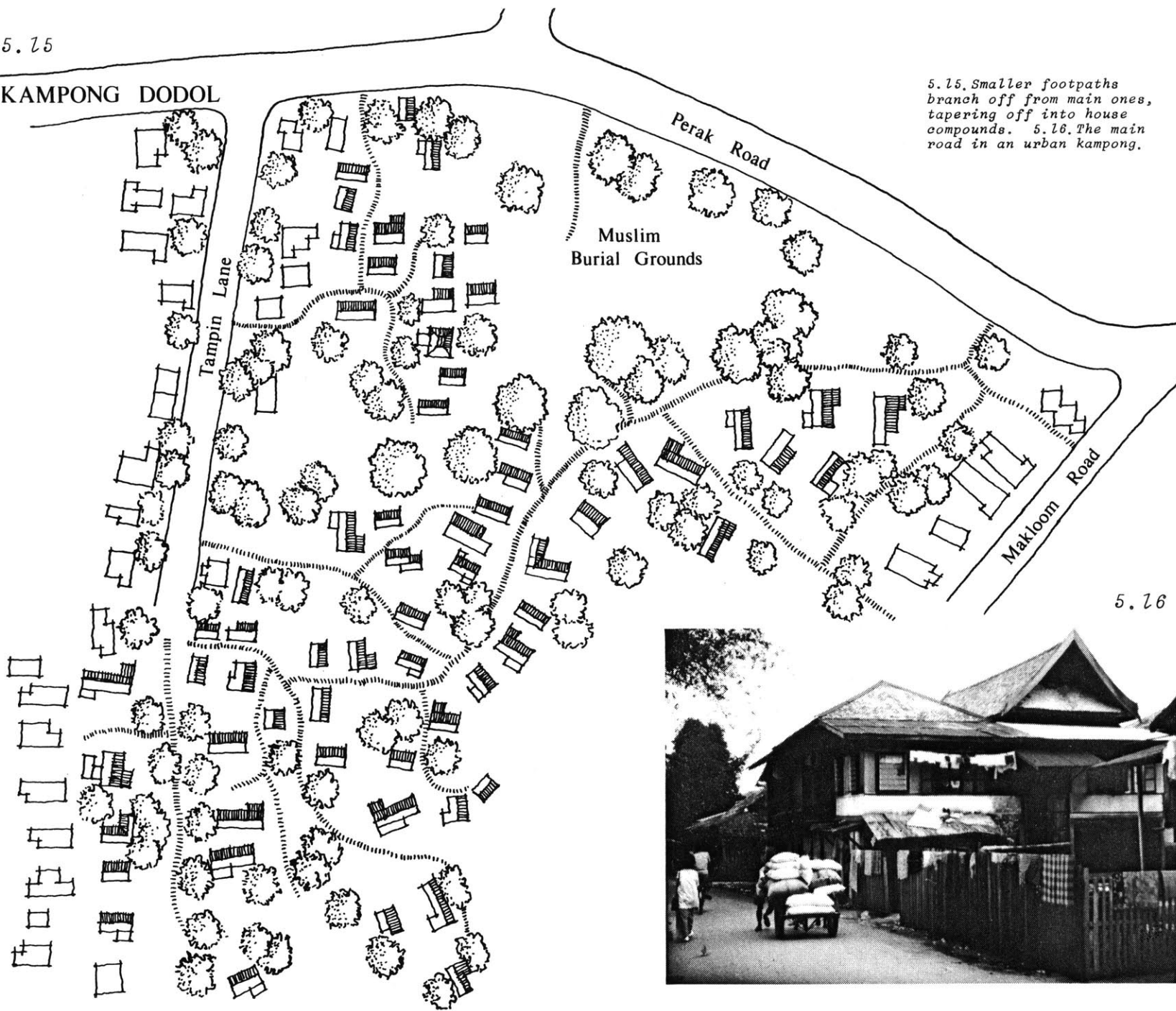
It is in the evening when social life is most active in the village. People prefer to be outdoors after the hot sun has set, relaxing with friends at the end of their work. It is at such times that public spaces play an essential social role, for it is beneficial to the community for people to feel comfortable outside their personal territory and to have a sense of belonging to the whole village.



5. 74

5.15

KAMPONG DODOL



5.15. Smaller footpaths branch off from main ones, tapering off into house compounds. 5.16. The main road in an urban kampong.

5.16



PATHS:

The system of pedestrian movement is informal and fluid; a network arising out of the natural movements and activities of the inhabitants. People do not generally change direction in abrupt angles when walking, for they tend to take the shortest or easiest path to their destinations. The pathways are no longer used solely by pedestrians and bicyclists, for now that cars and motorcycles have been introduced to the kampong, many footpaths have been transformed into roads. There is no real danger in automobiles sharing the road with people on foot, for these are roads which developed at the pedestrian scale, hence are narrow and winding, and cars, of necessity, manoeuvre them very slowly.

As these paths cross each other, they often take on the role of terri-



As you can see our kampung lane was very narrow. Very rarely could we see a motor-car passing by. But when we saw one...



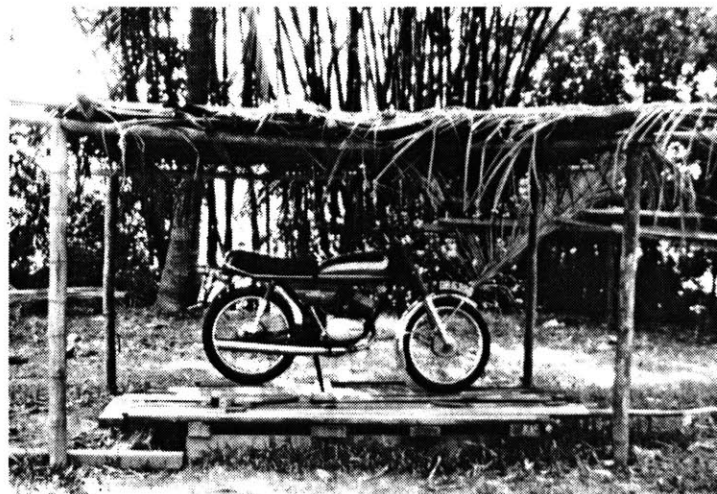
...we had to give way.

5.17

torial markings for the dwellings. It is difficult to say if the house sites are determined by pathways or vice versa, for paths develop between houses as readily as between important places in the landscape (such as the river or the rice fields).



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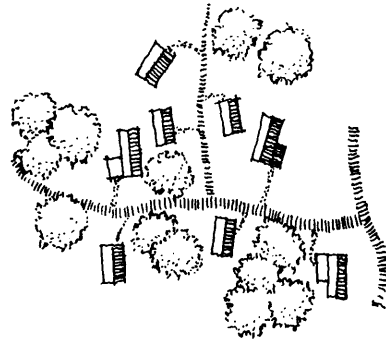
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Automobiles, although not rare, are still new to the kampong, and owners have a strong feeling of pride toward them. So, despite the low, nearly nonexistent, incidence of theft or vandalism, people prefer to keep their vehicles as close to their houses as possible. Cars are often stored in the open space beneath the house, and when that is not available, they are parked in the compound in front of the house.

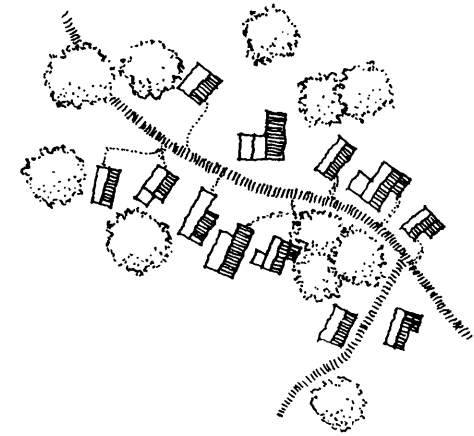
5.18, 5.19, 5.20. Protecting vehicles from the elements.

SITING OF HOUSES:

An outsider, upon entering a Malay village may feel a bit confused by the apparent disarray with which the houses have been laid out. This is due to the somewhat arbitrary arrangement of the paths between houses, and is accentuated by the manner in which the houses are placed. The houses are sited in such a way that the view tends not to be blocked by houses alone, thus creating an impression of open space, even if the village becomes more densely settled. There is an understanding among builders to build with a consideration for privacy and to allow an unobstructed view whenever possible. The villagers' conception of space is highly selective, being based more on respect for neighbors rights than on the idea of possessing personal territory. In fact, residents often find it difficult to identify the exact boundaries of their plots of land.



5.21



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The houses do not necessarily face the path or road directly, as they are often clustered among themselves, creating commonly shared yards. Such clusters usually consist of three to ten houses whose occupants are often related. These aggregates grow with time in a very informal way:

"If new settlers come in from other areas or new families are created by marriage, permission to put up a house is fairly easily granted by the owner, and no rent is charged for the land."⁴



5.23

5.24



5.23, 5.24. There is an absence of built territorial definition in the traditional kampong. This is in contrast to the heavy security precautions of the contemporary housing estate.

TERRITORIALITY:

Nothing could be further from the fenced-in house lot of a contemporary Malaysian housing development than the compound surrounding a house in a traditional village. Here, territory is marked very subtly by physical traces such as a fallen coconut plam trunk, a laundry line, or a row of potted flowers in front of a house. I visited one house whose "lot" was marked by two sticks stuck into the ground to define a "gateway" through an imaginary circle around the house. Sweep-lines made with a broom may identify the boundaries of a well-kept compound.

In a community as close-knit as a rural Malay kampong, there is little need for the security precautions which are so characteristic of the urban housing estates. Fences and walls are frowned upon

by the villagers, who consider them unfriendly and status-seeking. The implied code of conduct, 'budi', ensures that even the most minimal definition of territoriality will be respected by others.

Other methods of defining space include: staggering buildings to partially enclose an area; allowing footpaths to delineate edges; and terracing, to create vertical boundaries with small level changes.

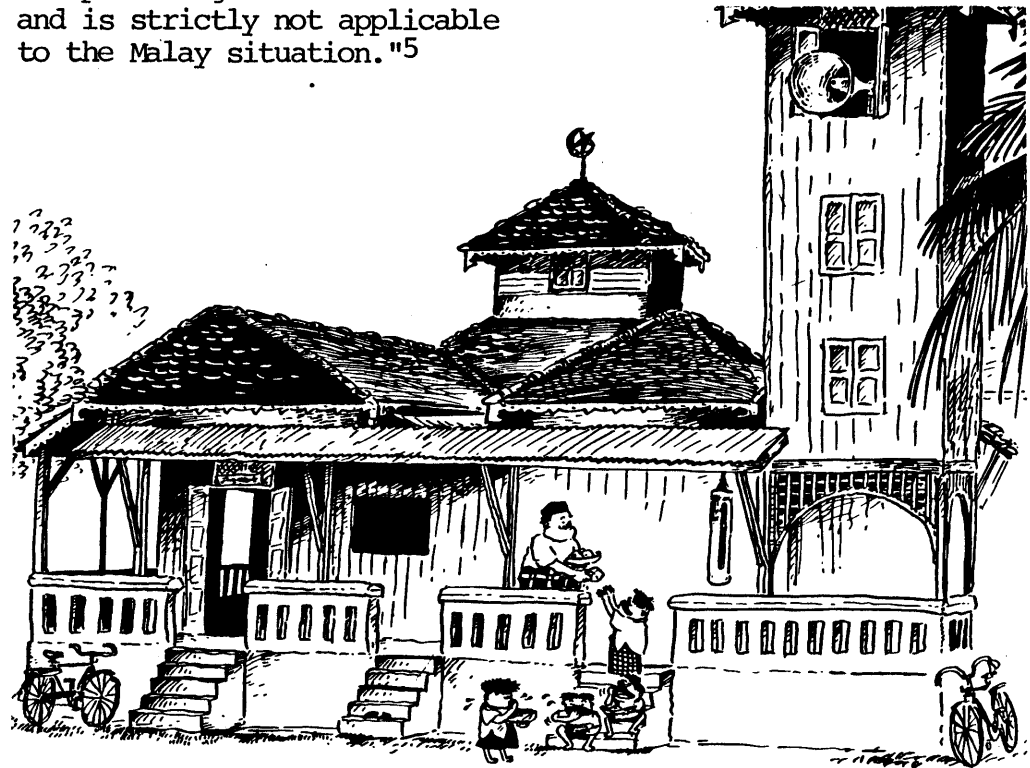
BUILT EXPRESSION OF RELIGION:

The single formal element within the Malay kampong is the mosque. Rising above the houses with its strong pyramidal form, it is the focal point of the community in terms of its physical presence, and serves as a metaphor for Islam in the daily lives of the people. It is also effective as a social organizing force by actually de-

fining the kampong. As Evers points out:

"All those taking part in the election of the mosque committee belong to one kampong, irrespective of where they actually live. The kampong is therefore in essence not a residential group in the sense of the term as defined in sociology textbooks. The definition of the village as a territorial group is based on the European image of a settlement and is strictly not applicable to the Malay situation."⁵

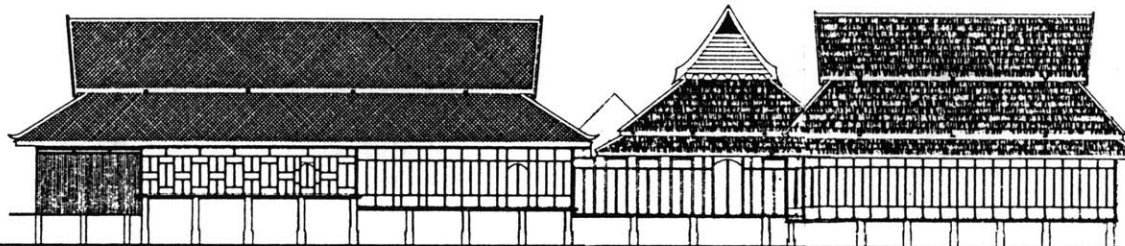
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5. 27



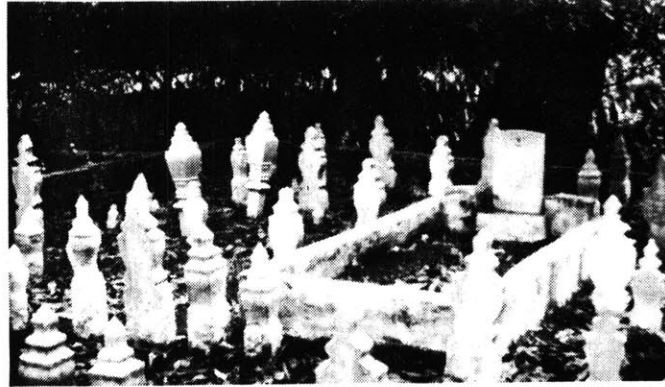
PALACE ARCHITECTURE:

The only structure other than the mosque which may be termed an institutional building is the palace. Although the primary function of a palace was ostensibly residential (the sultan's house), it also served as the seat of government. The palace as residence gives reason for its form, and the palace as institution explains its scale, for it is in actuality an enlargement and elaboration of the vernacular house. As one may look upon the form of the mosque and see it as an idealized house, so may the palace be viewed as an extension of the ordinary dwelling, differing only in the grandeur of its size and ornament.

ASSOCIATION WITH LIFE PROCESSES:

The Malay attitude toward the dead is quite different from that in the West. Although for the most part confined to a cemetery on the edge of the village, the carved stone grave markers are likely to appear in clusters throughout the village, at road intersections or in crowded marketplaces. A sixty-four year woman explained the practice in this manner:

"We shall be healthy when the graves of friends and family and memorials to the people of the recent and distant past are intermingled with our houses in small graveyards; as naturally as the dry season always comes before the harvest."⁶



5.28



5.29

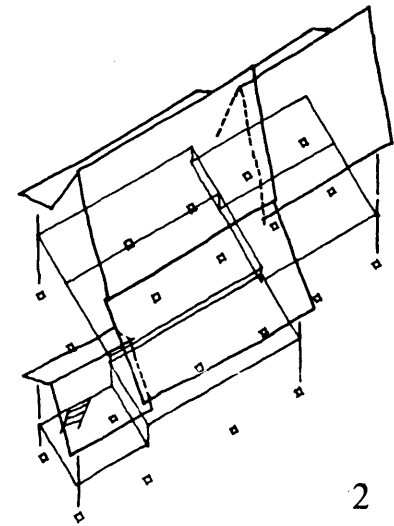
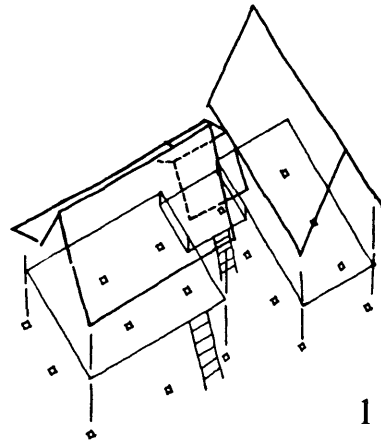
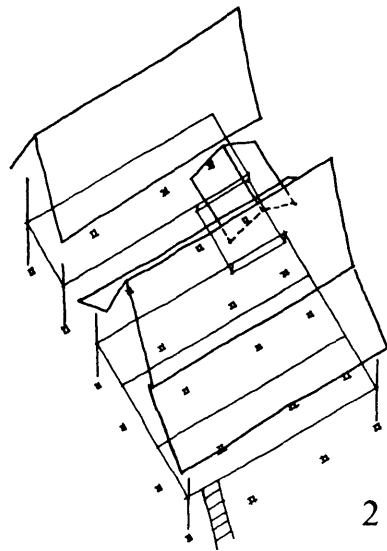
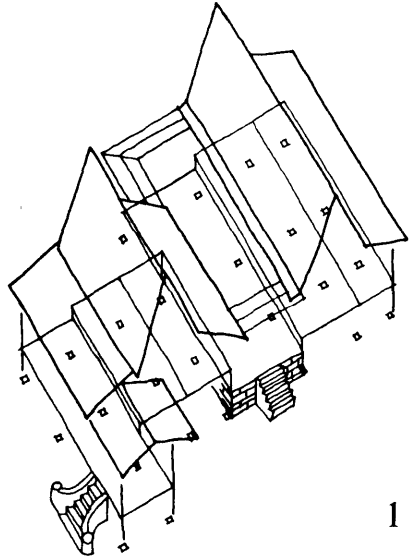


5.28, 5.29. Malay gravestones in a cemetery and in a marketplace.

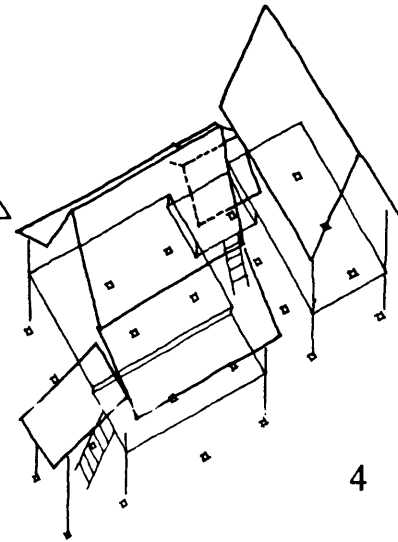
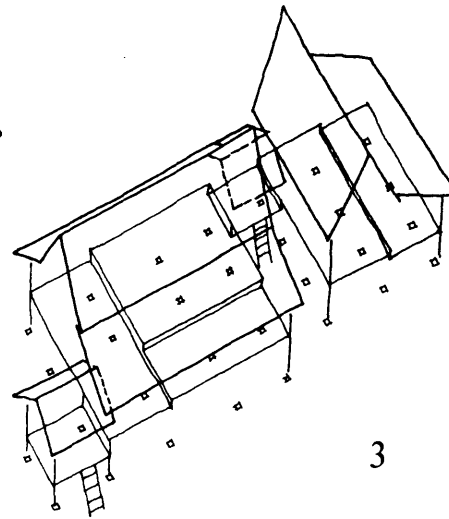
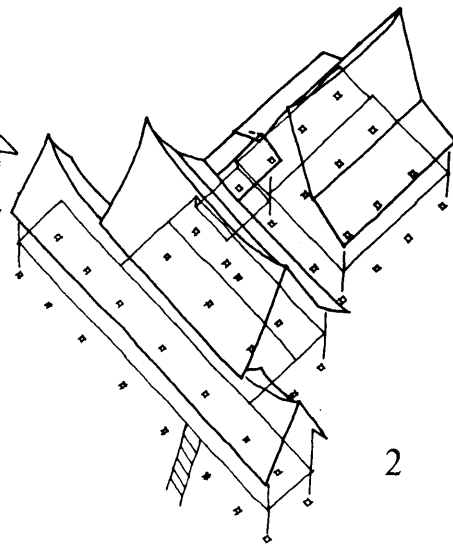
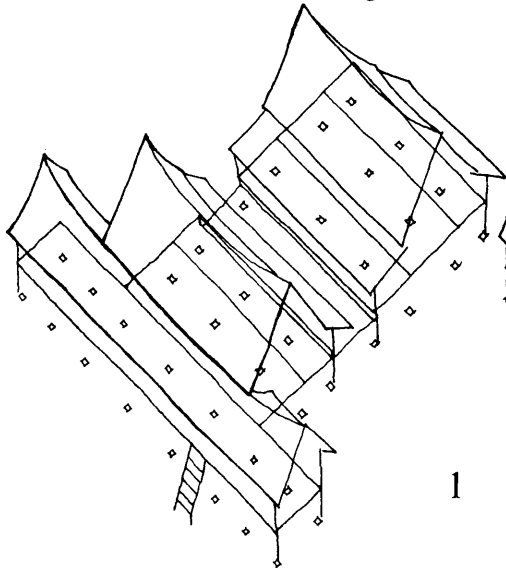
6.0. REGIONAL VARIATIONS IN HOUSE FORM (WEST COAST)

Southern Courtyard Form (Malacca)

Northern (Penang, Kedah, Perak)



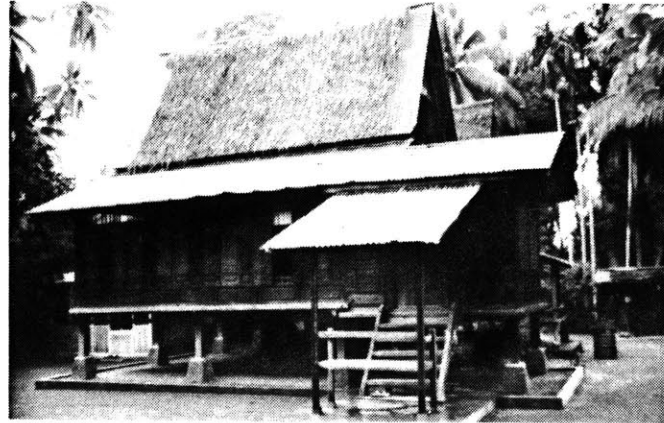
Southern Minangkabau (Negri Sembilan)



Chapter 6 : House External

HOUSE FORM:

Essentially, the Malay house is a wooden post and beam structure, enclosing a rectangular space, covered by a high pitched roof and having smaller volumes attached to it. There are a number of regional variations of this form owing to the variety of influences throughout the peninsula. Although Minangkabau settlers are credited with introducing the local style of roof to Negri Sembilan, the contributions of other ethnic cultures in the region, though acknowledged, have not been as well researched. The influence of other Indonesian groups (Bugis, Achehnese, Banjarese), as well as Chinese, Thai and Cambodian, may be observed as one travels throughout the country. Even the diverse cultures of Holland and Britain have left their mark on the Malay house.



6.1

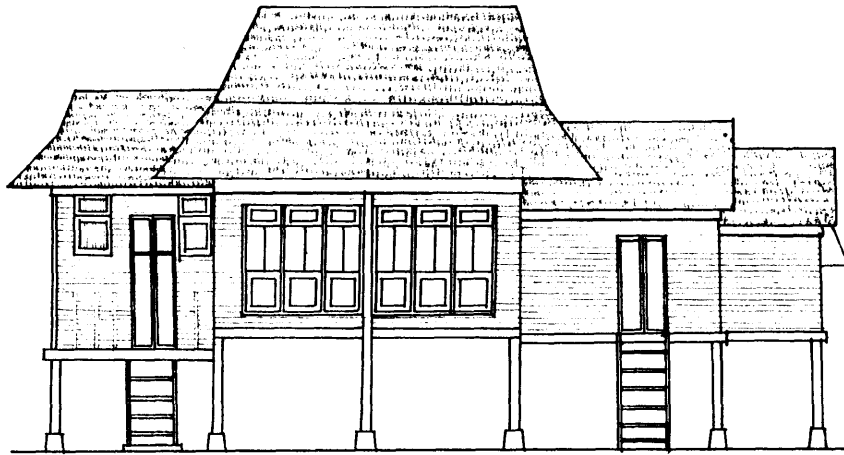


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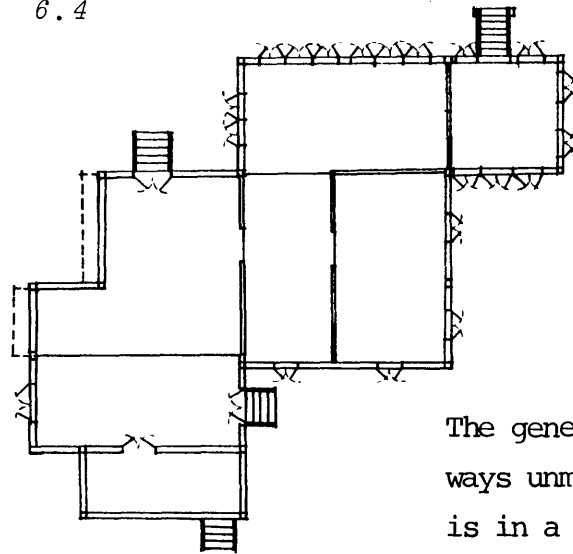
6.1. A Malacca house, c. 1890.
6.2. A house in Kuala Lumpur shows the colonial influence.
6.3. House in Trengganu, along the east coast.



6.4



6.5



6.6

The generic form of the house is always unmistakable, for the variety is in a sense rather superficial, only altering the outward appearance of the building. Spatially, the regional differences are only subtle variations on what may be called the organization of the typi-

cal Malay house. The spatial layout is quite adaptable, being able to incorporate the various additions which accompany the life of a house. A flexible building system facilitates extension by aggregate growth, relating directly to changes in the lives of the inhabitants.

6.4, 6.5, 6.6. A house in Penang.

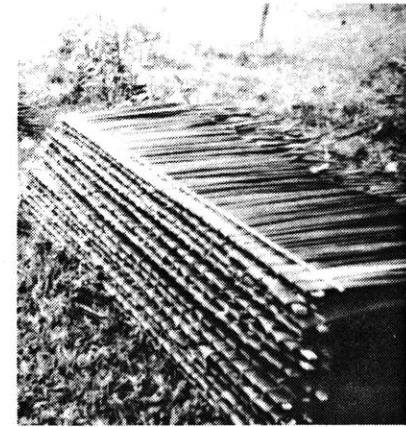
MATERIALS:

Although the form of the Malay house is, in part, a consequence of its post and beam construction, the manner in which new building materials have been assimilated suggests that technology is more a modifier and less a determinant of form. Indigenous building is defined as using locally available materials for construction, and in this instance, the bountiful hardwood forests of the Malay peninsula have nurtured the built vernacular.

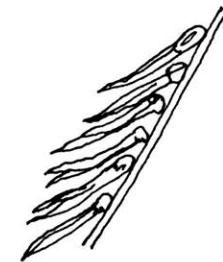
Traditionally, builders have either gone to the jungle to select the tree from which the house was to be built, or have used the wood of trees felled when land was cleared for cultivation. The leaves of the nipah were taken from swamps, cut, soaked and tied into attap, to be used as roof thatching. A hard stone, such as granite, was used

for the plinths ('pelapik tiang') on which the columns rest.

Corrugated metal sheets are now used not only for roofing material but for walls as well, and threaten to wipe out the making of attap altogether. This passing of a traditional craft is mourned only by a few old-time romantics within the kampong, for although attap is a wonderful thermal insulator and helps to keep the house cool during the day, it is constantly in need of mending or replacing (every four to seven years, on the average), provides an abode for the large insect population and is very susceptible to fires. Besides, attap making (traditionally a woman's job) is an intricate craft, not at all popular among today's youth, to whom the painstaking work of the electronics factory is far more appealing.



6.7



6.8

6.7. Freshly-woven attap (thatch) stacked for drying.



6.9

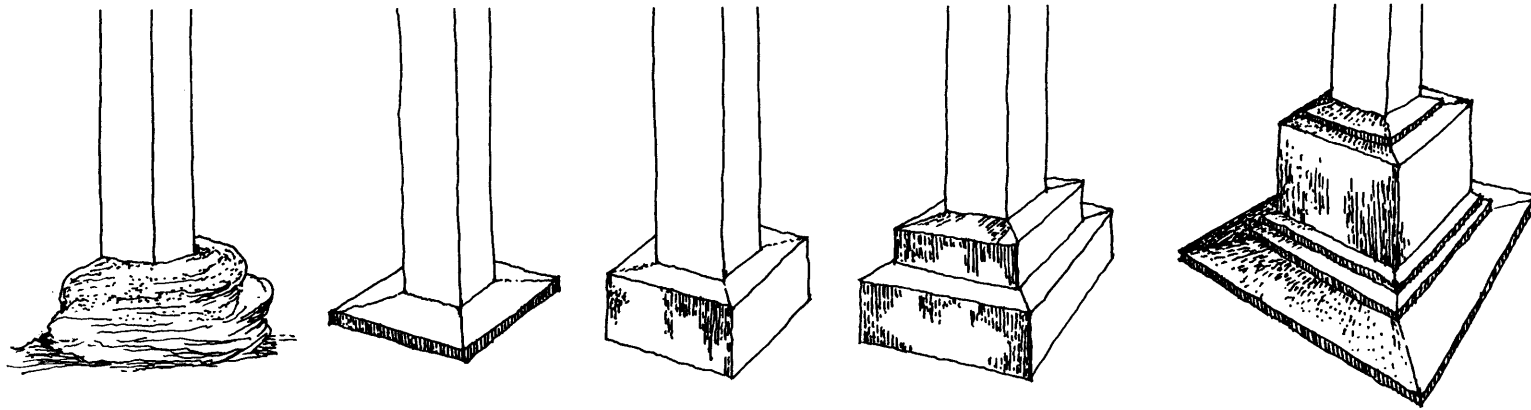


6.10

6.9. House built with indigenous materials. 6.10. Traditional construction using non-traditional materials.

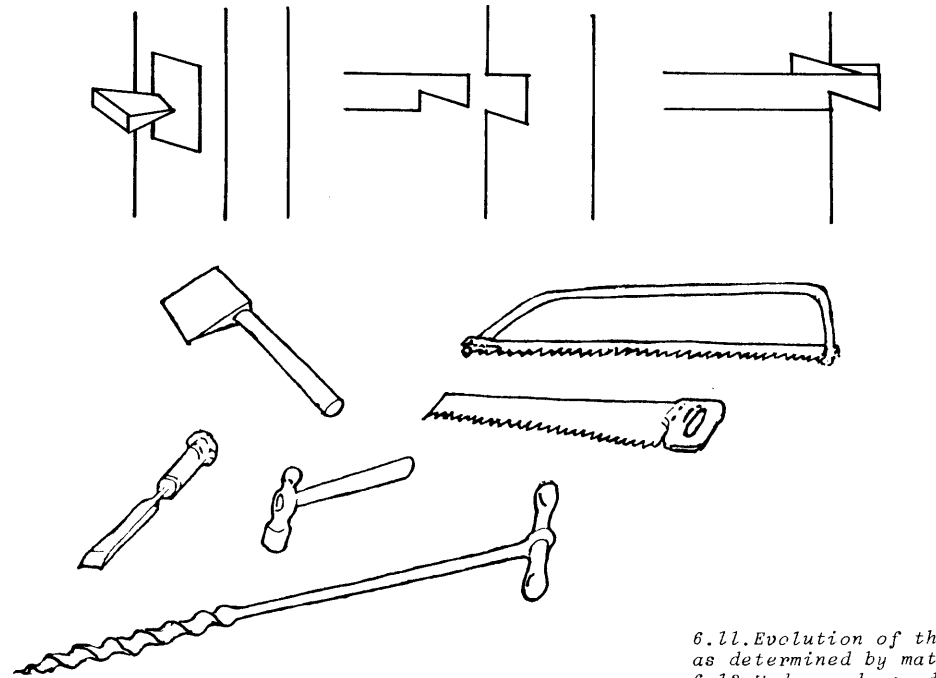
Before the introduction of bolts and nails, houses were held together using joints, wedges and wooden pegs. The coming of new technology has altered the craft of carpentry, but has not adversely affected the construction of houses. Likewise, the "pelapik tiang" is now generally moulded from concrete.

The declining popularity of traditional houses has been attributed to the prestige value attached to the "modern" concrete and masonry homes of the contemporary housing estates. But rather than a popularly-based attitude, one might suspect this to be more a consequence of government policy. Construction in wood has been officially discouraged and even outlawed in urban areas by fire codes. The codes fail to recognize that the danger of fire is due more to the local tendency to cook on an open fire than to wooden house construc-



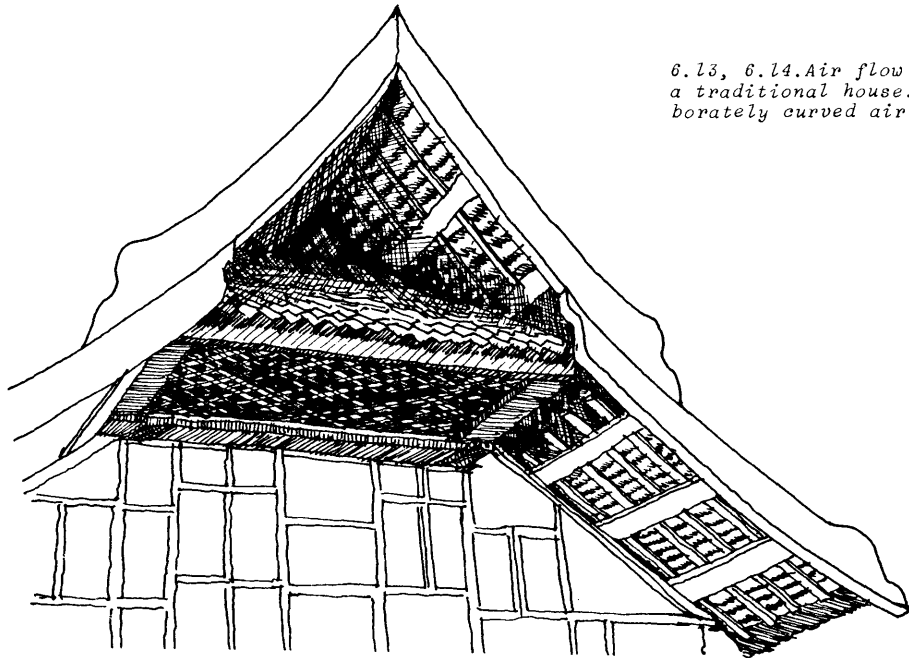
6.11

tion. If the area around the open fire (i.e., the kitchen) could be built of non-flammable material in such a way as to contain the fire, there would be no need to restrict the use of wood in the rest of the house. It is short-sighted for a country with such extensive logging operations to prohibit building with a potentially cheap and well-suited material like wood. To encourage the construction of modern wooden buildings would be to promote the continuation of a classically Malay tradition.



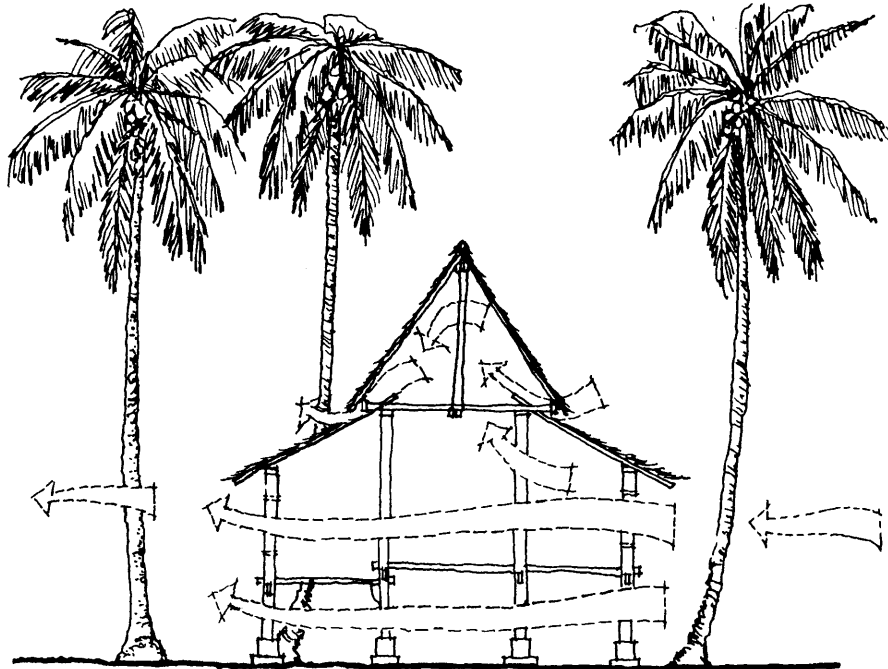
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6.11. Evolution of the plinth as determined by materials.
6.12. Wedge and peg detail and some traditional hand tools for house building.

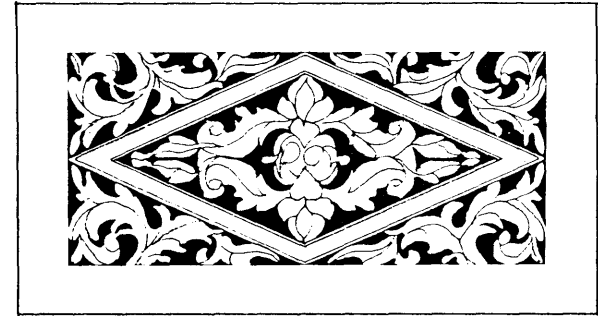


6.13, 6.14. Air flow through a traditional house. 6.15. Elaborately curved air vent.

6.13



6.14



6.15

VENTILATION:

The climate of Malaysia is marked by seasonally heavy rainfall, high humidity, and a fairly constant year round temperature (approximately 80⁰F in the shade). The intense radiation of the tropical sun creates a striking difference between shade and sun in terms of temperature and light quality. The layout of the Malay house is well suited to allow good ventilation. It is long and narrow with few interior walls, and is easily opened to the outdoors.

Construction details are also well adapted to the climate. The house

is raised on stilts, and although the reasons for this development have been cause for speculation (protection from wild beasts and flooding rivers, an historical and symbolic connection to the primordial tree house, a derivation from coastal pile dwellings, etc.) the effect is unquestionably advantageous. Surface area is increased, and the breeze passing beneath cools the house. Gaps are left between the floor planks so that cool air may rise up through the house. A row of carved wooden screens runs along the top of the exterior walls, beneath the eaves, for cross ventilation. These screens also let in diffuse light, cutting the intense glare in a way which no window can.

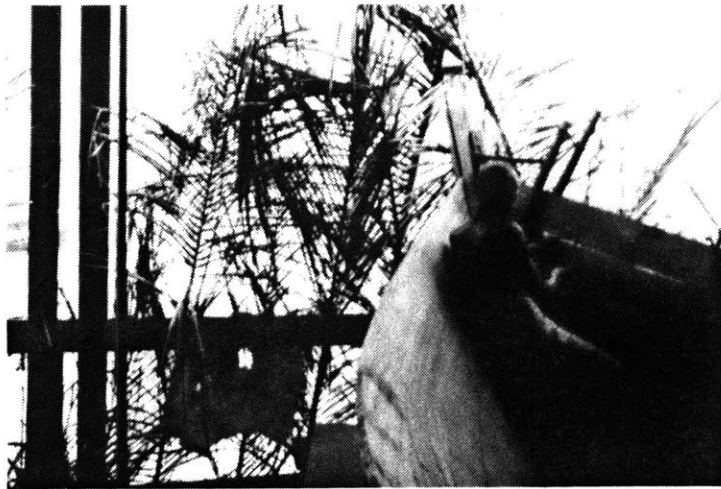


6.16

Hot air which collects beneath the ridge is vented through the gables and through gaps which are left between the layers of the roof. The low, overhanging eaves and wide verandahs offer relief from the bright sky and protection from heavy rainstorms.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Average daily max. °F	90	92	92	91	91	91	90	90	90	89	89	89
R.H. %	60	60	58	63	66	63	63	62	64	65	66	61
W.B. °F	78.5	80.1	79.5	80.5	81.0	80.5	79.5	79.2	79.7	79.0	79.2	78.0

6.17



6.18



6.19

6.18, 6.19. The curved forms of a boat (shown under construction) and a bullock cart awning are similar to the Minangkabau roof.

ROOF FORM:

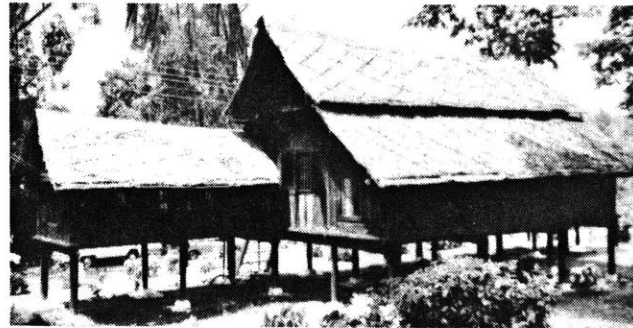
There are a number of metaphors used by Malays when describing the roofs of their houses. Some refer to its similarity to a boat, and point out the nautical terms used to describe its parts. For example, the Malay name for the gable, "tegang laya" means 'foresail.' To some, the roof is reminiscent of a "naga" or dragon, fending off evil demons. Whatever the case may be, it is apparent that such folkloric associations are very strongly held. By being so visually prominent, the roof itself has come to be representative of traditional building throughout Malaysia. When one speaks of regional variations, it is often the roof form which is the distinguishing characteristic.

The roof styles in the south of the peninsula have been traced back to their Indonesian predecessors. The

style of Negri Sembilan, in particular, is a derivation of that of the Minangkabau, brought to Malaysia by settlers from Sumatra. The distinctive feature of this roof is the graceful curve of its ridge upward toward the gables. The roof is separated into parts, usually with a large central section overlapping the smaller front roof which extends outward on either side. The deflection of the ridge turns the roof into a three-dimensional curve, giving increased rigidity, while allowing lighter weight construction. This functional aspect of the curved roof is particularly appropriate for the awning of the indigenous bullock cart, where decreased weight is an advantage. Ventilation is achieved by placing the gable end ("tegang layar") beyond the top of the wall, leaving a horizontal gap which allows air in while being protected from the rain.

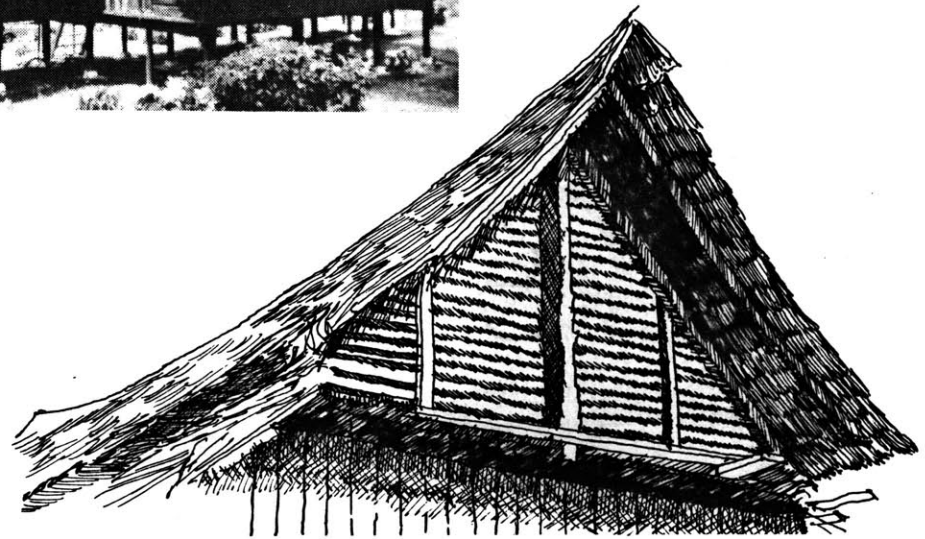


6.20



6.21

6.20, 6.21. The Minangkabau house in Malaysia. 6.22. The gable end of a Minangkabau roof.



6.22

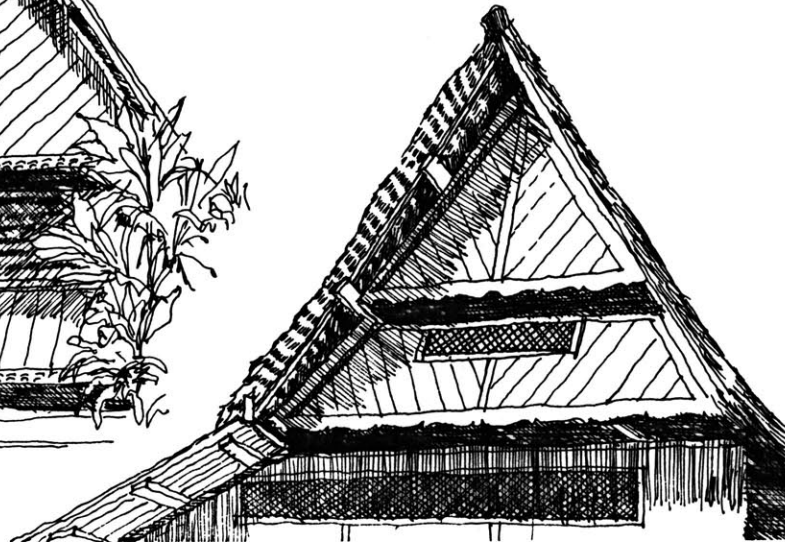
6.23



6.24



6.23. A Malacca house extended three units deep. 6.24. Gable ends of the Malacca roof.



The roof of the Malacca house is characteristically very much steeper, and has a level ridge. Decorative elements are used, however, to extend the ridge outward and upward, if not in imitation of the Minangkabau roof, then at least with similar intent. The main roof defines a building unit, and two or three of these units may be placed side by side with their ridges parallel, extending the original house to whatever depth is required. The "tegang layar" in this case is composed of two overlapping sheets, angled so as to keep the rain from entering.

In Trengganu, the gable is accentuated by the roof which extends far beyond the top of the wall. This broad overhang, however, is not for the sake of protecting the air vent from the rain, for the opening is actually horizontal, being covered from above by a small piece of roof which fits under the gable. The

opening is filled with a wooden grille which extends back to the top of the wall (see Figure 6.18).

The Kelantan roof, although similar in some respects to the Trengganu roof, does not have an opening at the gable end, and must rely upon openings at the top of the wall for ventilation. The gable is filled with a decorative arrangement of wooden strips, usually in the familiar "mata hari" (sun) pattern. Occasionally, in elaborate houses, the roof is in two parts, one raised above the other to form a clerestory which is filled with ornately-carved wooden screens. In this respect, it bears a resemblance to the roof of the traditional Malay mosque.

The roof form of the east coast is generally quite different from that of the west, often exhibiting a cruciform arrangement of ridges and having a much shallower slope.



6.25



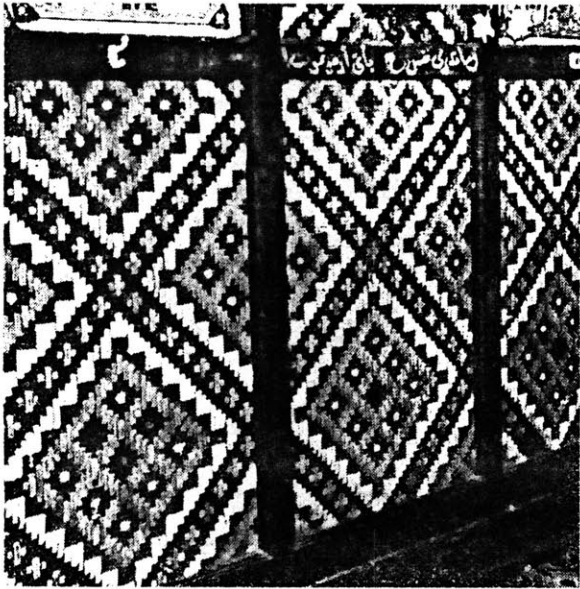
6.26

The east coast roof is covered with lightweight, diamond-shaped clay tiles which are indigenous to the area. It is perhaps due to these tiles that the shallower roof has developed, for a steep roof is only necessary when thatch is used as a covering.

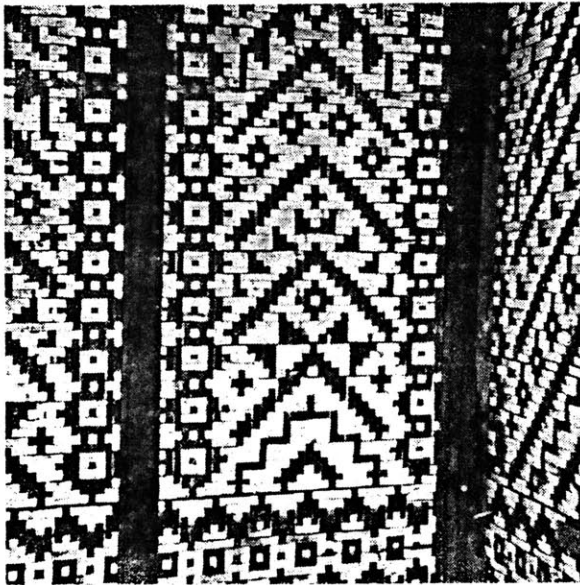
The houses of the east coast have been thought to be of Hindu origin, having been introduced from Java by the Majapahit Empire in the late fourteenth century. Their resemblance to Balinese houses has been referred to in support of this theory. Mubin Shepard, however, disputes this, presenting convincing evidence of Khmer ancestry.⁷ Thirteenth century Chinese annals describe similar buildings in the area now known as Kampuchea, and the progression of this style has been traced through Thailand and down the peninsula.

WALLS:

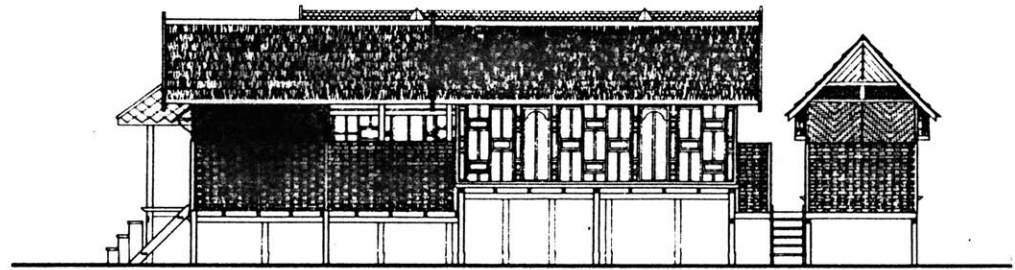
In post and beam construction, exterior walls are nonstructural, and are basically hung on the frame of the building. In the case of the Malay house, these infill walls are examples of rich ornamentation and fine craftsmanship. Two time-honored methods of building walls are by creating a composition of wooden panels, and by weaving rattan or bamboo strips into large sheets to cover the house. Rattan is woven in a variety of traditional motifs, each creating its own subtle visual texture. It is rare to find one of these woven walls in good condition in Malaysia today, for like attap roofs, they are not very longlasting and are rarely replaced, owing to their strong association with poverty. They are still quite common in other parts of Southeast Asia, such as the more remote islands of the Philippines.



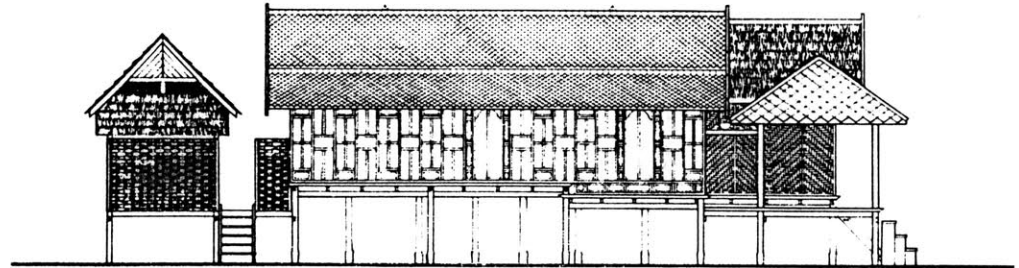
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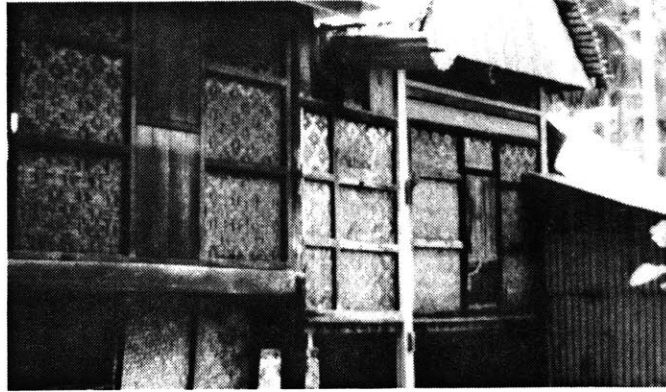


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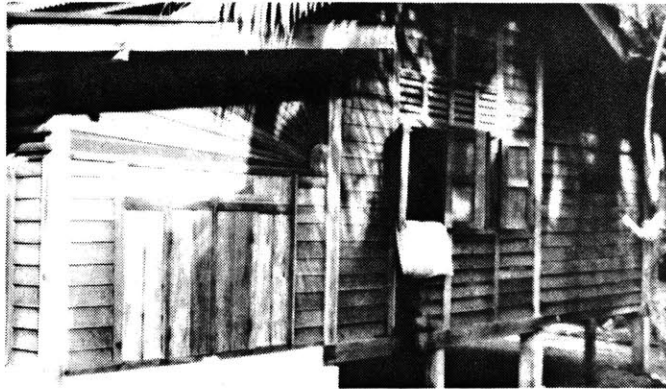


6.30

6.27,6.28. Walls made of woven rattan. 6.29,6.30.Walls built of wooden panels, in addition to rattan.



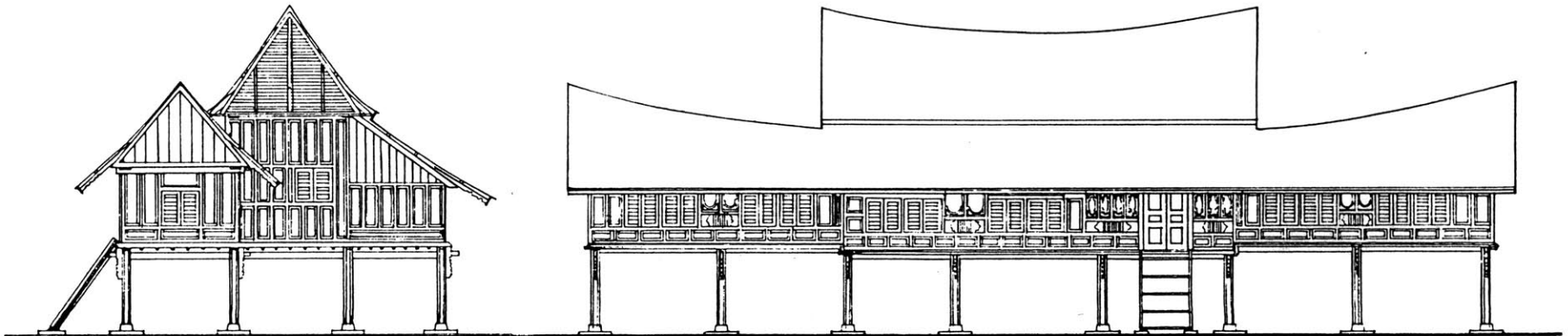
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6.32

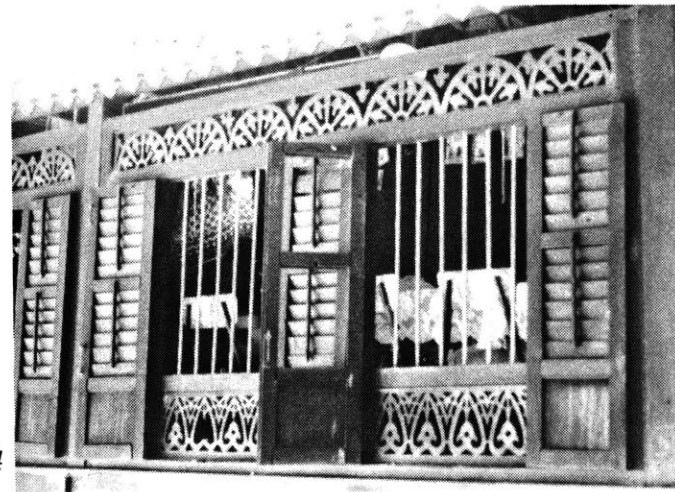
Wooden panels are much more commonly seen due to their durability, and perhaps, to their being a bit more modern, although examples may be found dating back to the mid-nineteenth century. In fact, at that time, these infill panels were quite popular among the nobility, thus lending elegance to their use, and possibly increasing their popularity among the masses. Panels may be used in a very composed manner in a wall, or they may be arranged in such a way as to express the structure of the building or the internal arrangement of space.

6.33





6.34

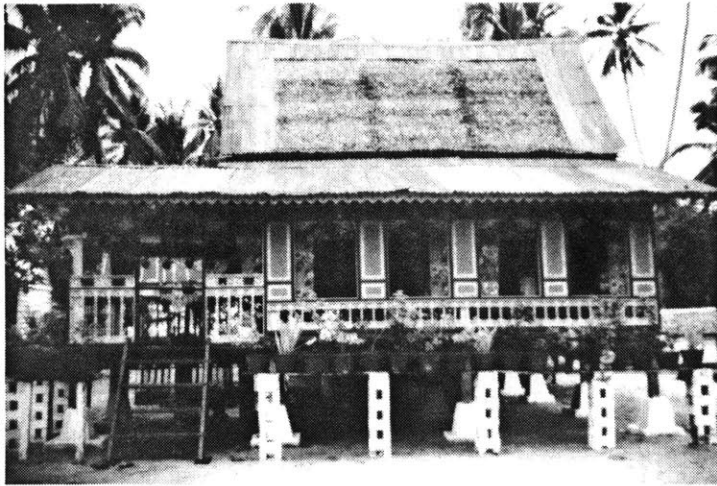


6.35

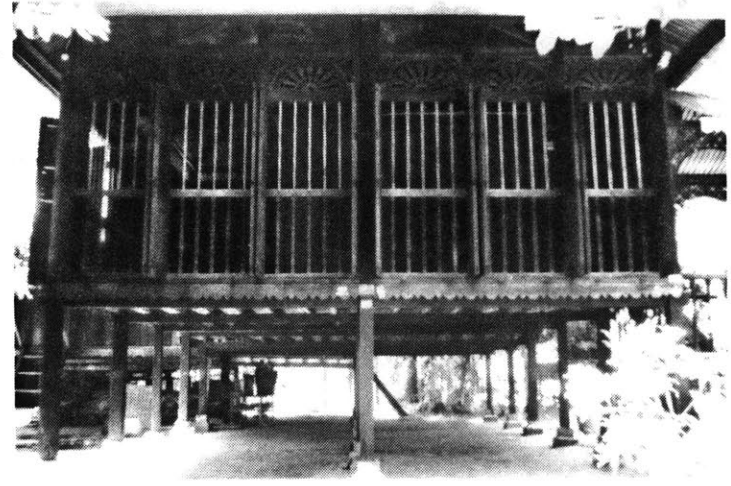
These panels become shutters where the wall opens to form windows. Windows are generally full-height with railings and balusters along the bottom for safety. The balusters are either shaped by turning or cut in fretted patterns. Shutters sometimes run the whole length of a wall, and when opened virtually remove the wall altogether, making the house very open and airy. Or with some opened and others closed, the darkness of the interior will be contrasted with the brilliant sunshine giving a feeling of cool-

ness to the house. This type of window has become standard for the Malay house, for even as clap-board siding has come into use in recent years, paneled, or in a similar fashion, louvered shutters are still used over tall window openings. The floor-to-ceiling windows provide a very strong connection to the outdoors, and work quite well in the functional sense, letting indirect light into the depths of the house, and preventing the layering of air in the house.

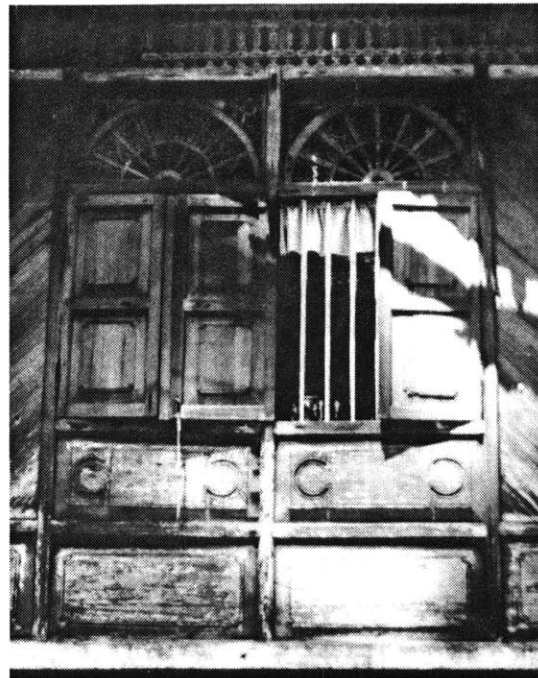
6.34, 6.35. Walls built of shutters and panels.



6.36



6.37



6.38

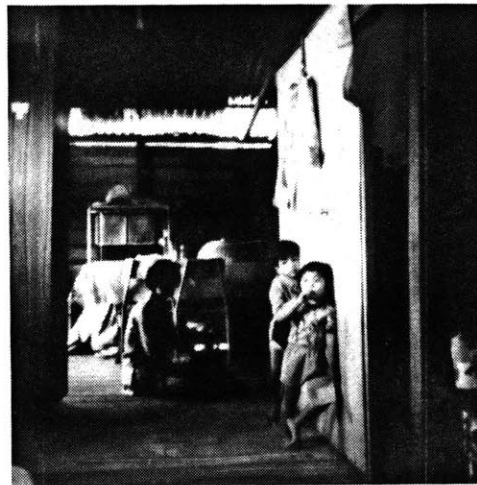
This opening of a wall rather than opening in a wall has a direct relationship with the traditional lifestyle. The Malay house is only sparsely furnished with the main activities (sleeping, eating, sitting) taking place on the bare floor or on a 'pandan' mat in the case of sleeping. There exists no innate predisposition to place things along the wall or to sit beside the wall, as is common in the West. Even in houses which now have Western-style furniture arranged

about the perimeter of the room, the occupants are as apt to sit in the middle of the floor as anywhere else. Undeniably, poverty has played a role in this cultural attitude, for as people have started to become more affluent they have begun to buy furniture as they have never been able to before. So now it might be necessary to start closing up walls at least up to the three foot high backs of chairs, for the lower parts of the walls will be much less useful, being blocked by furniture. In fact, full-height windows are disappearing in new construction, but this is more likely to accommodate the "modern" style than to accommodate furniture.

Another type of wall opening found in the Malay house is the screen, either a tracery of carved wood as is seen on the west coast, or a grille built of small lengths of wood, common along the east coast. Although



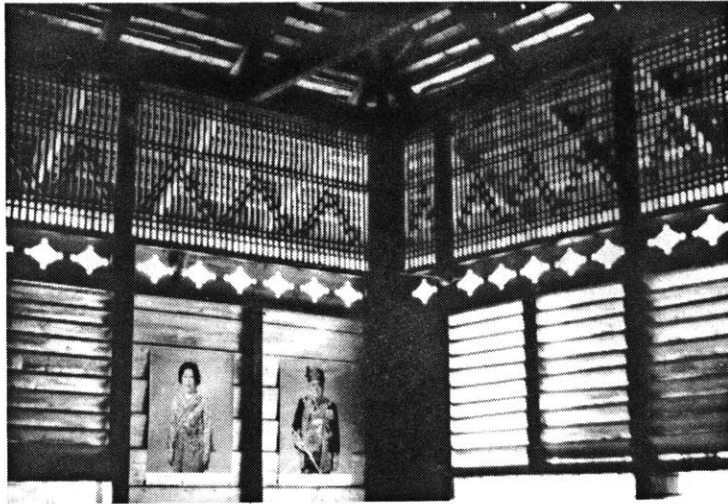
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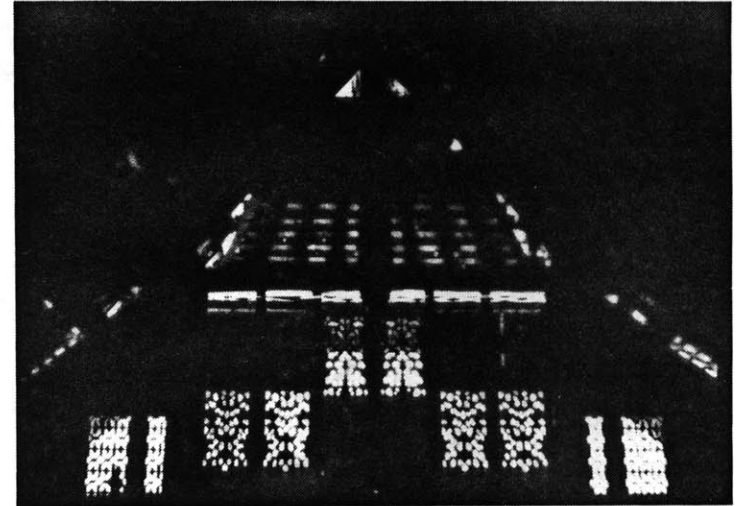
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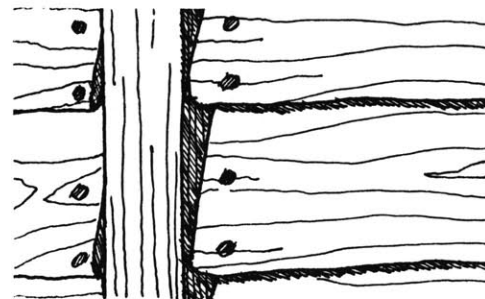
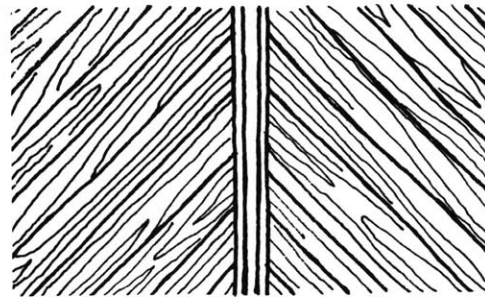
6.41



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6.44

sometimes laid in with the panels in the wall, they usually are used only along the top of the walls, where the overhanging eaves prevent rain from coming in. They are usually the most elaborately ornamented element in the house, and their beauty is best appreciated in silhouette from the shade of a dark house on a sunny day. Allowing in diffuse light is as much a part of their function as their more obvious use as air vents.

TRANSITION ZONES:

The Malay house is characteristically raised off the ground on columns. The height that it is raised depends upon the style of house, and therefore on the region. In Penang and Perak, in the northwest, there is a clearance of six to eight feet beneath the house, and an "outdoor room" is created. This space fulfills a number of utilitarian functions, but perhaps just as importantly, it plays a part in the social structure of the kampong.

The area beneath the house is usually quite active during the day, for it provides a cool, shady place where outdoor chores may be performed. It becomes a kitchen, laundry, workshop, dining area and playroom for the children and serves as a general storage space, and in recent years, as a garage. When needed, it can be walled in to



6.45



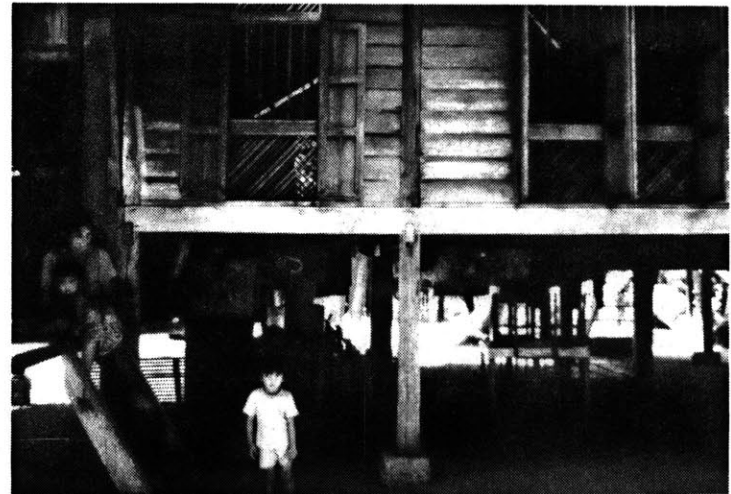
6.46

create an extra bedroom or second living room.

6.45, 6.46. The "outdoor room" as kitchen and as garage.



6.47



6.48

The social function of the "outdoor room" is rather akin to that of the verandah, or "anjong." It is a space that is distinctly defined as private yet fully open to the outside world. It is well integrated with the outward-directed way of life of the Malays, for it allows a person to be in one's personal territory and still be fundamentally involved with activities outside that territory. It is a socially well-formed interface between private and public realms, between house and kampong, between family and community.



6.49

6.47, 6.48, 6.49. The "outdoor room" completely enclosed, open and partially enclosed.



6.50

Like most front porches, the anjong is a built extension of the house. It helps to ease the passage from outdoors to inside, from the bright, noisy, public world to the cool, dark privacy of the house. It is raised off the ground to nearly the same level as the house itself, although a single step is left between it and the house to distinguish it as a place of transition. Being completely open to the outside except for the roof above, the anjong is surrounded with railings, giving a feeling of enclosure and yet leaving the outdoors accessible. Des-



6.51



6.52

pite its somewhat formal relationship to the house, it is a comfortable place to relax, to sit and watch the world go by.

6.52 The level change between the anjong and the serambi is expressed in the external wall.

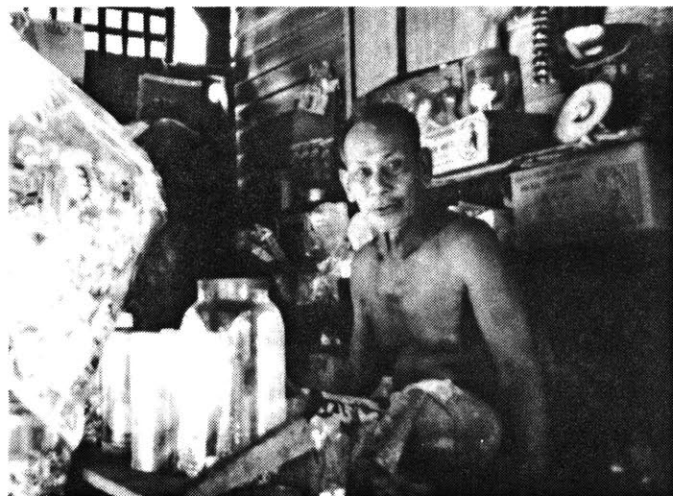


6.53



6.54

6.55



6.55 Encik Osman has converted his anjong into a small shop, selling sweets and soft drinks.

The anjong is reached by climbing a short staircase, traditionally carved of wood and often appearing to be more of an elaborate ladder, owing to its steepness and detachment from the house. A cistern of water is placed at the bottom of the steps for washing one's feet before entering. In some houses, the stairs are covered by a roof extending out from the roof of the anjong, and a built-in seat is provided at the bottom.

Near Malacca, brightly tiled steps of stone or concrete have developed as part of the local style, giving the house a feeling of being well-rooted to the earth. These brilliantly ornate stairs best exhibit the open-armed nature of the Malay front steps by showing a friendly public face and generously welcoming in all visitors.



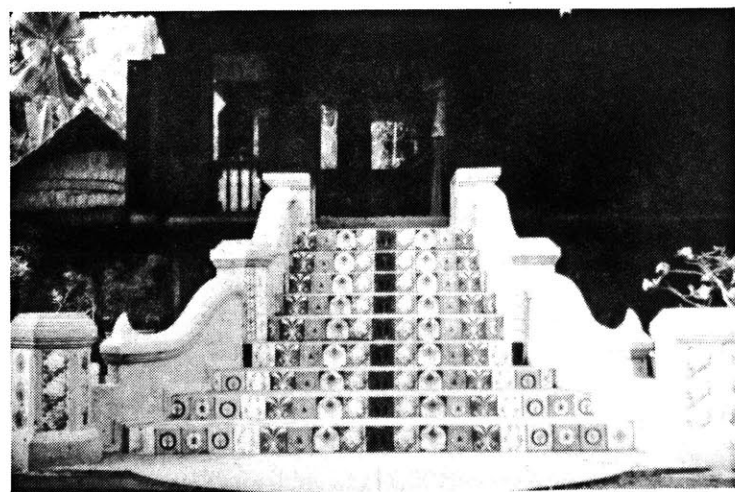
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6.57



6.58



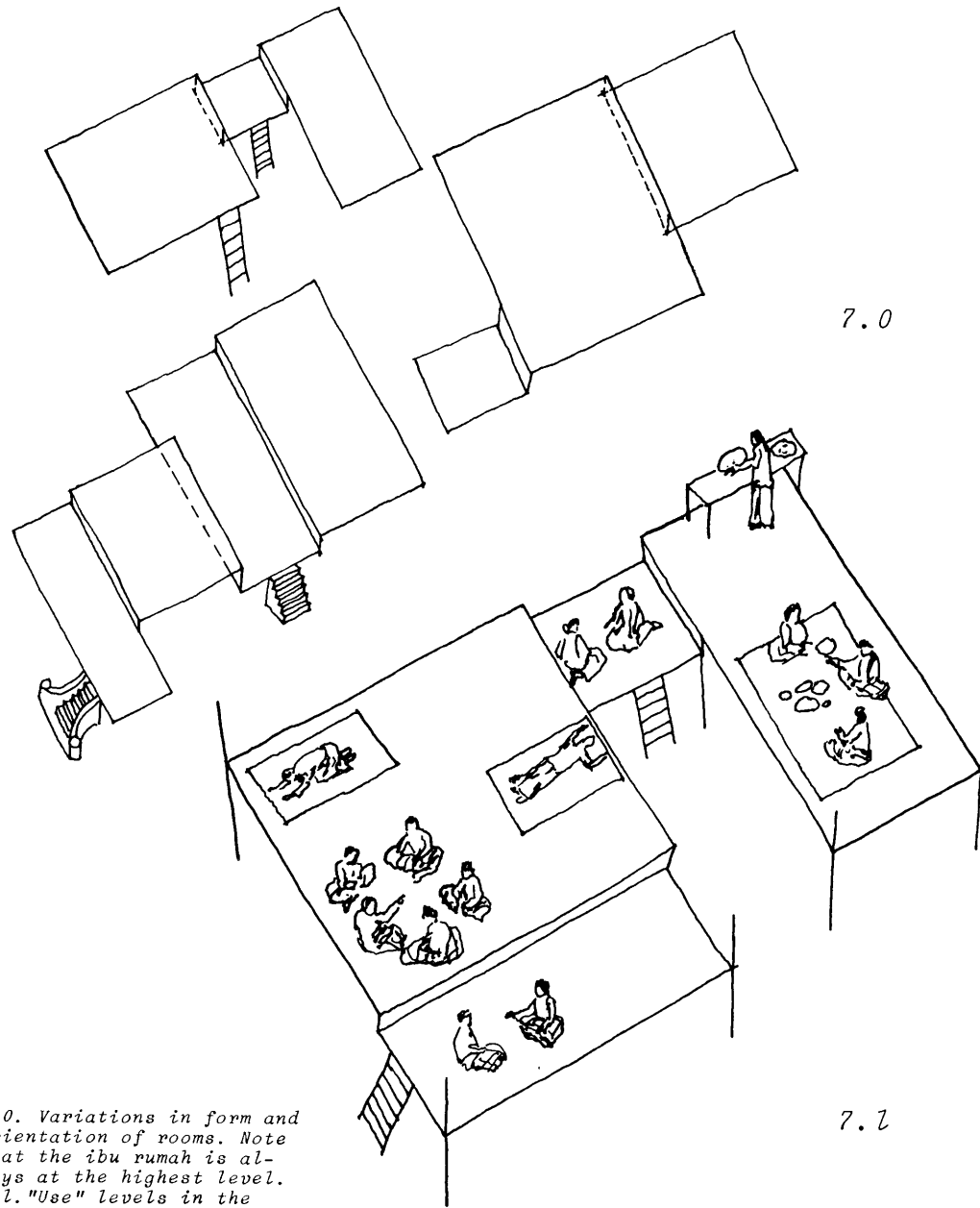
6.59

Chapter 7: House Internal

MAIN HOUSE:

Until recently, the common Malay house had almost no internal walls. Subtle level changes were used to differentiate spaces. These generally consist of single steps approximately seven inches in height, a dimension easily accommodated by the post and beam system, although probably not necessitated by this form of construction as Hilton asserts.⁸ Instead, these level changes are an expression of the incorporation of Malay customs into the buildings, for they define what may be termed a "privacy gradient" and a "cleanliness gradient."

The "ibu rumah", or "mother house", is so named out of respect for the woman of the household, an expression perhaps dating back to the matriarchal society of pre-Islamic



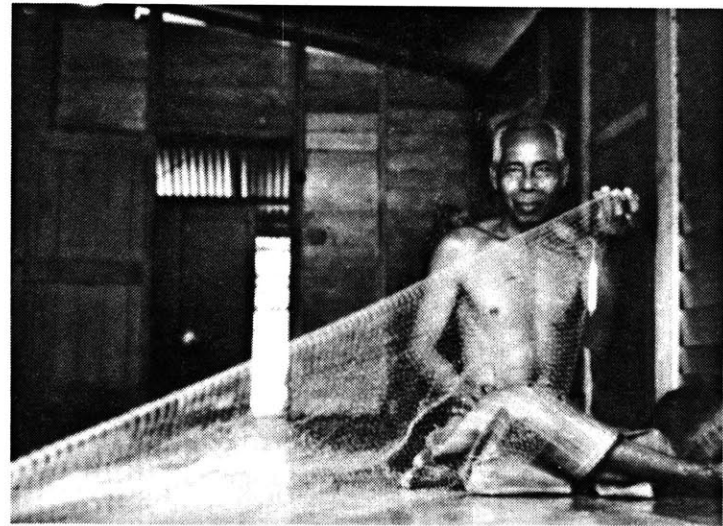
7.0. Variations in form and orientation of rooms. Note that the ibu rumah is always at the highest level.
7.1. "Use" levels in the Malay house.

times. "Ibu rumah" is the term given to the large central room, the *sanctum sanctorum* of the Malay house. It is separated from the outside by layers of space, increasingly public in character in either direction. Entering the house from the front, one must pass through the semi-public anjong and then the semi-private serambi before reaching the ibu rumah, each a step up from the other. Likewise, the back door leads into the kitchen which is separated from the ibu rumah by level changes and perhaps a short passageway.

The idea of a "cleanliness gradient" may be applied as well, for the spatial separations in the front of the house can be thought of as providing a buffer against the dirt of the street, and in the back, as keeping out the smoke and grease of the kitchen. Whether these layers of space actually function in the practical

sense to keep dirt out, or are merely symbolic, the concept is consistent with the Malay attitude toward personal cleanliness.

7.2. The ibu rumah need not have furniture to be a useful living space. A fisherman mends his net while sitting on the floor.



7.2

Directly under the main roof, the traditional ibu rumah was used mainly for sleeping, praying, sewing, ironing and other indoor activities, but on feast days (such as accompany festivals and weddings) it was transformed into a sort of banquet hall. Due to its multi-functional nature, its flexibility as a space was maintained by the exclusion of built partitions. The Malay nuclear family has always been very close, and the absence of walls in the ibu rumah was not an inconvenience. Rather, it helped to promote togetherness. Sleeping, for instance, is much more of a communal activity than in other societies. When visual privacy was necessary, curtains were used, hung on ropes strung across the room. The space beneath the high roof was kept open except for occasional lofts built for storage or as well-protected sleeping space for unmarried daughters.

Recent societal changes have encouraged the division of the ibu rumah into spaces with separate functions. Walls are used to enclose the "bilek tido" (sleeping room) or in some cases, actual separate bedrooms. A hallway is created for circulation through this part of the house. It is called in Malay "ruang tengah", or literally, "the hollow core." The term ibu rumah is still used, but it is now applied to a space that is more like a living room in the Western sense (a place for watching television, reading, etc.). This restructuring of the interior is in response to the modern emphasis on smaller households and individual privacy, as well as the shift in leisure patterns from family-oriented to self-oriented. These cultural transformations are due to an increased worldliness, even among the rural Malays, and are made feasible by growing affluence.

SUBSIDIARY SPACES:

Corresponding in function to the Western drawingroom, the "serambi" is primarily a space for receiving visitors. It is the part of the house where guests are entertained, where hours are spent talking and drinking rose syrup water. It is a space in which a visitor may feel quite comfortable and yet not compromise the privacy of the main house. This is important to the social life of the Malays, for hospitality is a significant aspect of "budi."

Like the anjong, the serambi is quite open to the outside. Often it is surrounded on three sides by shuttered windows, which, when opened, allow it to feel more like a porch with railings than a room with walls. The serambi is one degree more private than the anjong, and likewise it is one more step up.

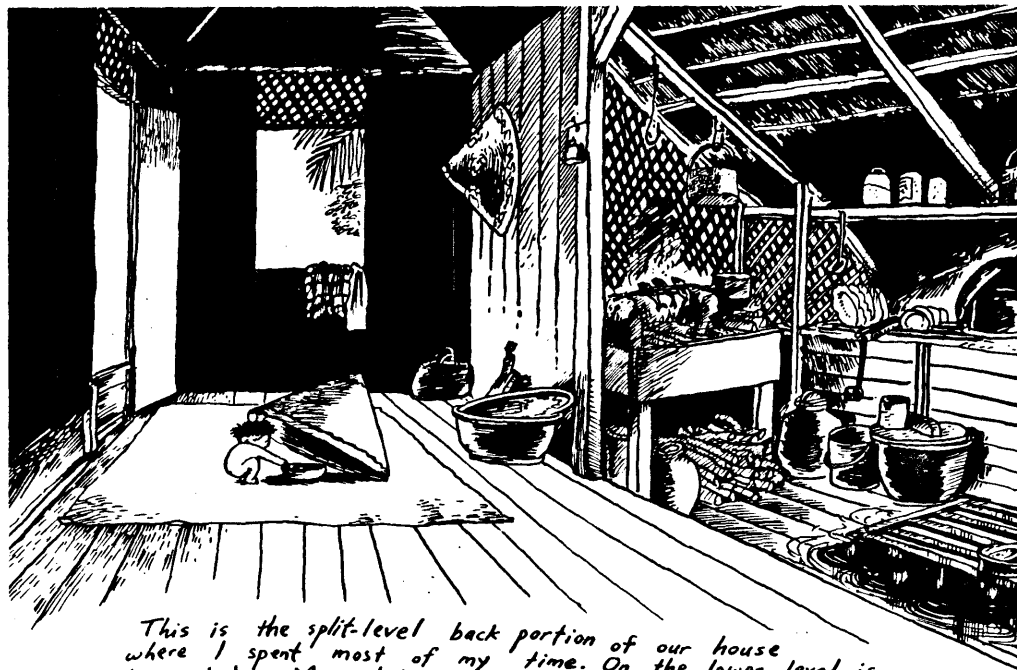


7.4



7.5

7.4. Interior of serambi.
7.5. Anjong and serambi.



This is the split-level back portion of our house where I spent most of my time. On the lower level is the kitchen. Mum did her cooking on that table.

7.6

A similar social role is played by the kitchen ("dapor") in the back of the house. As the woman is bound by custom to the kitchen, it is there that she will entertain guests who call during the day. The kitchen is normally a very busy place, for it is where meals are taken and in some homes where other household chores are done. It serves as the informal "backdoor"

to the house, and as such often gets more traffic through it than the front entrance.

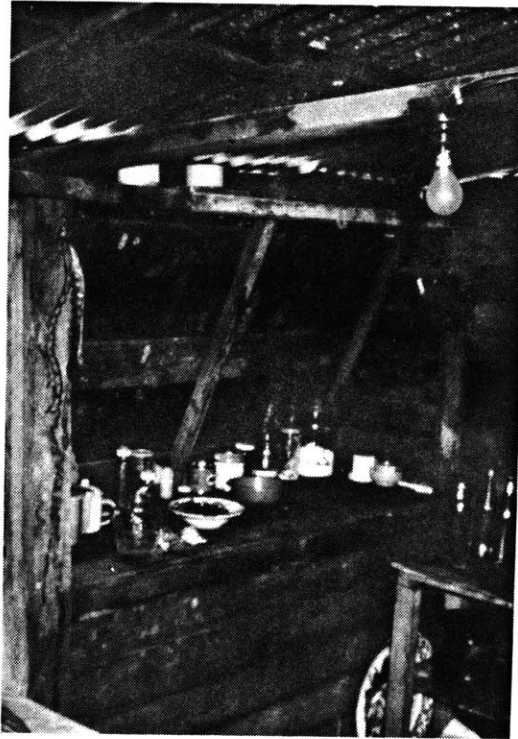
The kitchen is one level lower than the ibu rumah, and in some houses (particularly in Penang) they are separated by a short passageway called a "selang," in which case, two level changes may be introduced. Although lower than the main house, the kitchen was traditionally raised on stilts as well, but in recent years many kitchens have been built right on the ground. Reasons for this may be the incorporation of better drainage systems (previously, water was poured through gaps between the floor boards and absorbed by the ground below), the accessibility to the outdoors (where some cooking is done), and a preference to having earth beneath the charcoal brazier rather than wood (for safety).

In older houses with raised kitchens,

an outdoor deck is built off the back of the kitchen. It is a place to wash utensils and to let them sit in the sun to dry. In a formal sense, the back porch is to the kitchen what the anjong is to the serambi.

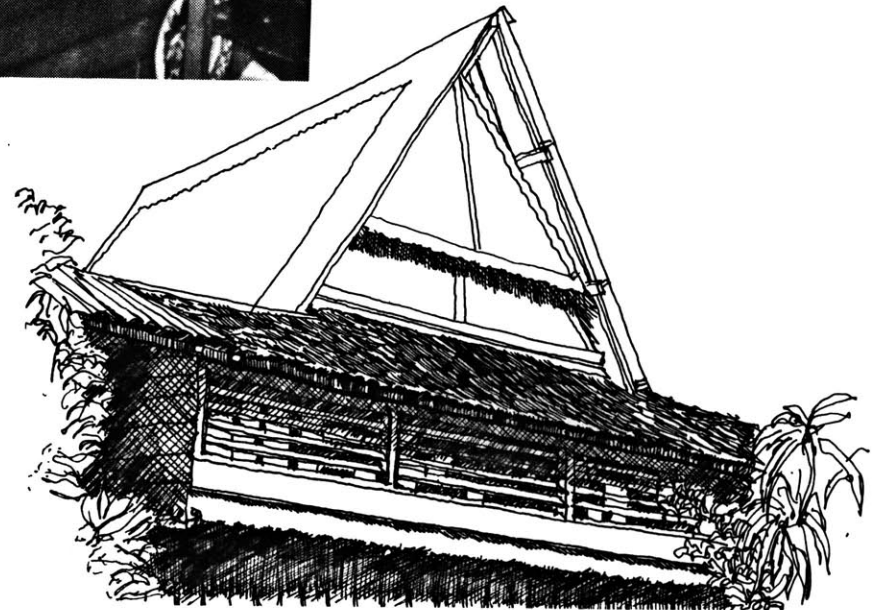
Dishes and other small utensils are stored on a shelf built into the outside wall of the kitchen. By its design, this shelf ("para") responds well to the problem of drying dishes in an extremely humid climate. It is built beyond the outside wall (although accessible only from the inside) and covered on the exterior by a small piece of sloping roof. The horizontal surface is a wooden grille which allows air to rise up below the dishes. It is both an effective drying rack and an efficient storage space.

The toilet and the bath are never in the same room, and, traditionally,



7.7

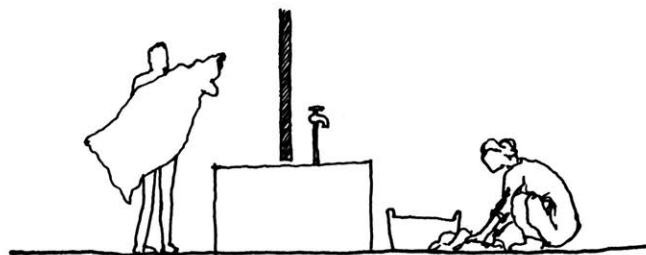
7.7.,7.8.The para, a shelf for storing dishes.



7.8



7.9



7.10

7.9, 7.10. Toilet and bathing facilities, old and new.

are always detached from the house. The toilet (usually a pit latrine) is surrounded by walls of nipah leaves, forming an outhouse. Bathing facilities are sometimes in similar freestanding structures built around a well or a trough of water. Water is taken out in small bucketfuls, and splashed upon the body. A private enclosed bath is not a necessity, however, for it is customary for Malays to bathe while wrapped in a sarong, making it possible, and socially acceptable, to bathe in the open by the village well.

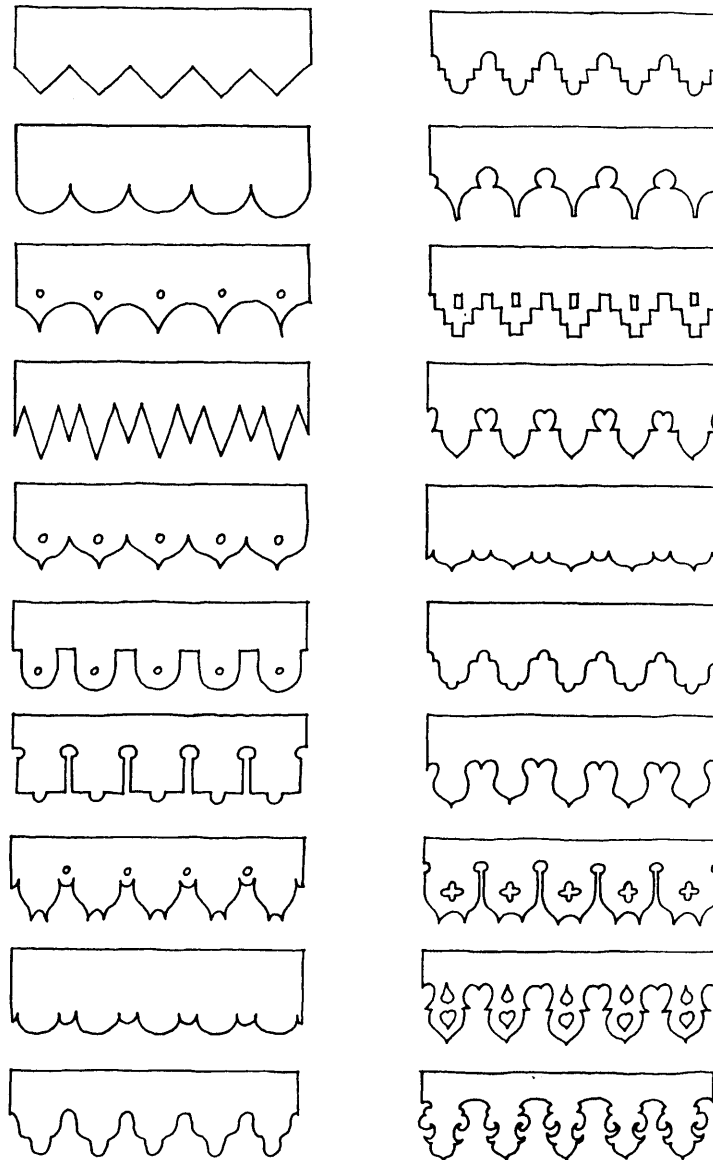
As plumbing has been introduced to individual houses, it has become standard practice to place the toilet and bathing facilities adjacent to the house so as to consolidate plumbing. They are usually placed back-to-back sharing a wall with the kitchen, so as to form a service core.

ORNAMENTATION:

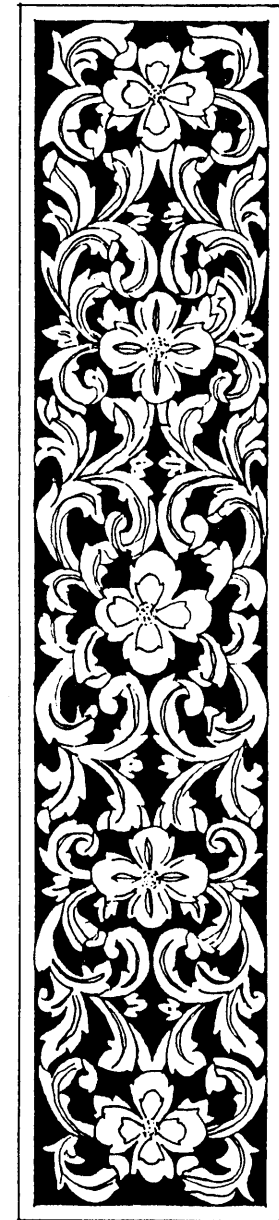
The embellishment of the Malay house takes the form of finely carved wood, and, as such, it is an enhancement of the design. Decorative details are derived from stylized architectural elements rather than added on as ornament for its own sake. Therefore, there is always a utilitarian basis for ornamentation. A prime example of this is the wooden screens used to let in light and air. They are, in many cases, the most intensive use of ornament in the house.

Although houses are generally more decorated in economically well-off kampongs, certain features will always be embellished to some extent. One such detail is the decorative fascia board. It runs the length of the floor and roof and is seen in silhouette from the interior. Its visual function is to soften the

Decorative Fascia Boards

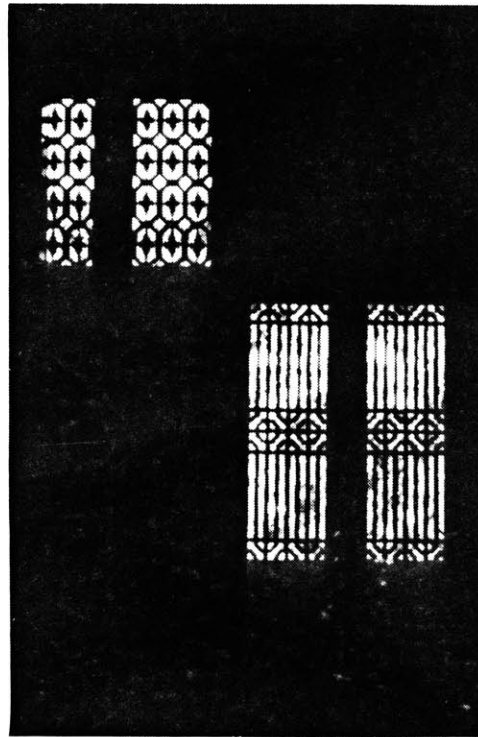
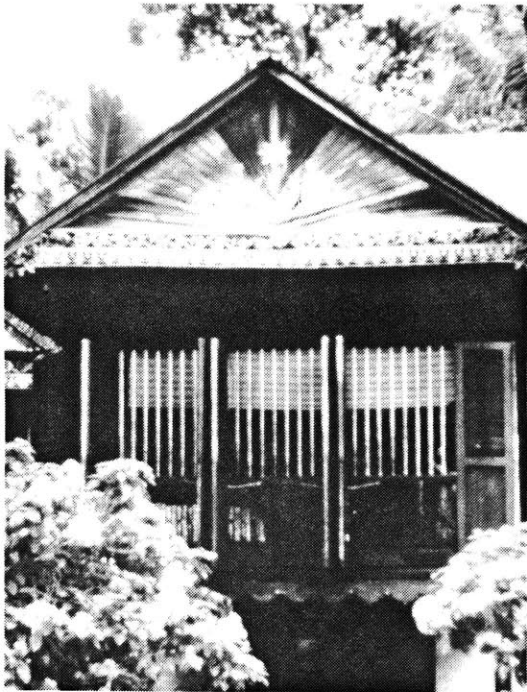


7.11



7.12

7.14. Islamic symbols appear in gable ornament.

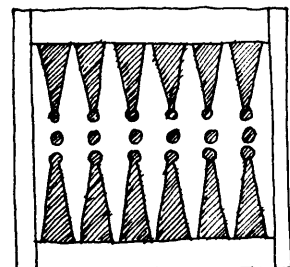
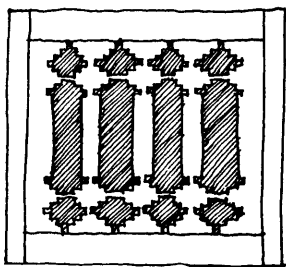
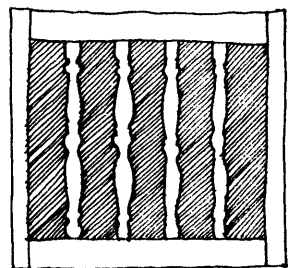
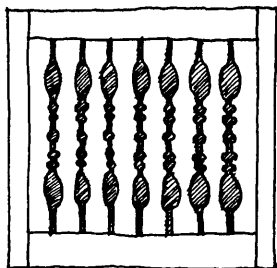
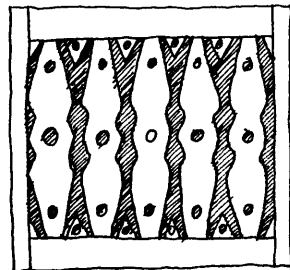
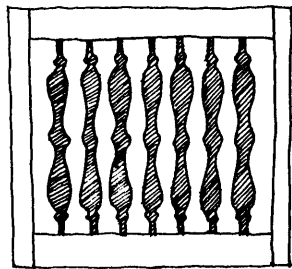


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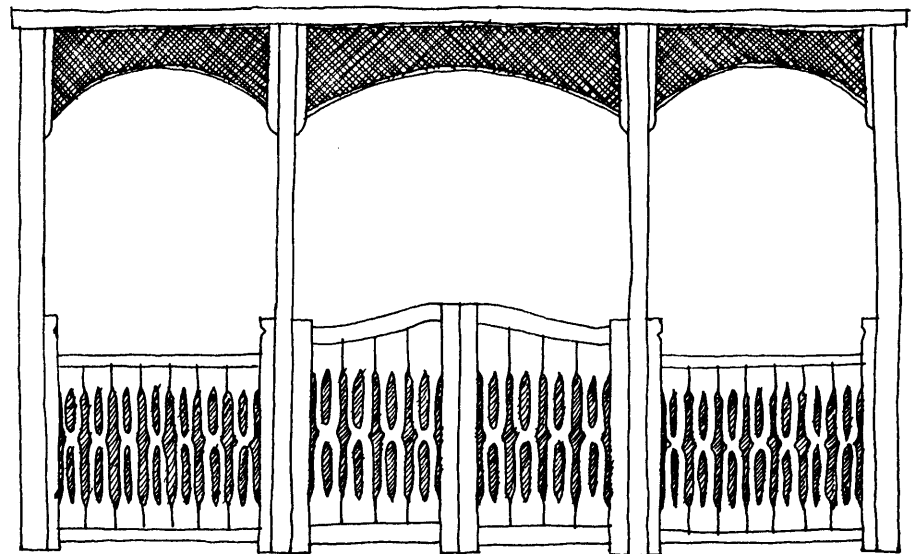
edge between the dark interior and the bright sky. The intricately carved pattern diffuses light in much the same way as the screens, giving a more comfortable border to the view from the window.

The designs themselves are usually inspired by observation of local flora, and have become stylized over time by the nature of the medium. As such, they often appear to be purely decorative rather than representational of natural elements. Perhaps this is also due to the influence of the non-figurative tradition in Islamic design. The syncretic character of Malaysian culture is apparent in ornamentation found on Malay houses. One may see instances of Indian, Arabian, Chinese and Western motifs mixed in with more traditional Malay or Indonesian details.

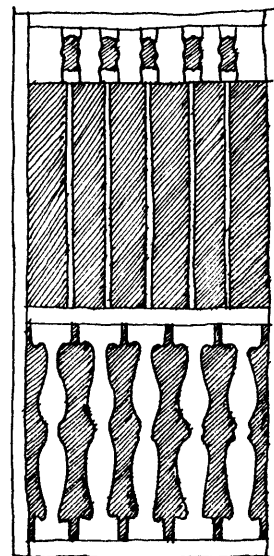
BALUSTRADES AND RAILINGS



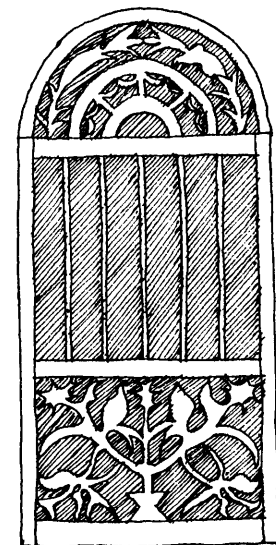
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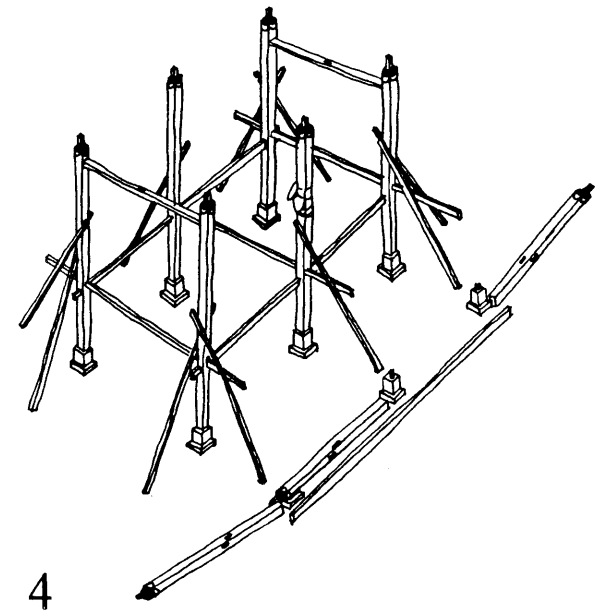
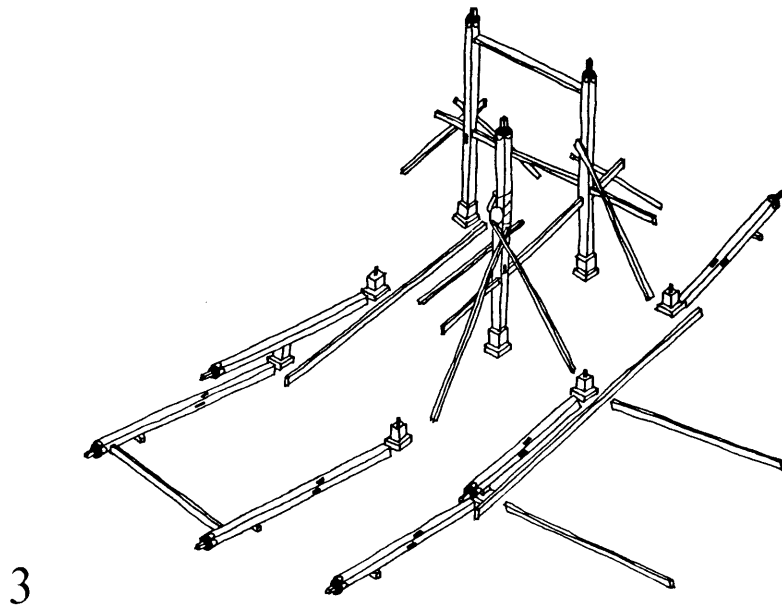
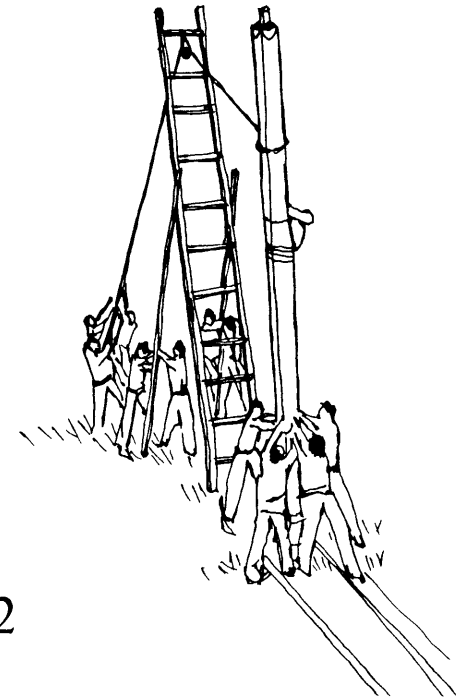
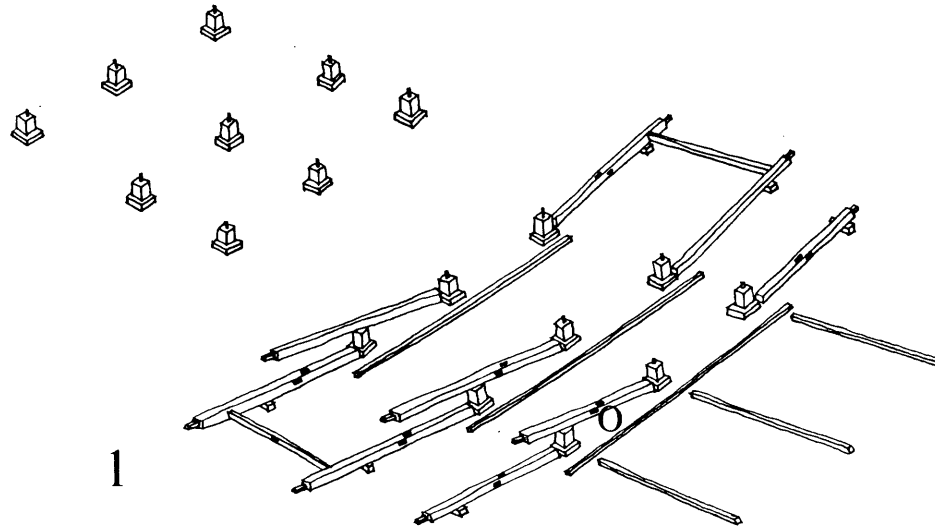
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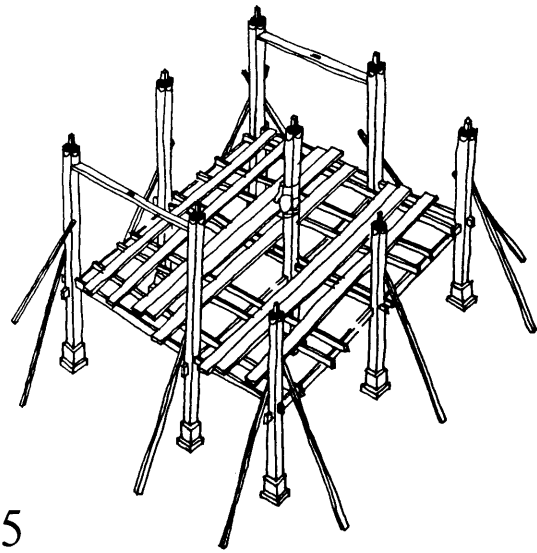


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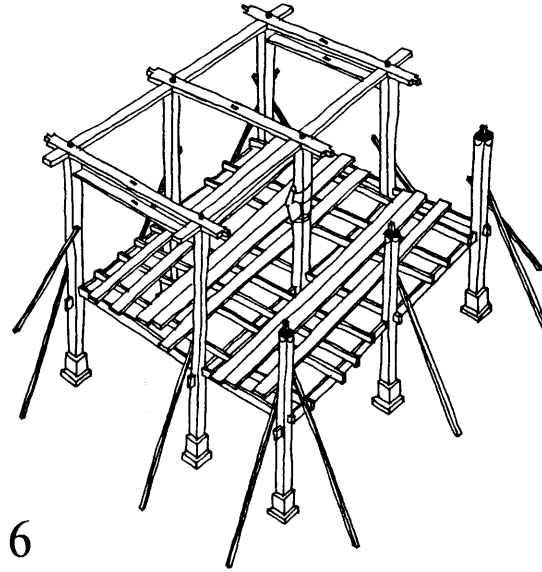


7.18. SEQUENCE OF CONSTRUCTION

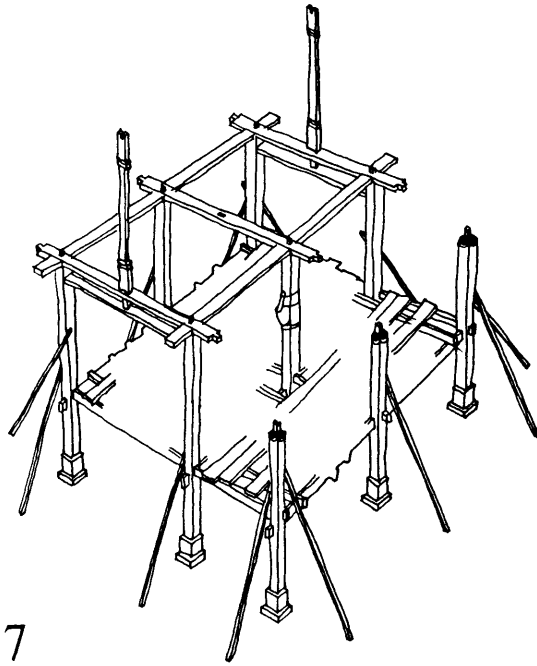




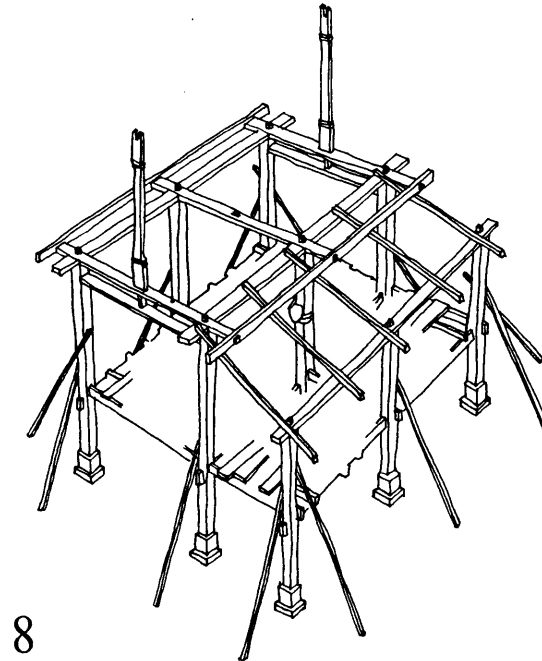
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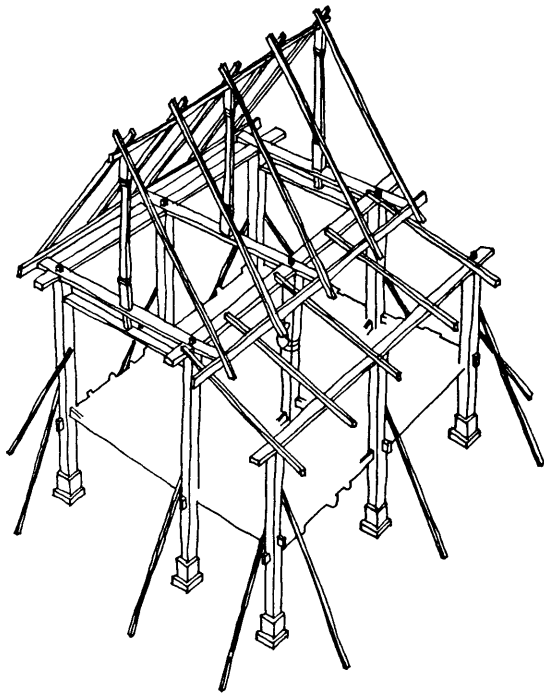
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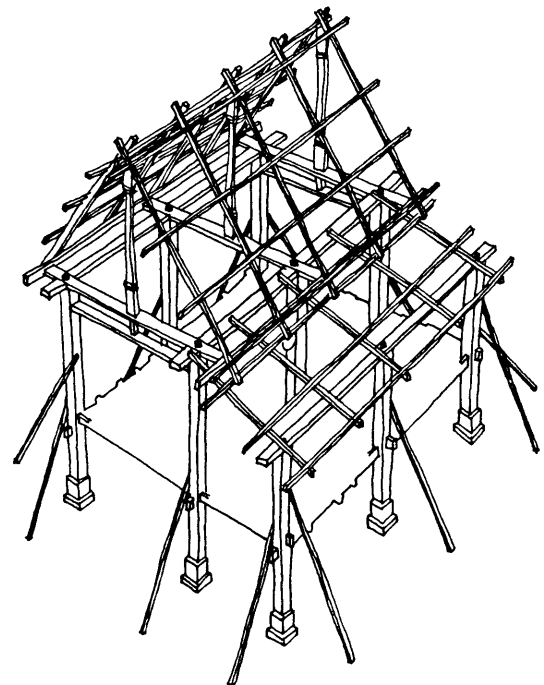
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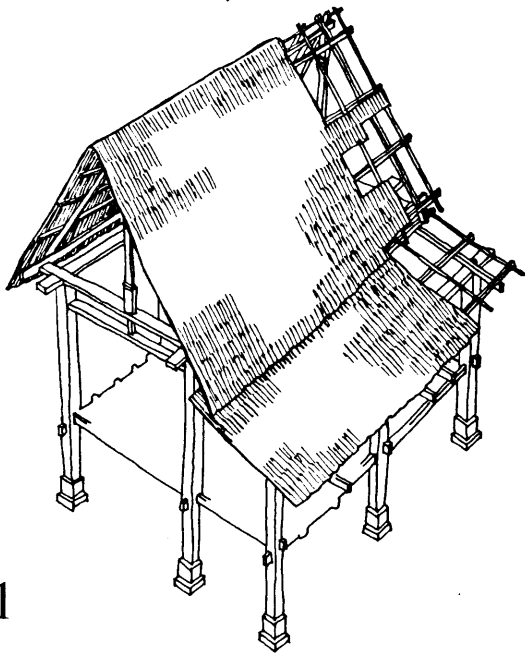
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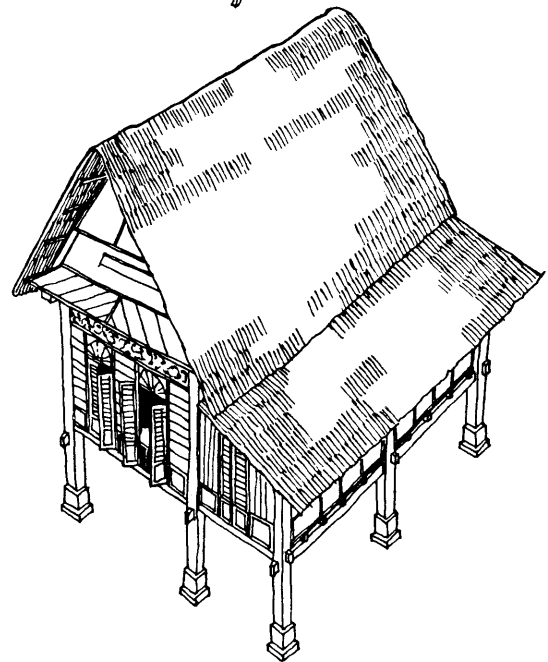
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10



11



12

CONSTRUCTION:

Building a house usually involves the whole community, or at least, the extended family. The concept of "gotong-royong" or mutual cooperation is a root principle of Malay society, and when applied to the task of building, can overcome many of the more complex tasks. Cooperative building ensures a consistency of structures within a kampong, and promotes a continuation of traditional construction methods. At any house raising, there will always be a few experienced old timers and a few newcomers. In this way, knowledge of the building crafts is passed along from father to son, mother to daughter, and from master to apprentice. Without this form of practical training for the youth of the kampong, the tradition would be lost, for like most vernacular construction, no plans or drawings are used.

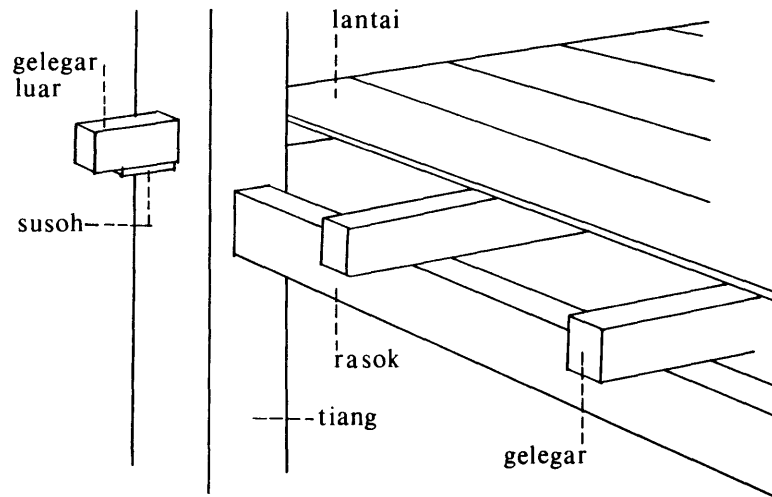


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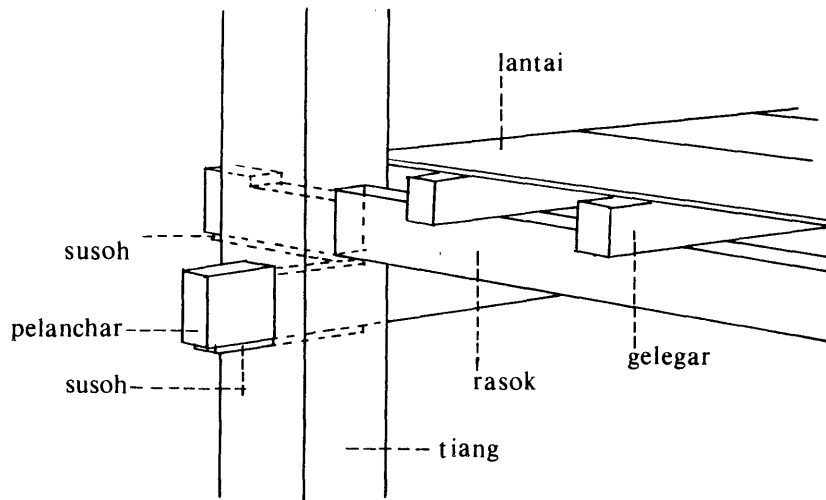
With so many people working on one building, construction can only be efficient if parts of the house are prefabricated. Such pieces as roof trusses and infill walls are assembled separately from the rest of the house, allowing one group of people to be building the roof trusses while another is working on the structural frame. The house itself need not be built *in situ*, for it is not anchored to the ground. In fact, it is not uncommon for an entire house to be picked up and carried to a new location to avoid

7.19. "Gotong royong" applied to construction; erecting a neighbor's house.

7.20



7.21



7.20, 7.21. Two methods of floor construction.

impending danger, such as floods or fires. This is another example of "gotong royong," for it usually requires all the men of the village to lift and carry a house.

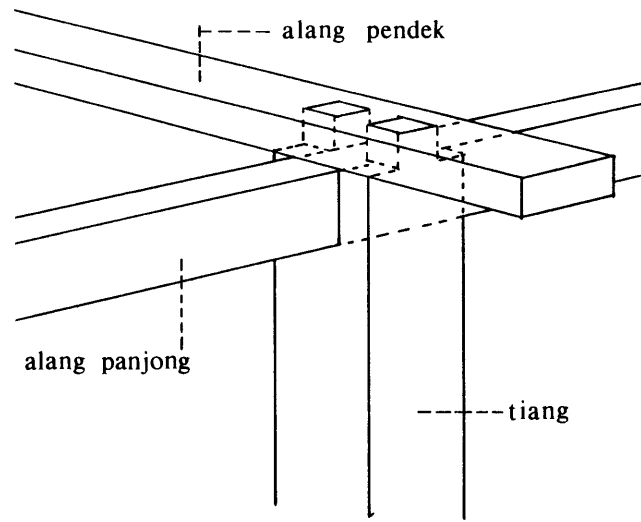
CONSTRUCTION DETAILS:

The building frame is erected first and placed upon the "pelapit-tiang", or plinths. These traditionally were carved out of laterite or granite, but are today commonly cast of concrete. It is important to avoid contact between the ground and the wooden frame so as to keep the wood dry and free from rot, a serious problem in the humid tropics. The plinths also hinder the advance of termites, another hazard to wooden structures.

Hardwood columns (approximately five or six inches square) are laid out in a rectangular grid. The distance between columns is generally in

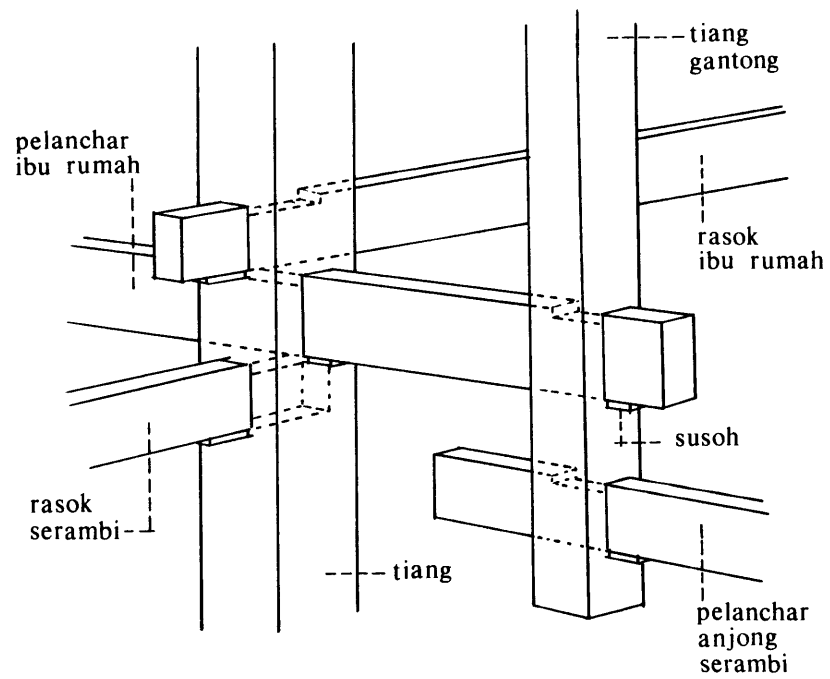
the range of nine or ten feet. Floor beams (approximately 3" x 5") are laid out in a rectangular grid. Floor beams (approximately 3" x 5") are passed through slots in the columns and secured with wedges or bolts. Roof beams (approximately 3" x 2" laid flat) are notched and pegged to the tops of the columns. In this way, a rigid frame is built. The floor is constructed of 2" x 3" joists with planks laid across them, and secured with wedges (or nails) at the ends.

The main roof is built with a series of king post trusses supporting a continuous ridge. Purlins are laid parallel to the ridge to give rigidity to the roof and to hold up the rafters. The main function of the rafters is to provide a place to tie the attap (thatch) or nail the sheet metal. As the trusses are triangular in form, tied across the bottom with a piece

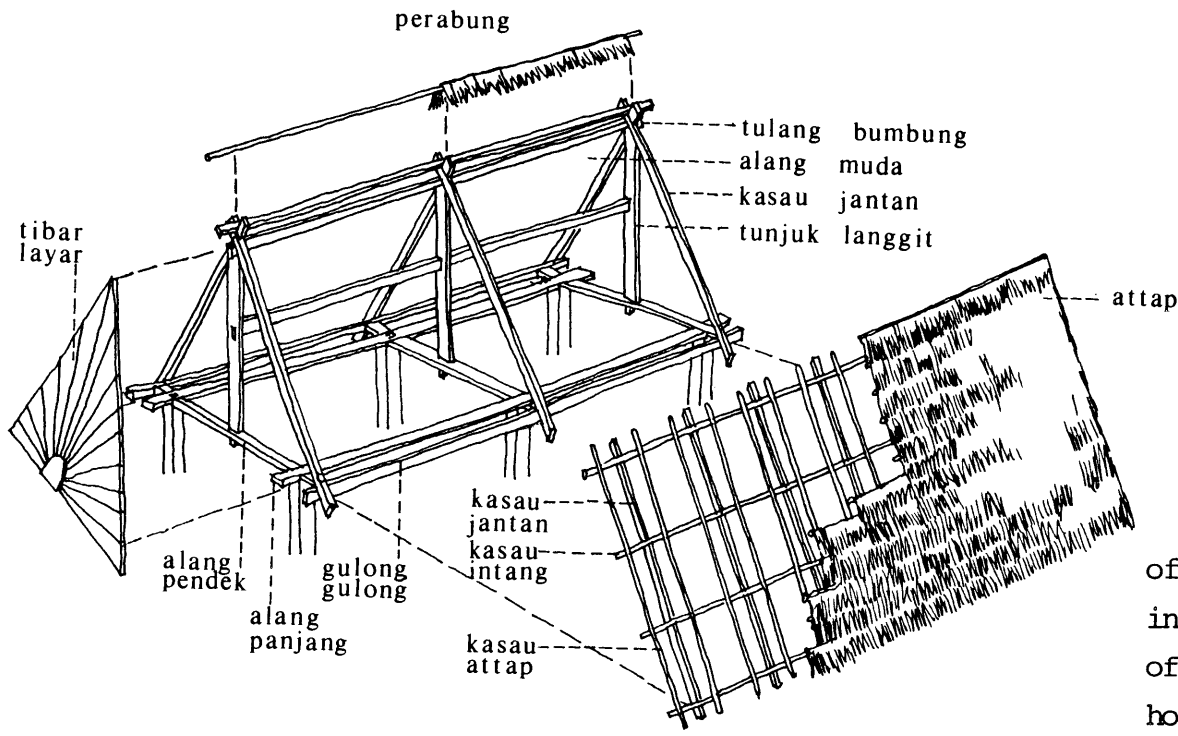


7.22. A common method of joining tie-beams to the top of a column. 7.23. "Flying pillar" construction allows addition without weakening the pillar with an additional mortise joint.

7.22

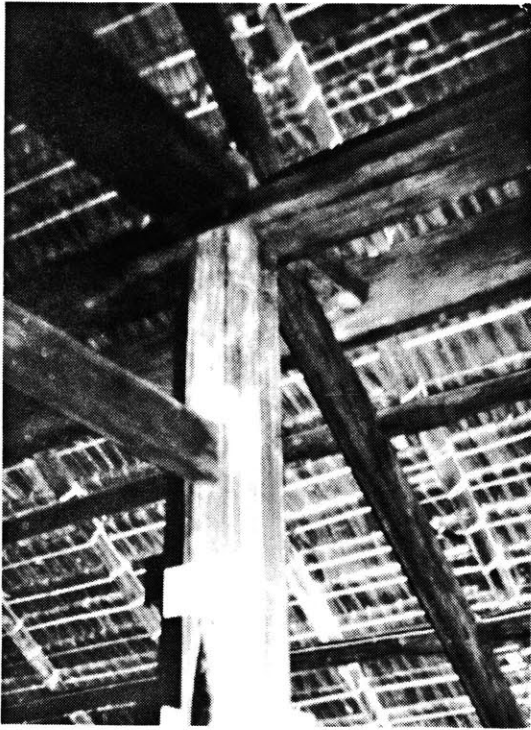


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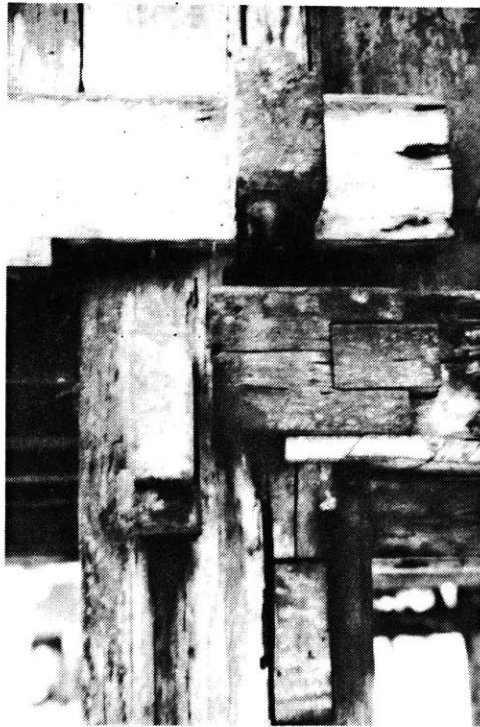


7.24

of timber, the roof has a structural integrity independent of the frame of the house. In some of the older houses (mid to late nineteenth century) it may be seen that the roof merely rests upon the house, held in place by its own weight, similar to the manner in which the house sits upon the plinths. In this structural sense, the Malay house bears a great similarity with the older houses of Sumatra. In newer construction, however, the roof is bolted to the house, eliminating the need for the cross-tie and therefore using less timber.



7.25

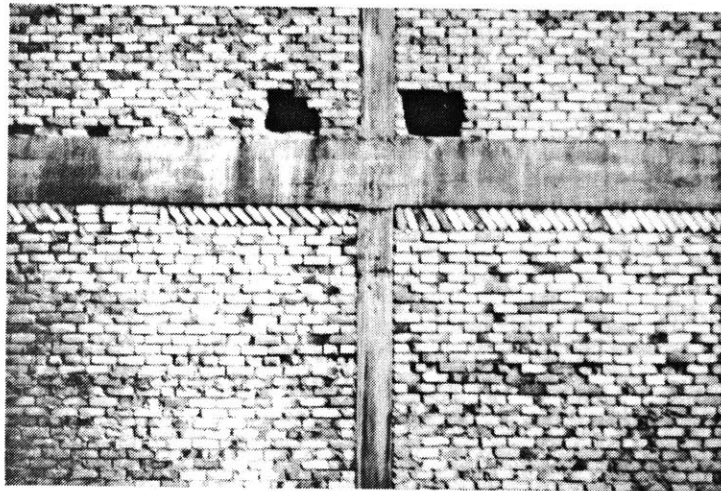


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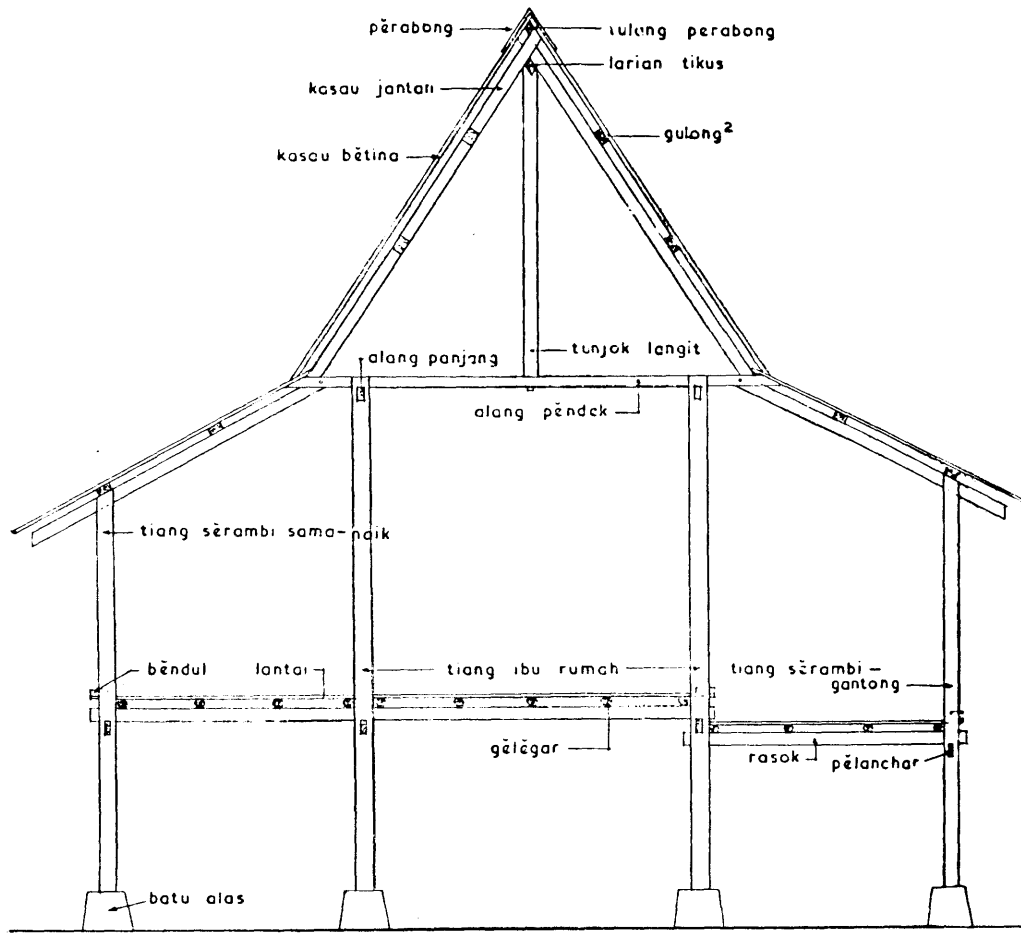
7.25. The tiang seri (the main column). 7.26. A mortise and tenon joint after many changes. 7.27, 7.28. The reinforced concrete frame with brick infill, the common construction technique for contemporary building.



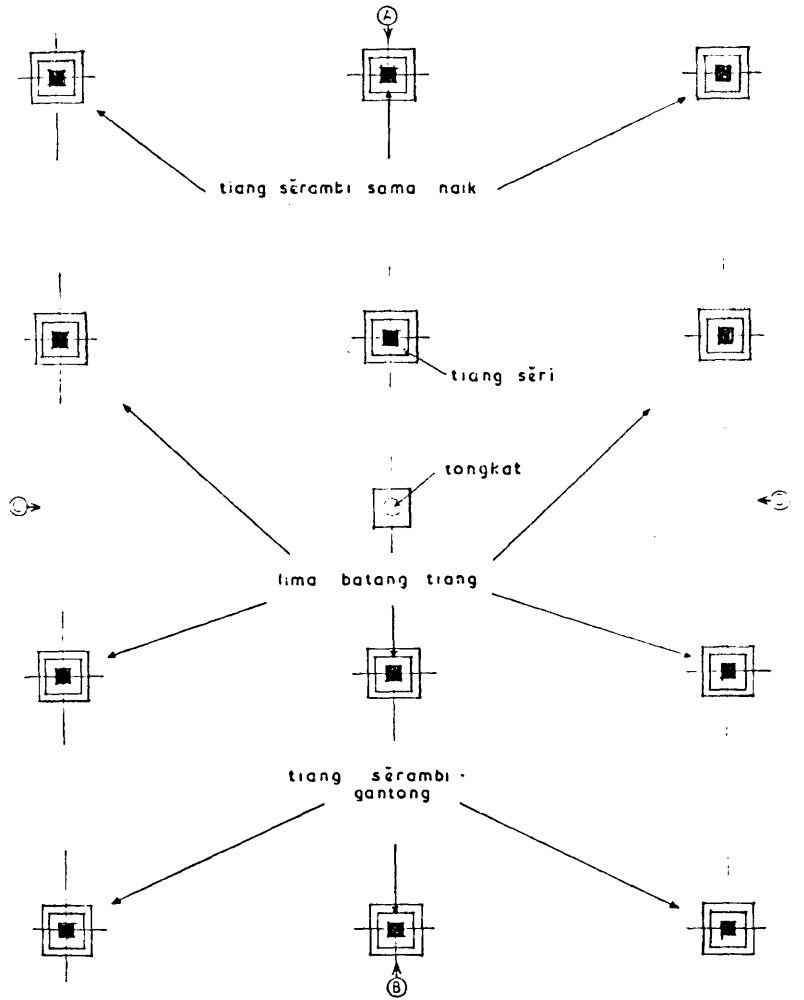
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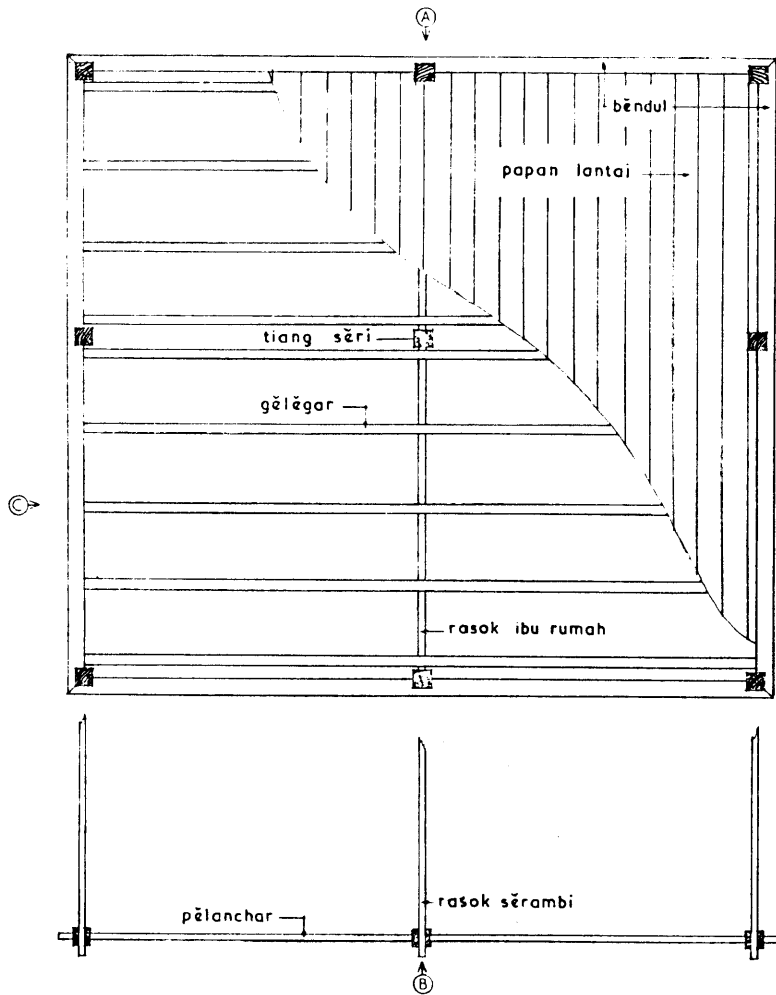
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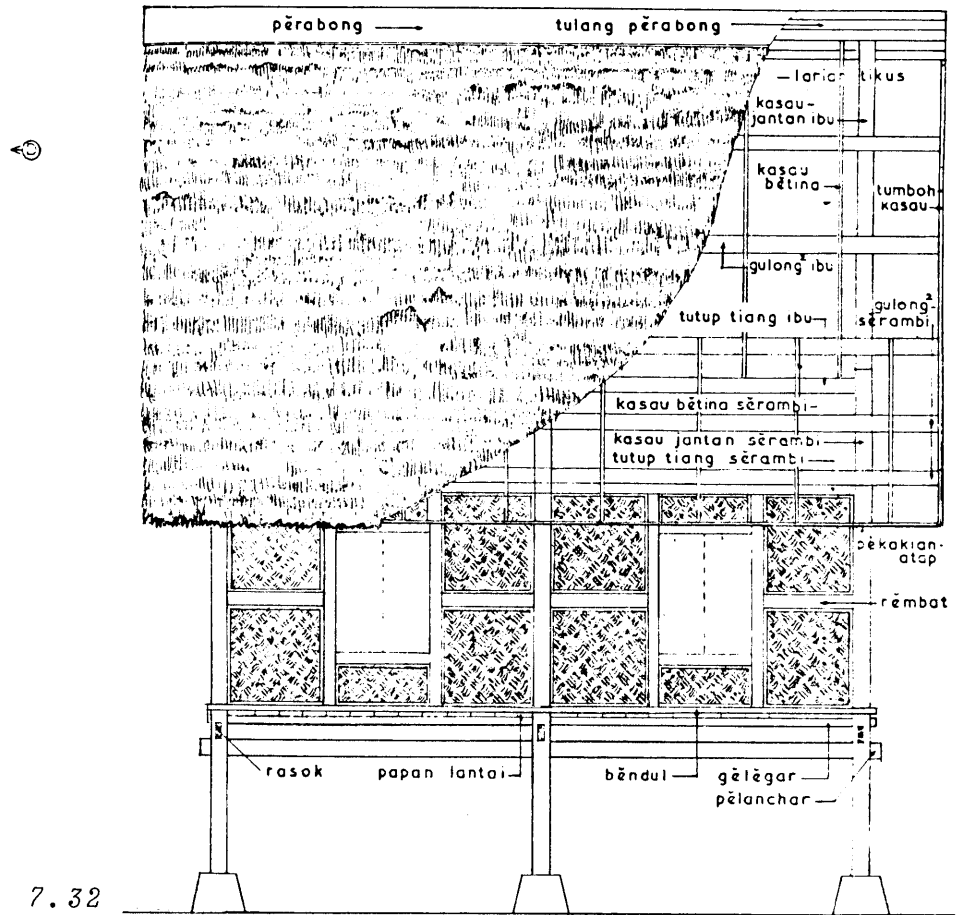
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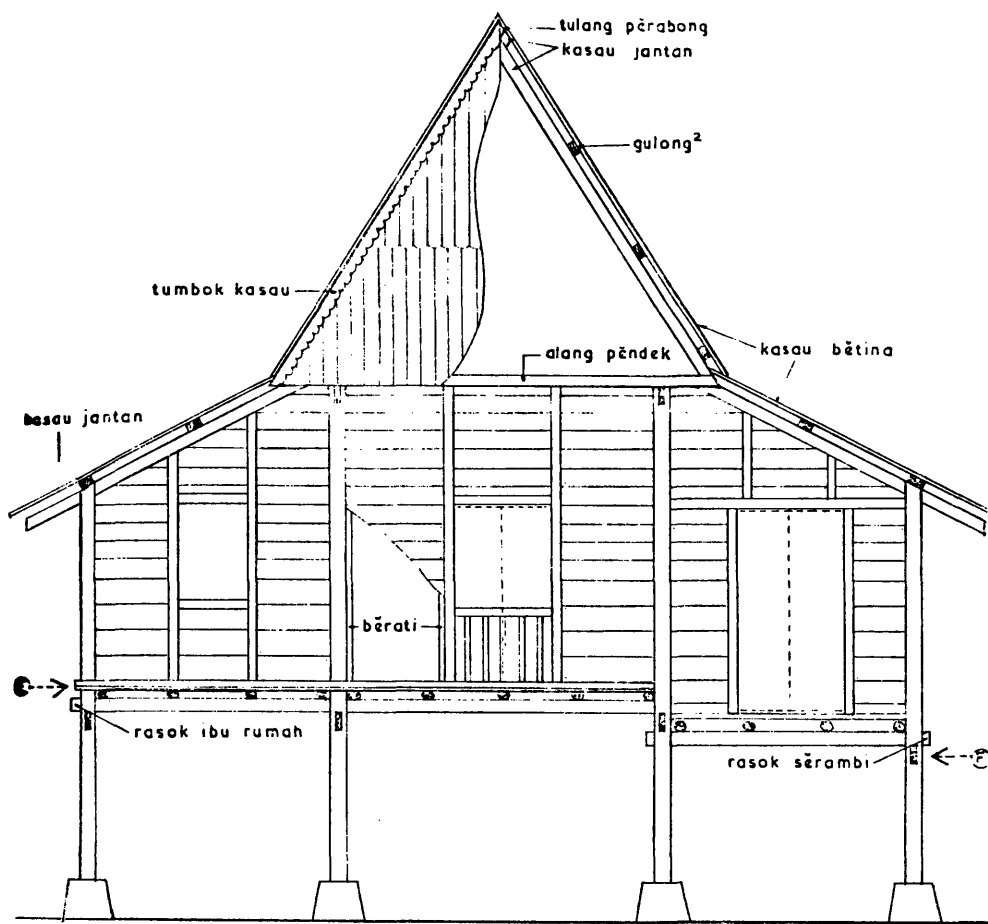
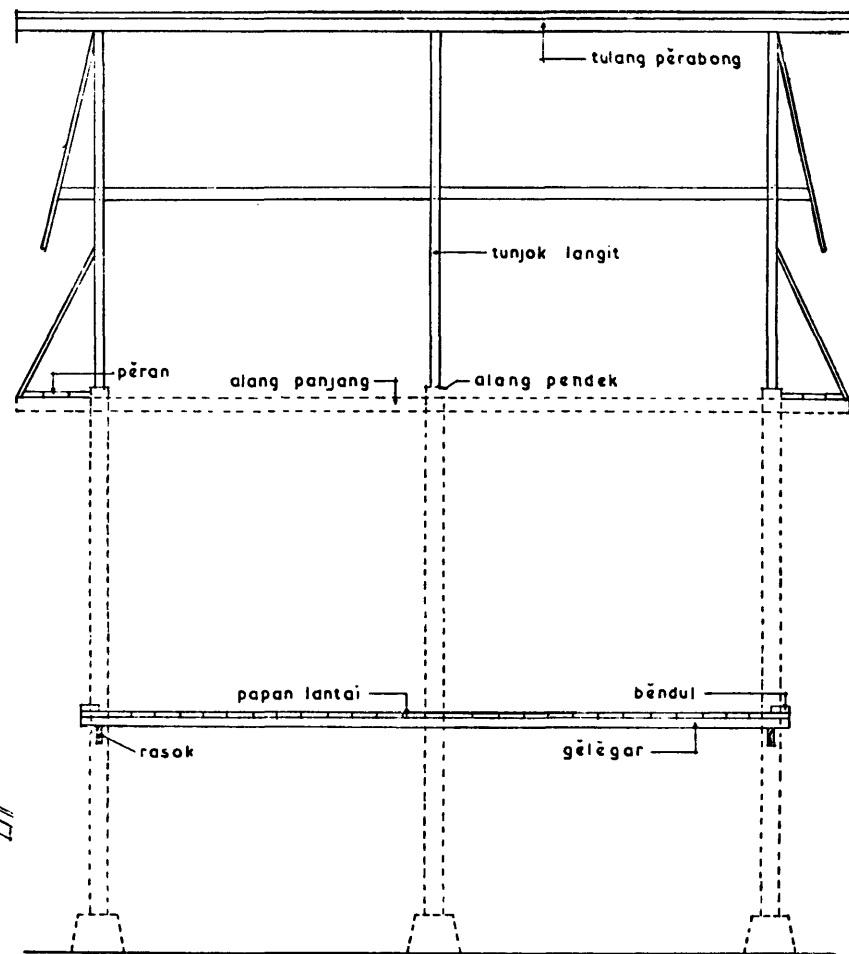


7.31



7.32

7.33



7.34

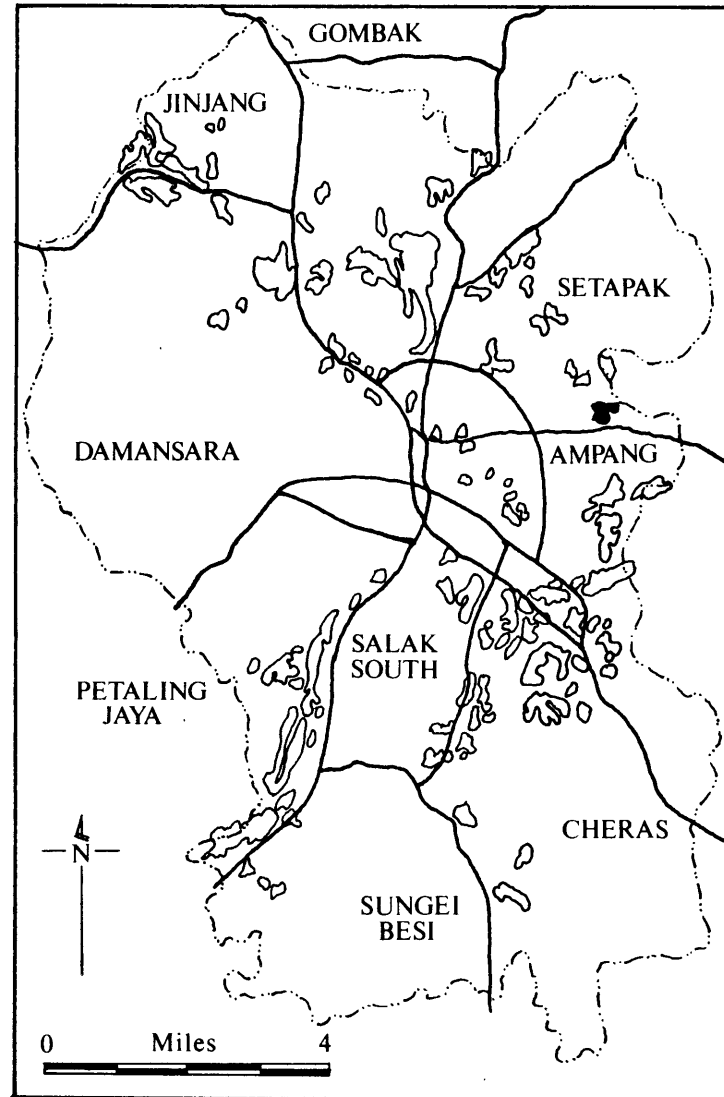
PART III: DESIGN



Chapter 8 : Site Analysis, Program and Design Criteria

For the purpose of illustrating that what I have observed as relevant to contemporary housing in Malaysia, I have applied traditional principles of designing and building to a hypothetical housing project in Kuala Lumpur. My intention is to create an environment which is consistent with Malay culture and which accommodates the services of the contemporary urban infrastructure. The lessons I have learned from the kampong are perhaps best applied to an "urban village" (as this term might describe a housing estate), incorporated into the larger tissue of the city.

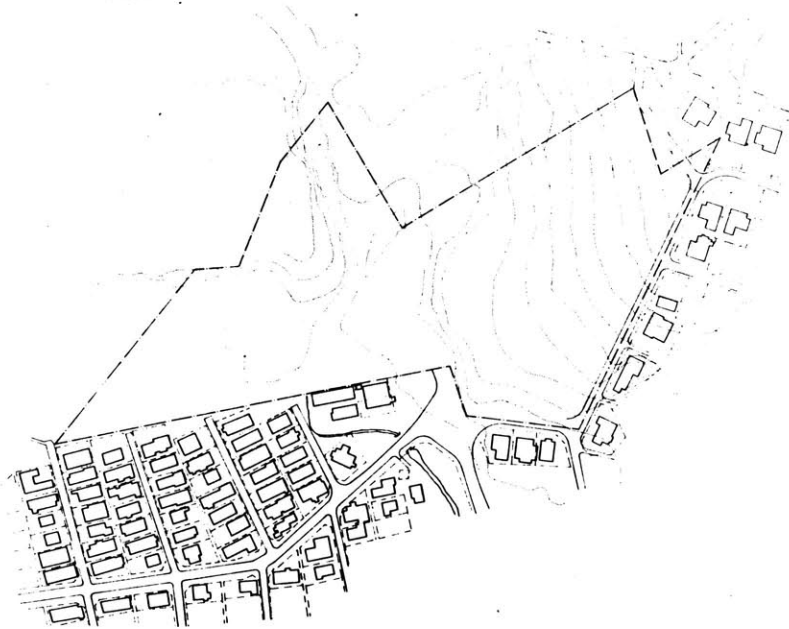
The site I have chosen is a seventeen acre site in the northeastern corner of Kuala Lumpur. Twelve acres of this land had previously been studied by government architects



8.0

8.0. Squatter settlement within the city limits of Kuala Lumpur. The location of the site is shown in black.

as a possible site for medium-rise housing. It is located close enough to the central business district of the city so as to be a viable place of residence for city workers. It is well-connected by roads and bus routes, and is surrounded on all sides by previously developed lands. The northwest edge is bordered by a military camp, and what few small shops there are in the area have sprung up along the main road to the north to serve the camp. To the east is an upper middle class neighborhood. The lots are spacious and the houses are of "modern" construction; concrete frames with masonry infill. Downhill, to the south, are houses much more closely related to the traditional buildings which I have been studying. They are built of wood and other low cost materials (corrugated metal, concrete block), are much more densely sited, and are reminiscent in form of rural Malay homes. The residents are of low to average income.



8.1



8.2

8.1. Site plan without existing squatter houses.
8.2. House located to the south of the site.



8.3



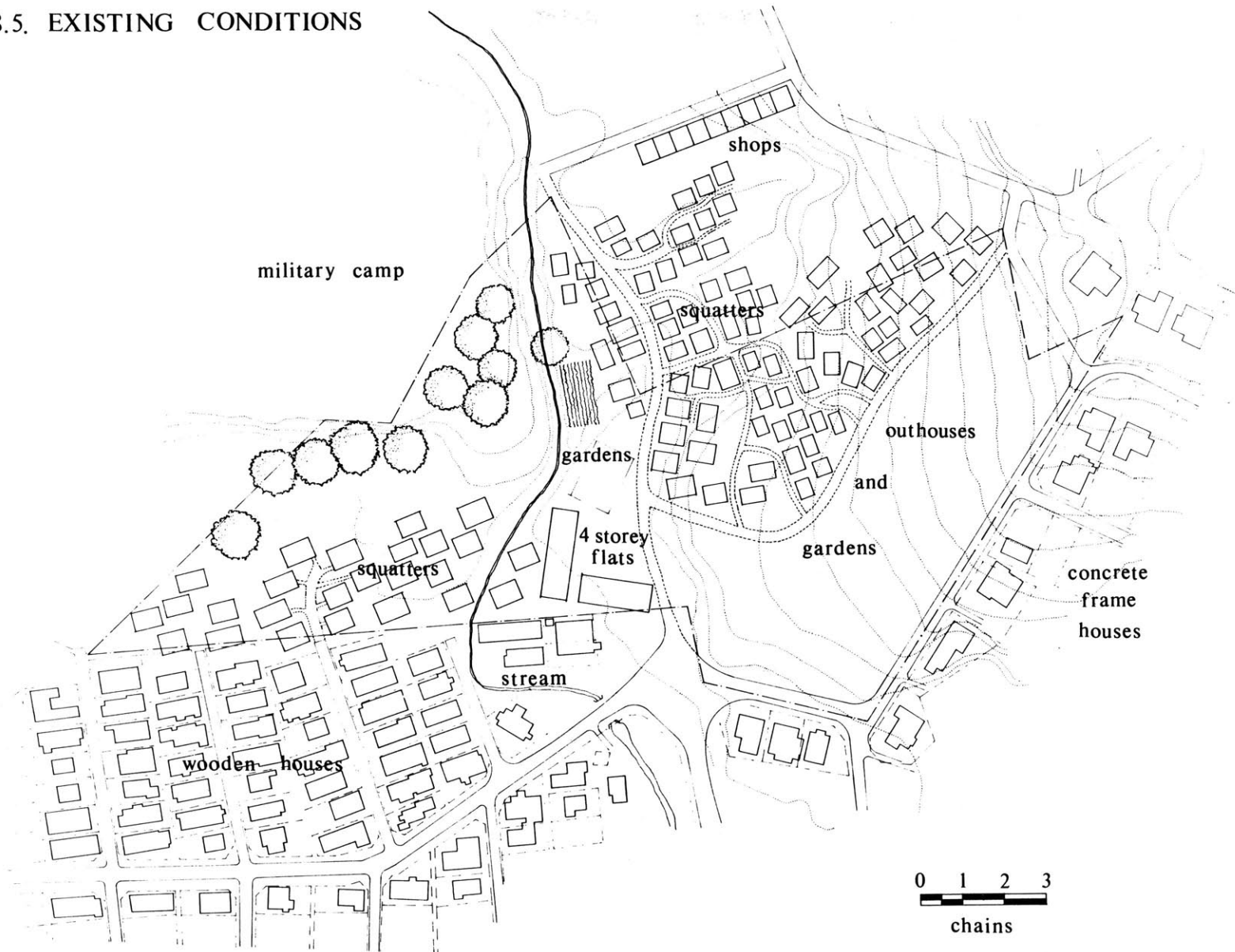
8.4

8.3. Minimal squatter hut.
8.4. Main road through settle-
ment.

The site, however, is hardly an empty lot. As approximately 40% of Kuala Lumpur's total population of 800,000 are squatters, it is rare to find a sizable tract of land in the city that is uninhabited. The squatters on the site are a community known as Kampong Kinabalu Hujung, and are, for the most part, rural Malays who have come to the city looking for employment. The tenure of many of the residents dates back as far as 1969. The residents are of low income, as most who are employed are unskilled, or semi-skilled workers, such as food hawkers, gardeners, drivers, low-level clerks and security guards.

The terrain is quite hilly with downhill slopes from the east and the west, meeting at a stream which flows through the center of the site. The main circulation system for the squatters is a

8.5. EXISTING CONDITIONS



8.6



road which runs down the hill from the east and turns north before it reaches the stream. Most of the houses are to the north of this road, with outhouses and small gardens spread throughout the overgrown section to the south. There are a couple of small stores selling general goods located along the road as it turns north. Along the creek are some larger plots of land used for vegetable gardening.

8.7



The squatter houses in the western part of the site are relatively unconnected to the kampong, as they are extensions of a series of parallel lanes leading to the main road to the south. The lanes themselves do not extend as far back as the houses, but rather connect to a web of interconnected footpaths. Behind these houses is a grove of very tall angšana trees which creates a large shady space, very popular among the children of the area. It is a well-

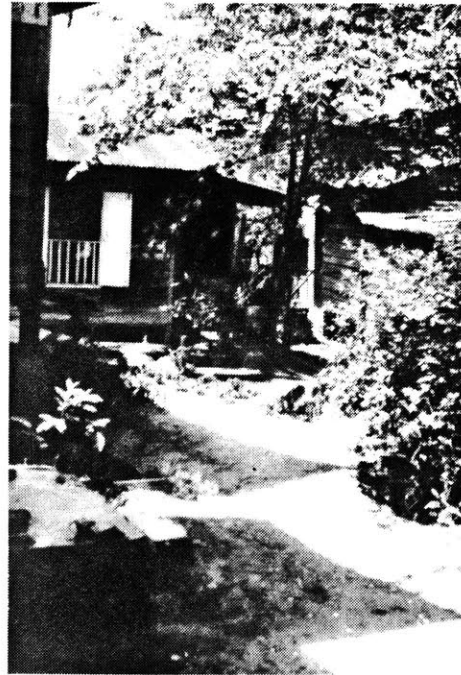


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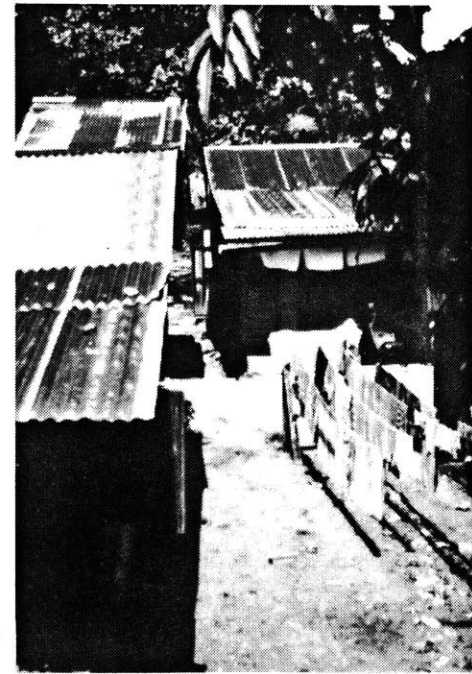


8.9

protected place, as it is away from the street and close to the houses. Running along the north side of this "playground" is a steep slope, forming a natural topographic boundary between the site and the military camp.



8.10



8.11

8.8, 8.9, 8.10, 8.11. "Courtyards", shared spaces between houses.

PROGRAM SCENARIO:

The hypothetical client is a housing cooperative made up of local residents, including the people who are presently squatting illegally on the site. The land belongs to the government, which has agreed to make it available to the coop at below market value on the condition that the coop present a viable program to develop the site. Within the cooperative, priority will be given to those people displaced by the new development. The residents are ethnically Malay, and most have come from different parts of the country to work in Kuala Lumpur. Many have a stated preference for a one-story building with easy access to the outdoors, and a small plot of land on which to plant a garden. Hence they are adverse to living in the medium and high-rise flats provided by the government. As most of the money-earners in the cooperative

are low-paid workers in the service sector of the economy, they would prefer to live as close to the downtown area as possible. One reason why many of the squatters settled here in the first place is because they can easily walk, bicycle or ride a bus to work from this location. Most of the new government housing is located outside the city in the suburbs.

In the years that the squatters have occupied the land, a feeling of community has developed between them. Although the original settlers came from many different kampongs spread throughout Malaysia, they all shared the experience of being rural people thrust into an unfamiliar urban environment. In a way, they formed a support group for each other, watching out for the welfare of all the residents of their new kampong. This community spirit was broadened as relatives

from the rural kampongs came to join their families in the city. As in a rural kampong, the idea of "gotong royong" is still very much alive. The cooperative intends to save money by doing as much of the construction as possible without outside builders, instead relying on mutual cooperation to construct houses. A few of the residents have had construction experience and wish to organize and instruct the others in the craft of building. Another hope is that costs may be lowered by re-using materials from the existing houses on the site.

Certain basic amenities should be provided; every unit should have piped water, a flush toilet, and refuse collection. Despite the fact that few of the residents now own cars, automobile access to units should be a consideration, as it is possible that car-ownership will increase in the next few years.



8.12



8.13

8.12. Newly-constructed four-story flats on site. 8.13. Drainage ditch through site.



8.74

A suitable number of parking spaces is necessary. Communal parking lots which could double as hard-surface play areas for children is one recommendation.

Within the housing development there should be some commercial enterprises at a scale small enough to primarily serve the immediate residents, but large enough to attract people from the surrounding area. The idea is to be somewhat self-supporting as a community without becoming socially or economically isolated from the city. These commercial activi-

ties should include small shops of various sorts, perhaps an outdoor market to sell food, and light industry, at the level of artisanry or cottage industry.

Certain institutional buildings are also necessary as part of the development. The mosque should have a prominent position within the community, as it traditionally has in rural kampongs. A small health clinic offering emergency aid and various educational programs should be built, and a kindergarten or child care center is desirable. It has been suggested that a technical school be set up in conjunction with the light industries, to offer a specialized form of adult education. Although a large meeting hall is not necessary, a suitable open space should be maintained for large gatherings. This space can function on a daily basis as playing fields for the children of the area.

DESIGN CRITERIA:

There are certain ideas which emerge at the early stages of any design project. In the case of the Bukit Keramat housing development, these issues are related in part to our study of Malay vernacular design, for it is my intention to design an environment which is conducive to the continuation of traditional culture. Although informed by this context, these basic criteria are, however, specific to the program and the site.

The houses are to be constructed by the residents to whatever extent they are able to. This will lower costs, harness the community spirit of "gotong royong", prevent the monotony of mass-produced homes and allow for changes and improvement over time. For the sake of providing the proper infrastructure (plumbing, sewerage, site layout) it would

be easier for initial construction to be done by outside contractors, utilizing the form of a core house. Onto such a core a variety of spaces may be added forming one, two, three, or four bedroom units. It is assumed that construction will follow the rules of the local vernacular, as that is what is available to the residents in terms of materials and technology.

The layout of the houses should provide for a small plot of land adjacent to each unit, to be used as a garden or perhaps in the extreme case to be built upon. All units should have access (direct or indirect) to larger communal spaces (a "courtyard" in Western terms). These spaces are to be linked by a circulation system which emphasizes pedestrian traffic without excluding automobiles altogether. The aim is for informality of spaces, laid out in such a way as to promote social contacts.

8.15, 8.16. Marketplaces in the Malaysian city.



8.15



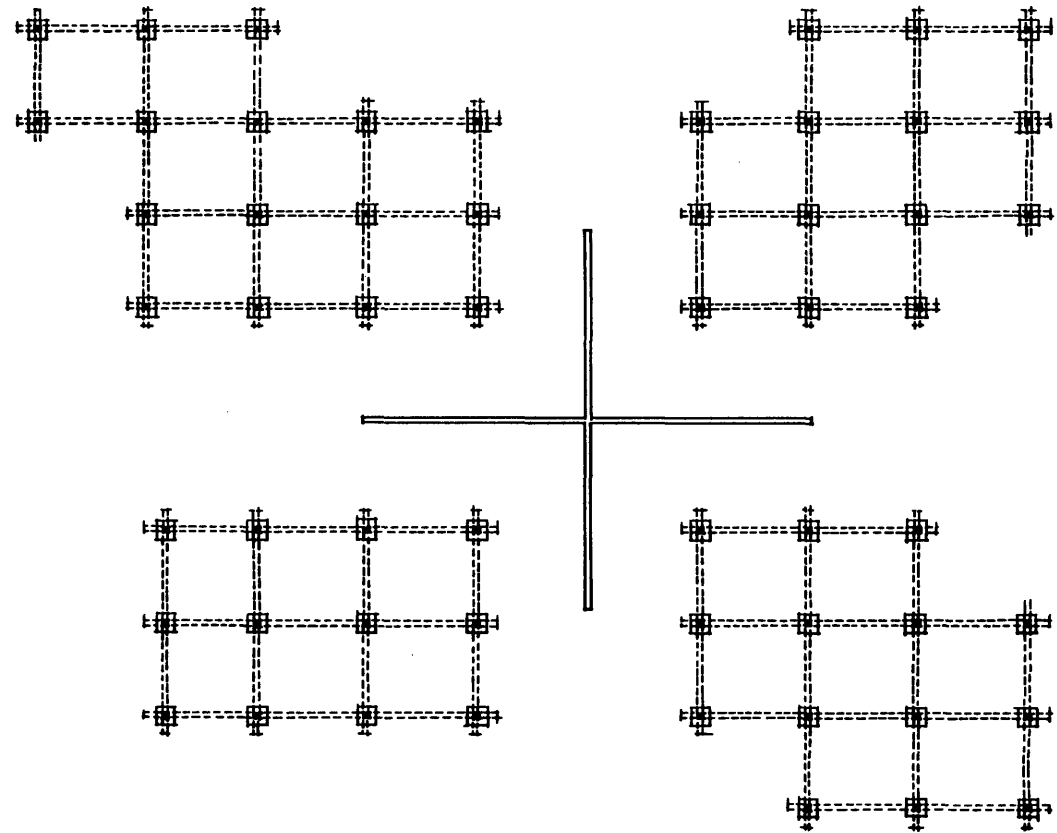
8.16

There should be an aspect of internalization to the residential portions of the development and yet a strong connection between the commercial section and the surrounding region. This defines areas of very different character within the development. Perhaps the idea of a hierarchy of connections may be applied to the circulation system so as to accommodate these differences. As the commercial area would be effectively the "village center", links between it and the residential areas are very important. A large outdoor communal space (in the form of a park or an open market) should be included in the "village center" as an extension of the informal "courtyards" of the residential areas.

Chapter 9: Structural Framework and Unit Organization

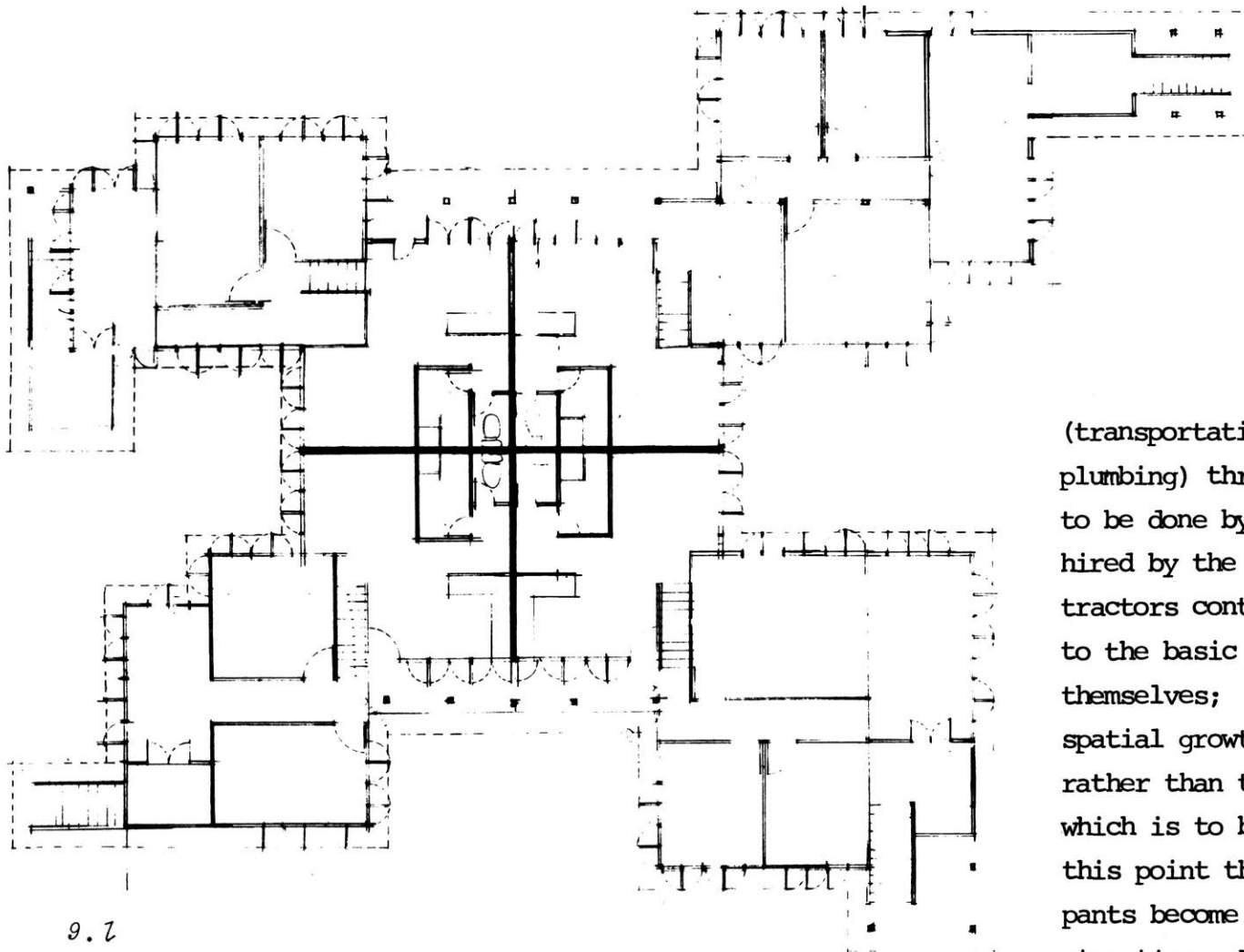
A concrete core is created by the clustering of four units. This core is the distribution point for services (water and sewerage) and a safe (non-flammable, well ventilated) place for a cooking fire. It is anticipated that the traditional activities of the kitchen, such as cooking, eating and cleaning will occur within this core. At the center of the core, although separated from the kitchen are the toilet and the bathing rooms. It is important that in addition to being privately enclosed these rooms are vented directly to the outdoors. As in traditional houses, the roof planes are staggered to introduce fresh air and diffuse light to the interior of the structure.

The construction of these cores, as well as the laying-out of services



9.0

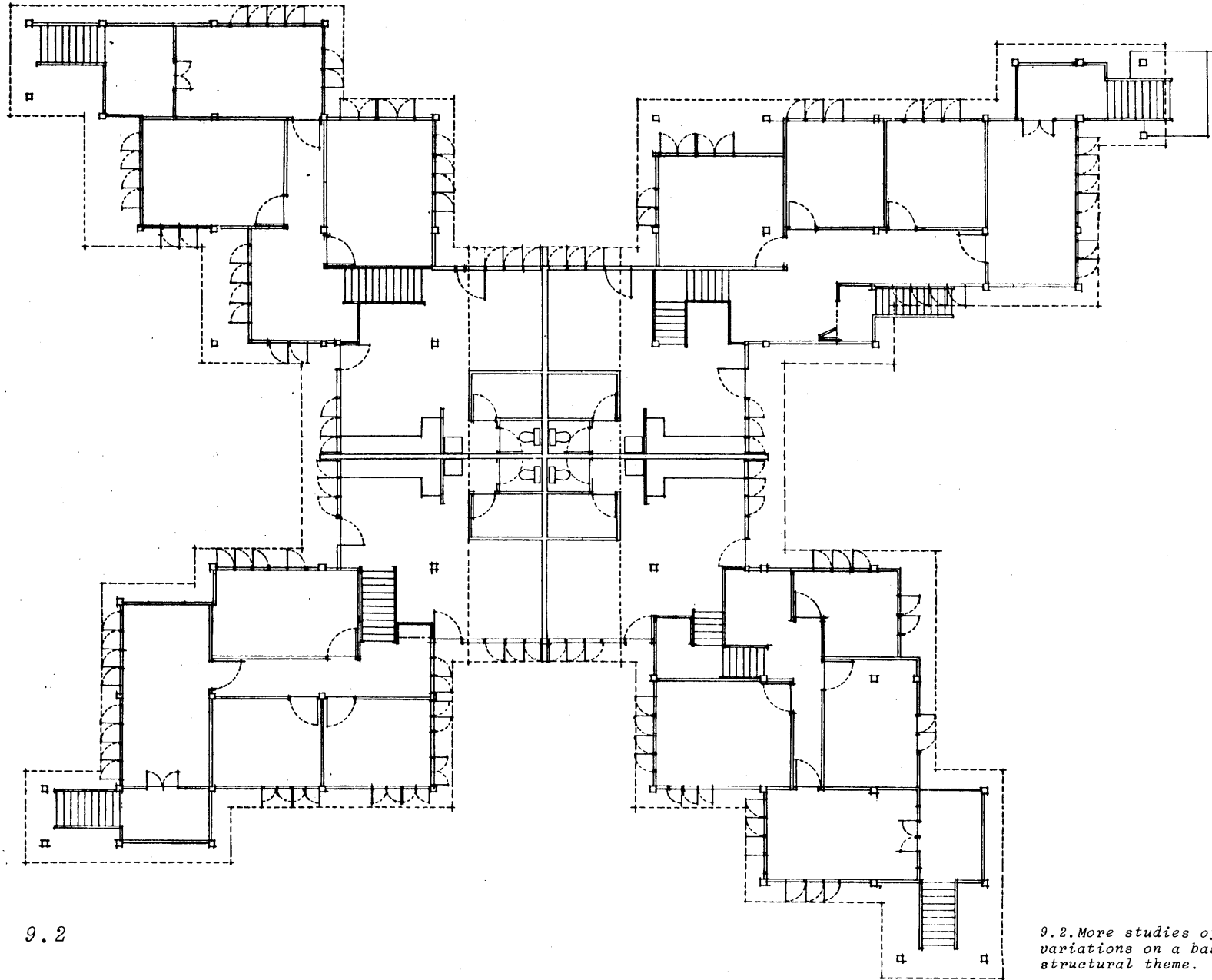
9.0. Plan of utility core and structural framework of a 4-unit cluster.



9.1

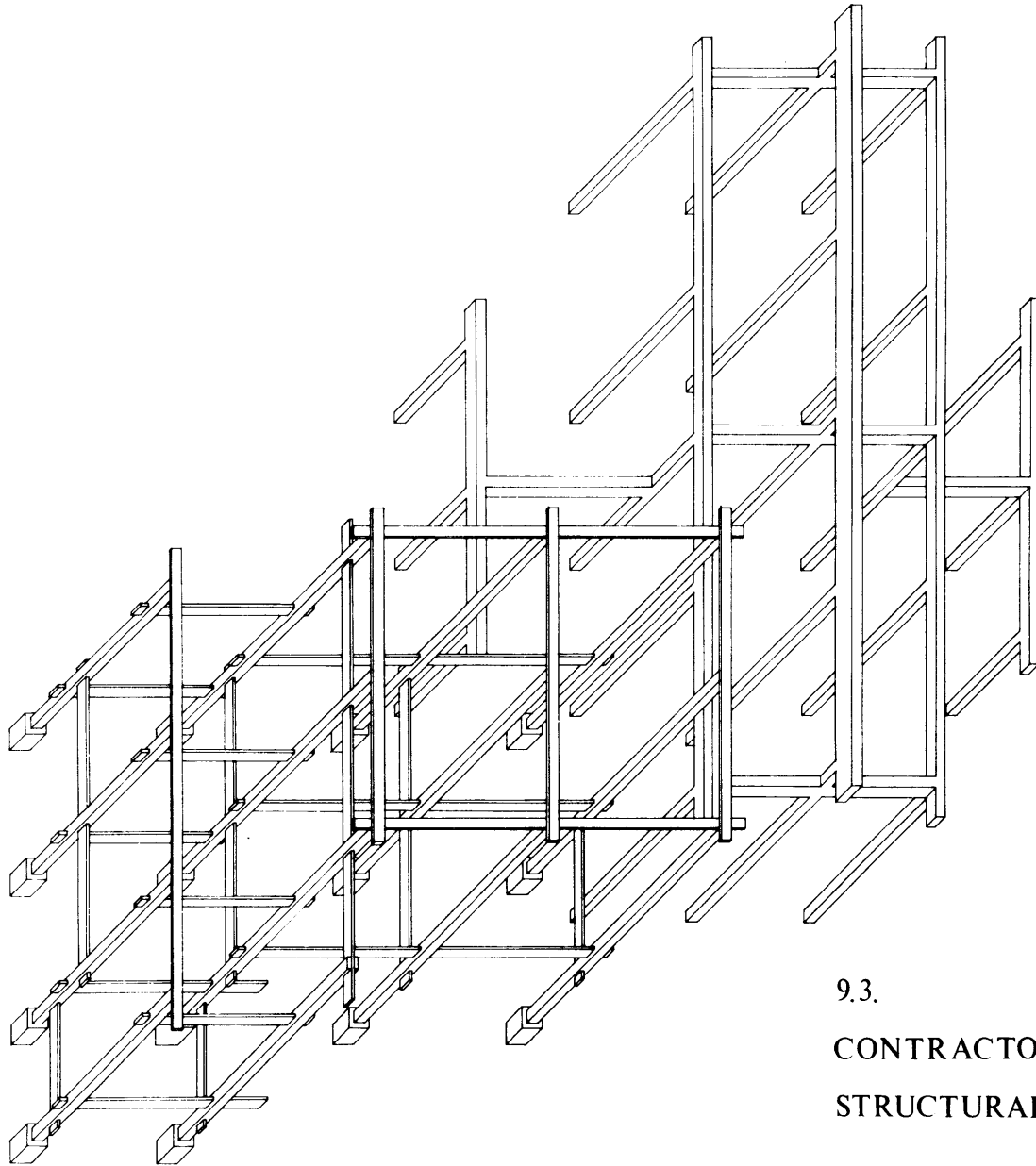
9.1. Early study of layout variations with secondary infill and enclosures.

(transportation, electrical and plumbing) throughout the site is to be done by outside contractors hired by the cooperative. The contractors contribution also extends to the basic structure of the units themselves; this is to encourage spatial growth and built additions, rather than to delineate that which is to be built. It is at this point that the eventual occupants become involved with the construction. By working with the contractor, they will have a voice in the decisionmaking, and will learn construction techniques which will be useful later on.



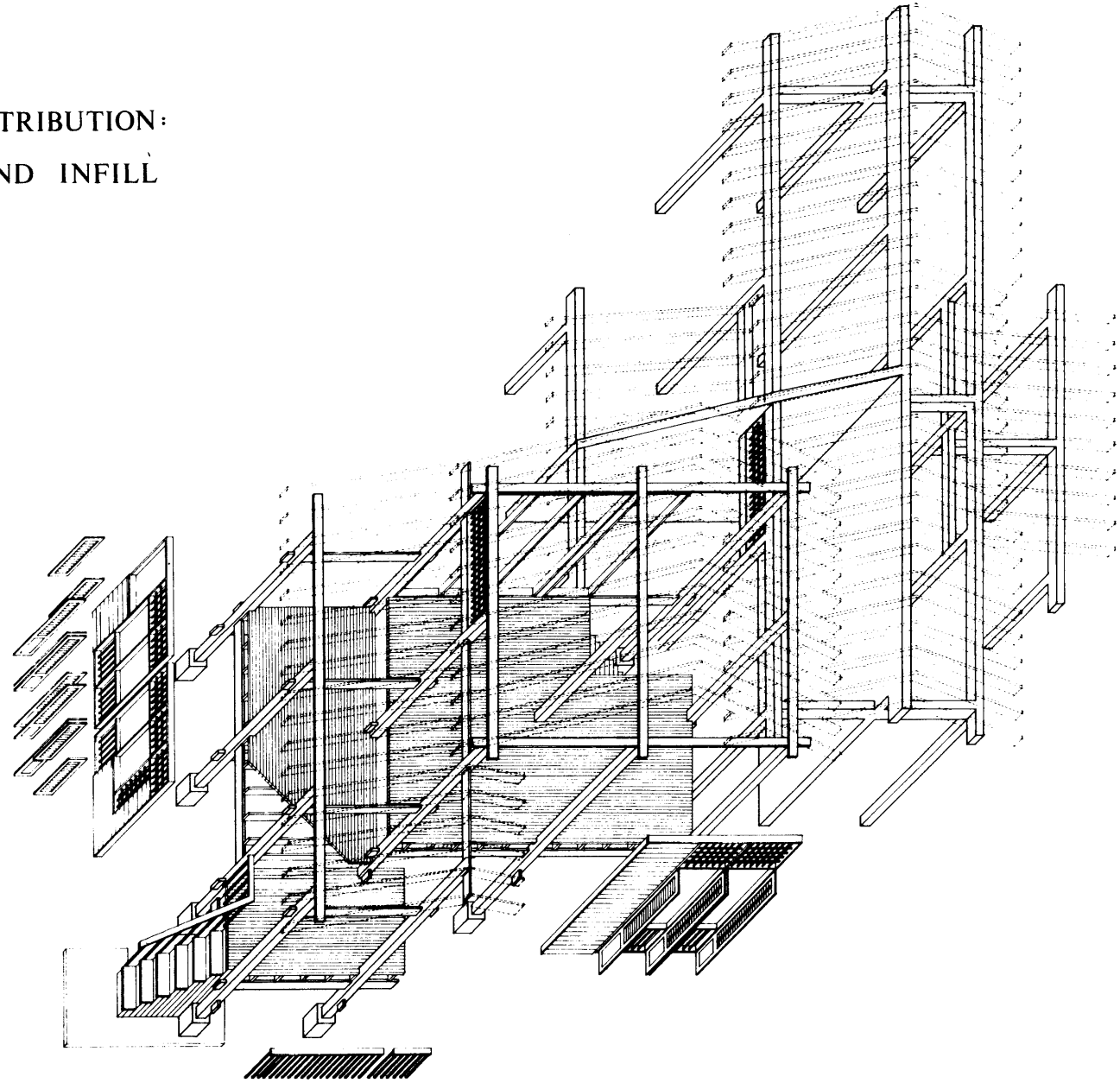
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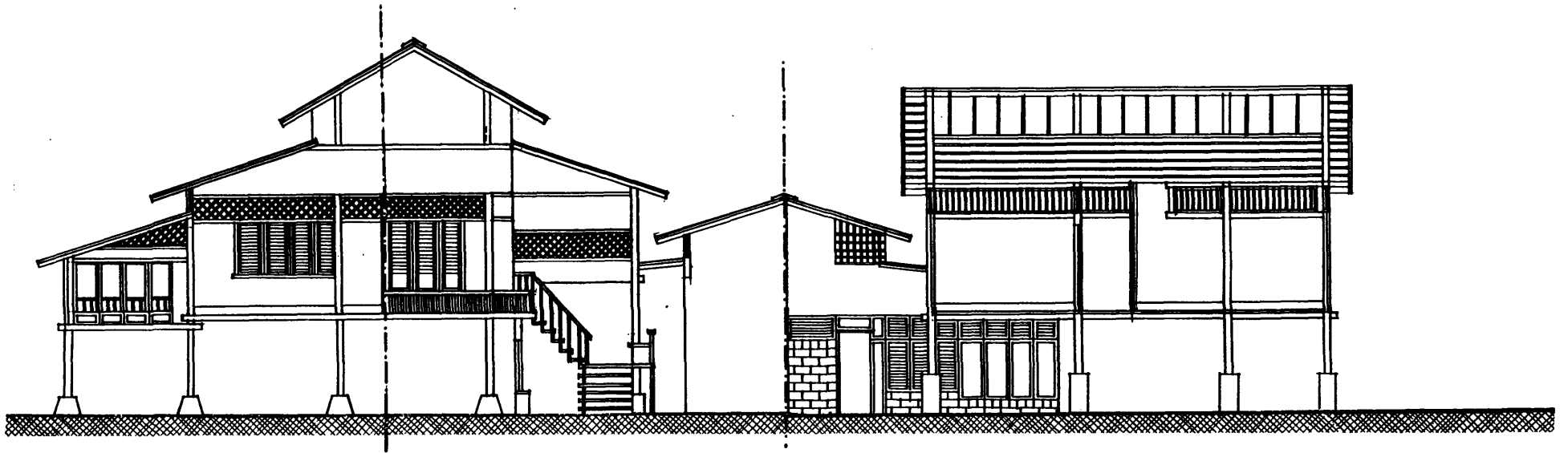
9.2. More studies of layout variations on a basic structural theme.



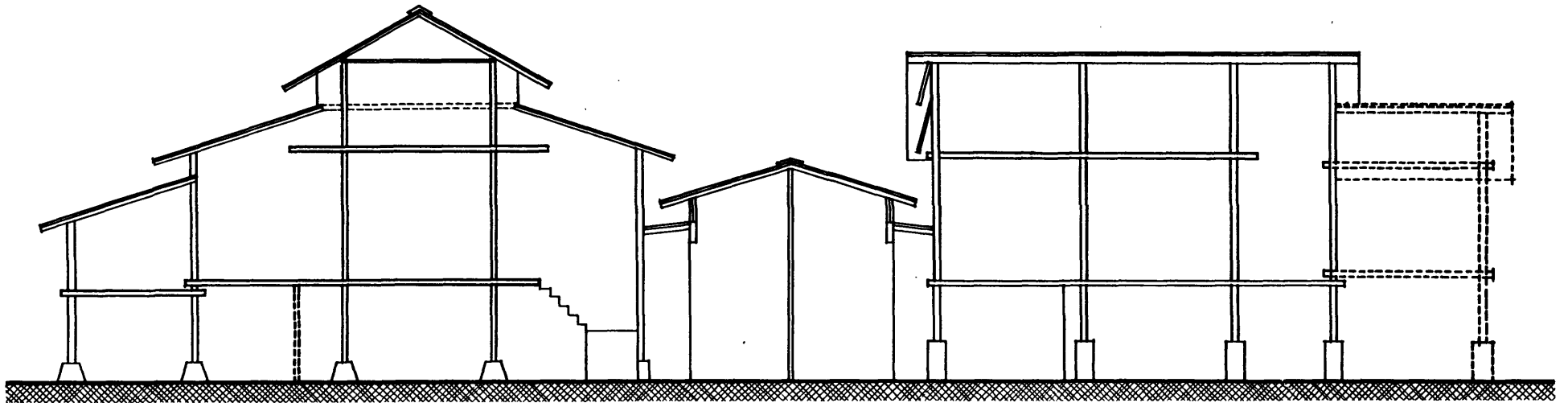
9.3.
CONTRACTOR'S CONTRIBUTION:
STRUCTURAL FRAMEWORK

9.4.
USER'S CONTRIBUTION:
GROWTH AND INFILL





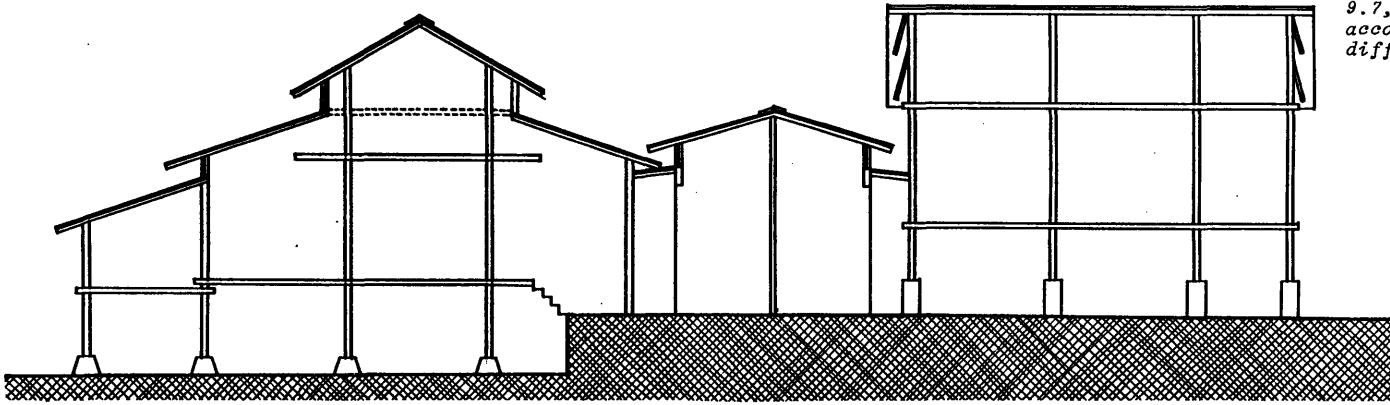
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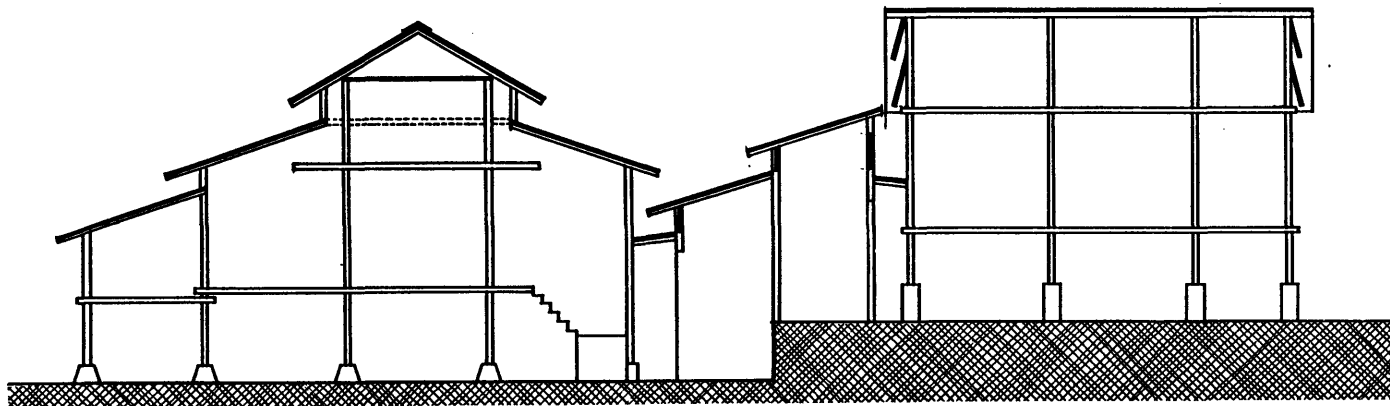
9.6

9.5, 9.6. Sections through a typical 4-unit cluster, as initially built and with future additions.

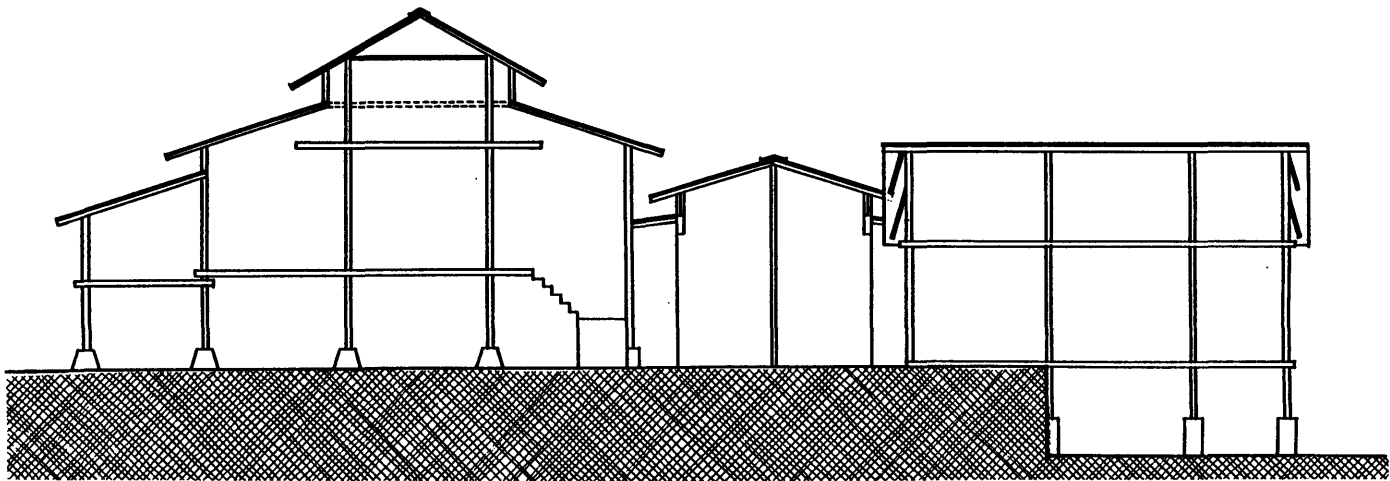
9.7, 9.8. Sections showing accommodation to topographic differences in the site.



9.7



9.8

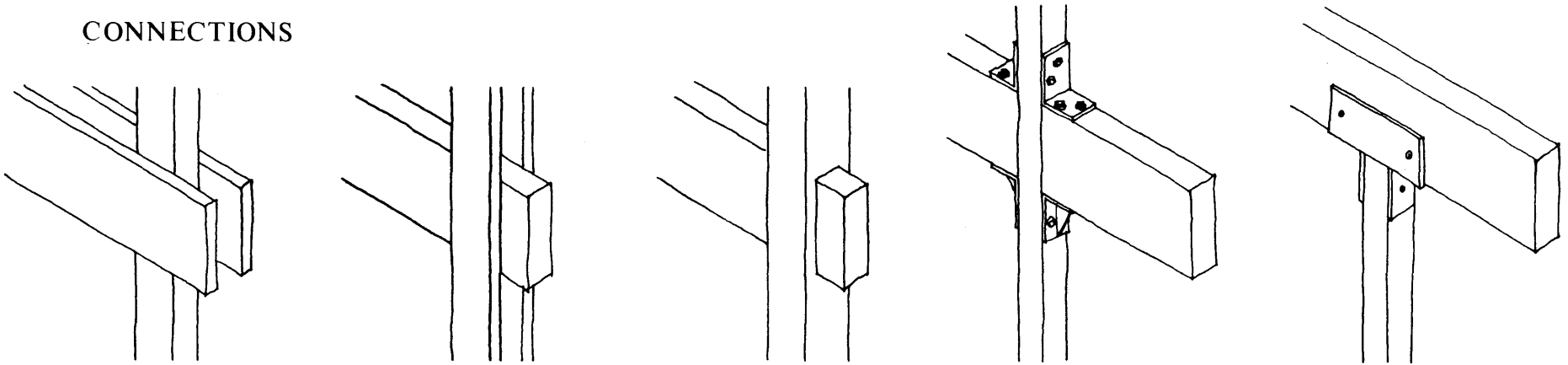


After the structure is in place, it is the responsibility of the occupants (perhaps in conjunction with their neighbors) to complete the building. Since much of the designing and construction of individual units will be done by the residents, what I have developed here is only an exploration of the possible outcome of a project such as this, and is not intended to be part of the architect's or contractor's role. If anything, these are only suggestions of variations, rather than specifications.

It is assumed that with a flexible structure such as is provided, the eventual spatial arrangements will be based upon the users' life patterns and principles in much the same way that traditional houses are. The initial determinant of a unit layout is family size and because of this, typical units may be of a variety of sizes (one, two, three or four bedrooms).

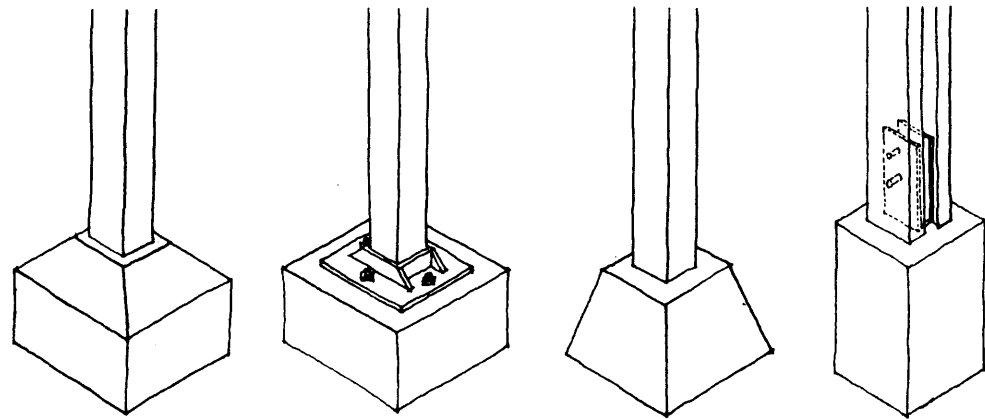
The construction of the houses is economically linked to the light industry in the area, for the cooperative will set up workshops to produce building parts, employing locally available materials and technology. It is intended that these workshops continue to produce after the initial construction is completed for they can sell outside the immediate region, bringing in revenue to the cooperative. They will also provide parts to the development for future growth or change. The workshops should produce a variety of products from the simple to the ornate, so that houses may be upgraded as the inhabitants' become more affluent. Because of the "low technologies" employed it will not be difficult to alter designs so as to suit more or less individual tastes or desires. This flexibility also means that the industry will be adaptable to market conditions when it begins to sell outside the local area.

CONNECTIONS



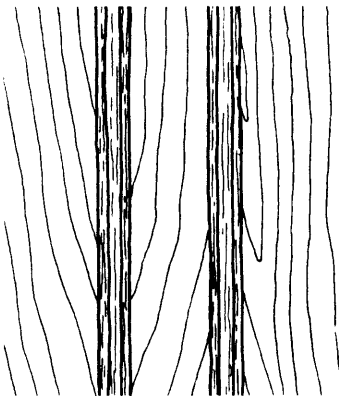
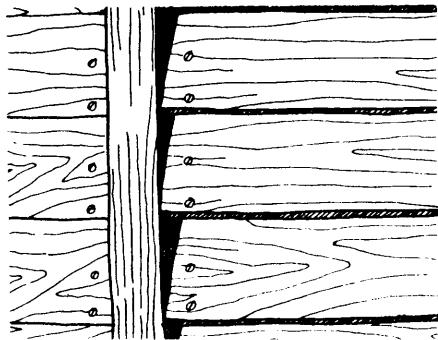
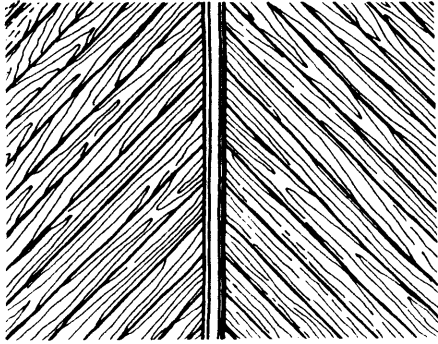
9.9

To what degree these details become standardized in their dimensions should be determined by the producers and the users (i.e., the cooperative). It is suggested, however, that traditional details be examined, to determine usable dimensions. In a system such as this, the architect should not put limitations on the range of details available.

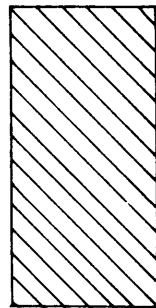
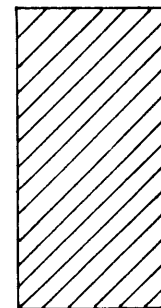
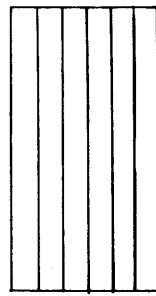
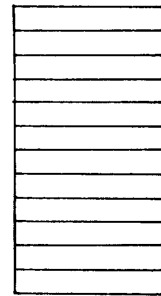
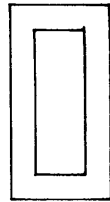
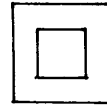
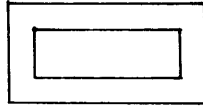


9.10

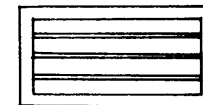
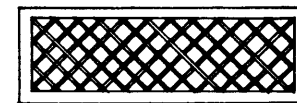
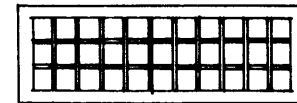
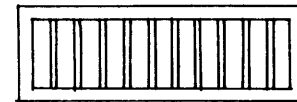
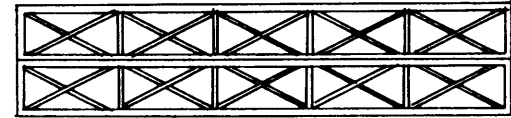
WALLS



Solid Panels



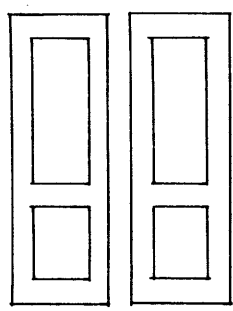
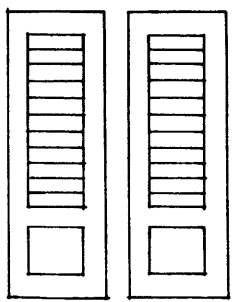
Screens



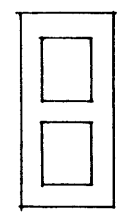
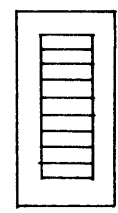
Fanlights



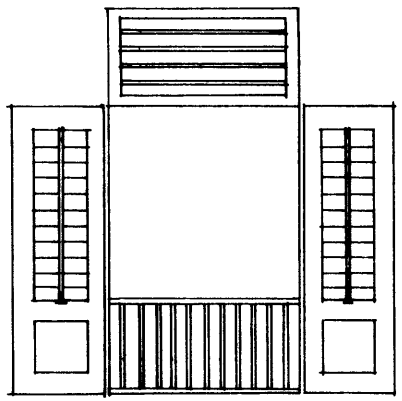
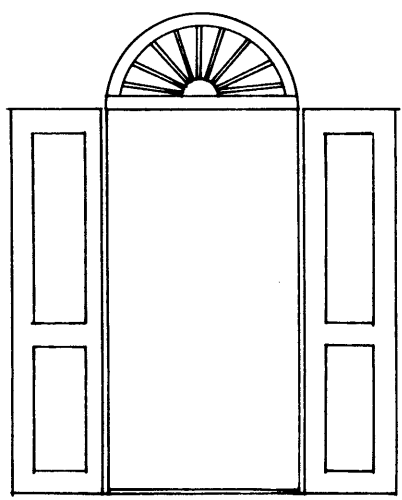
Shutters



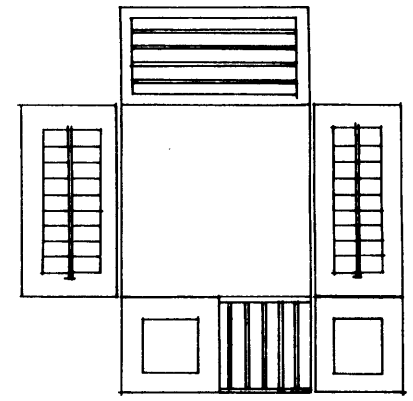
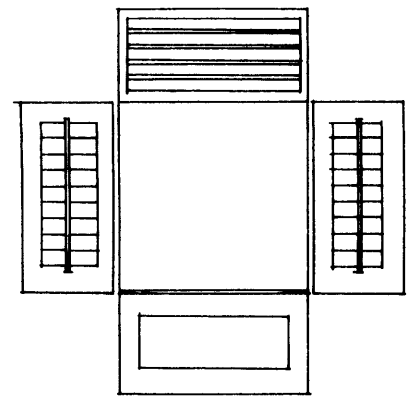
OPENINGS



Door

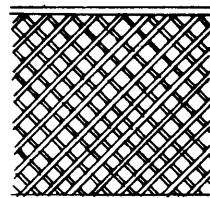
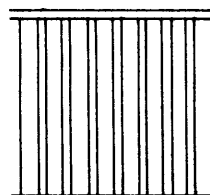
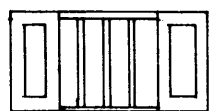
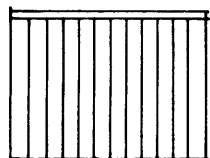
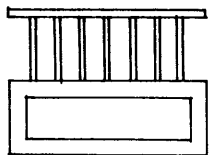
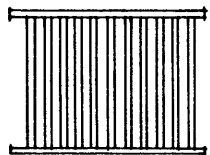


Windows



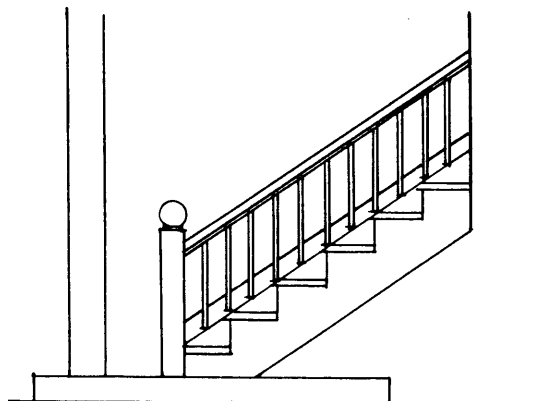
9. 72

RAILINGS AND BALUSTRADES



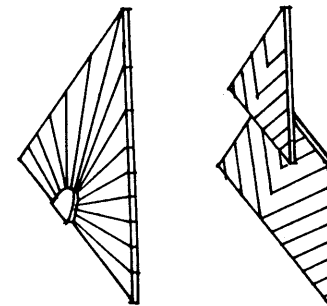
9.73

STAIRS

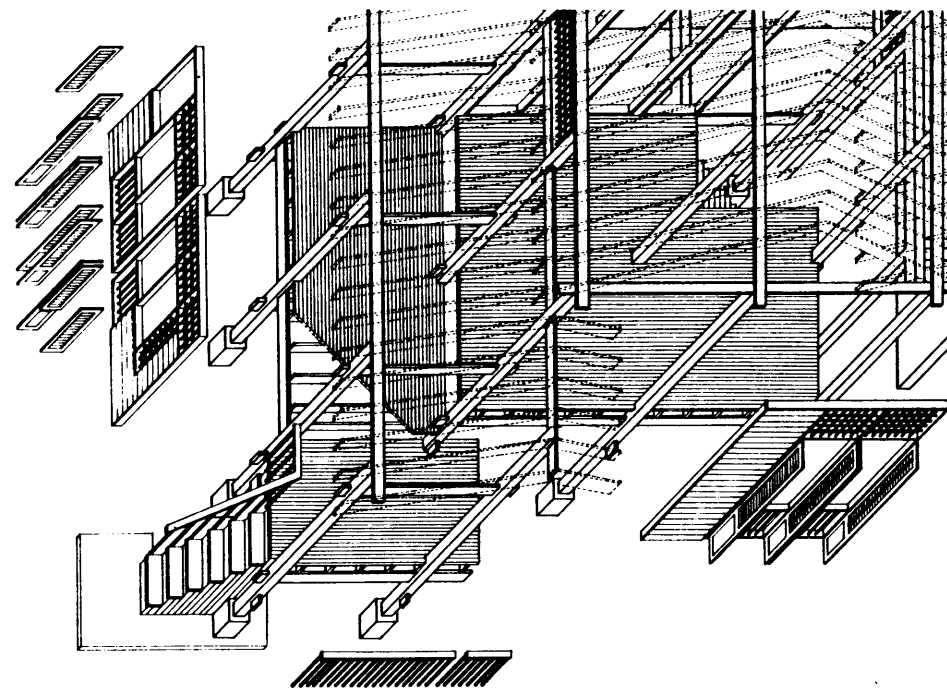


9.74

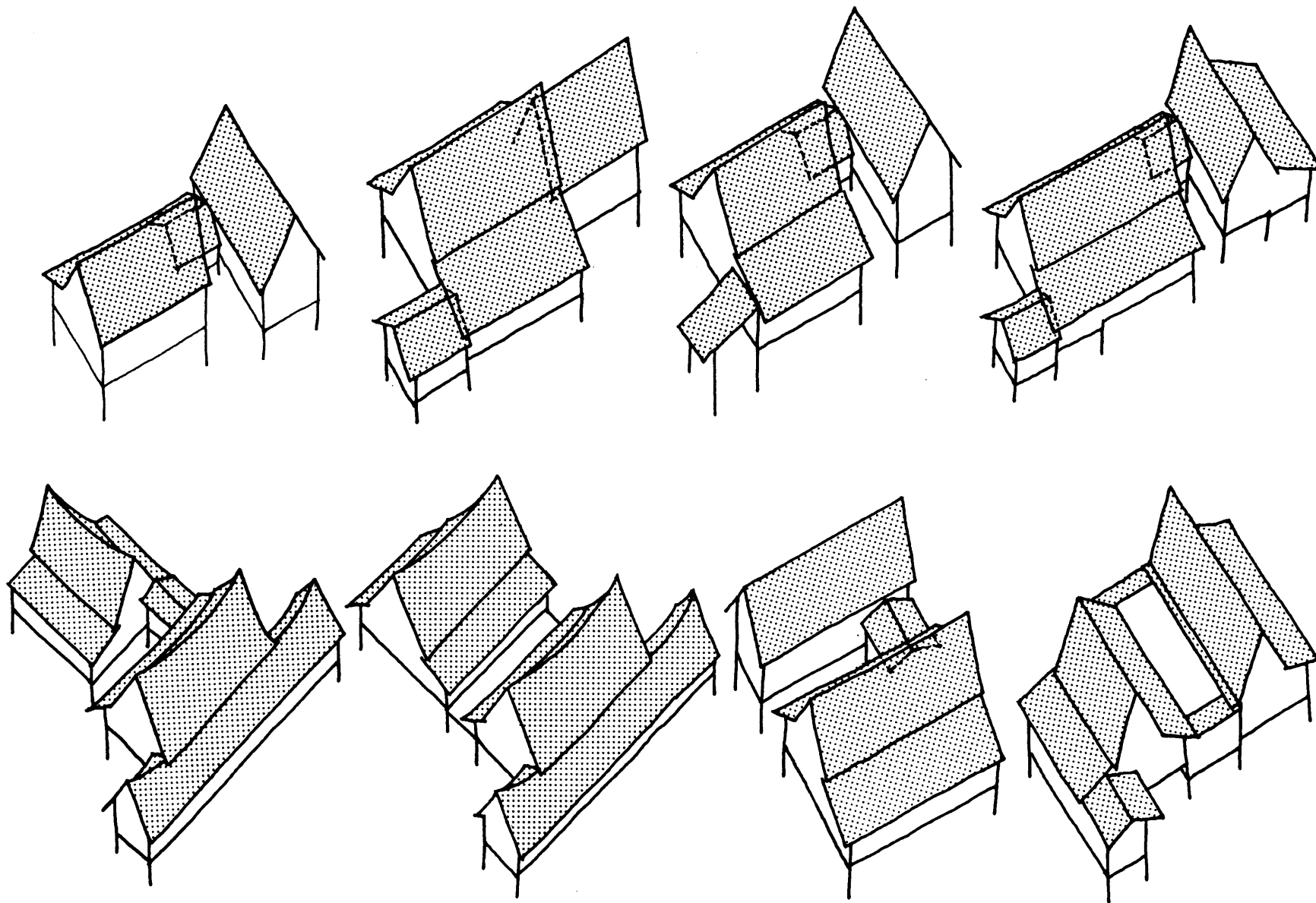
GABLE ENDS



9.75



ROOF FORMS



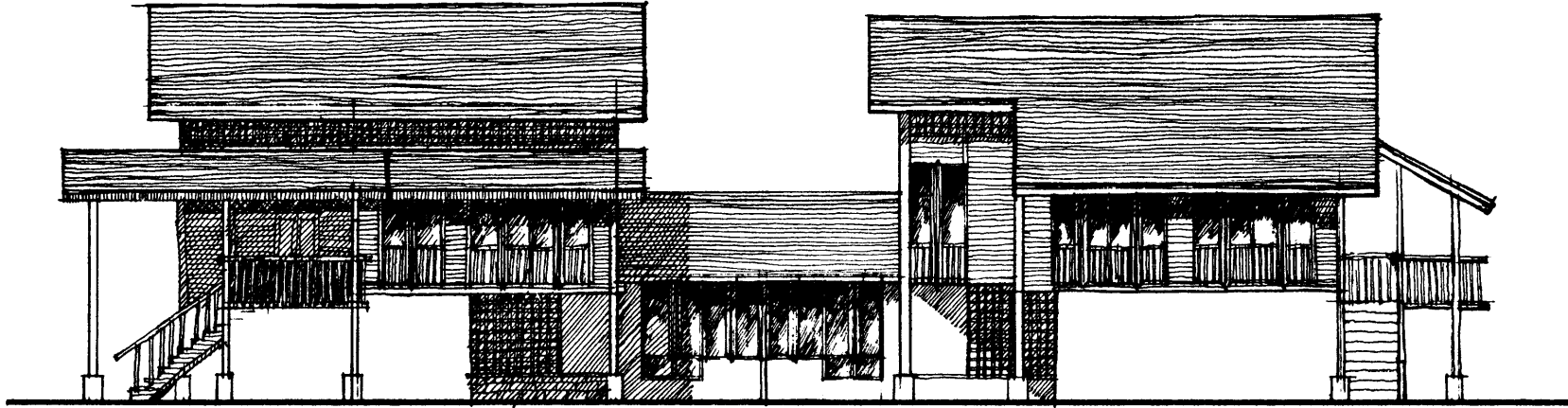


9.17



9.18

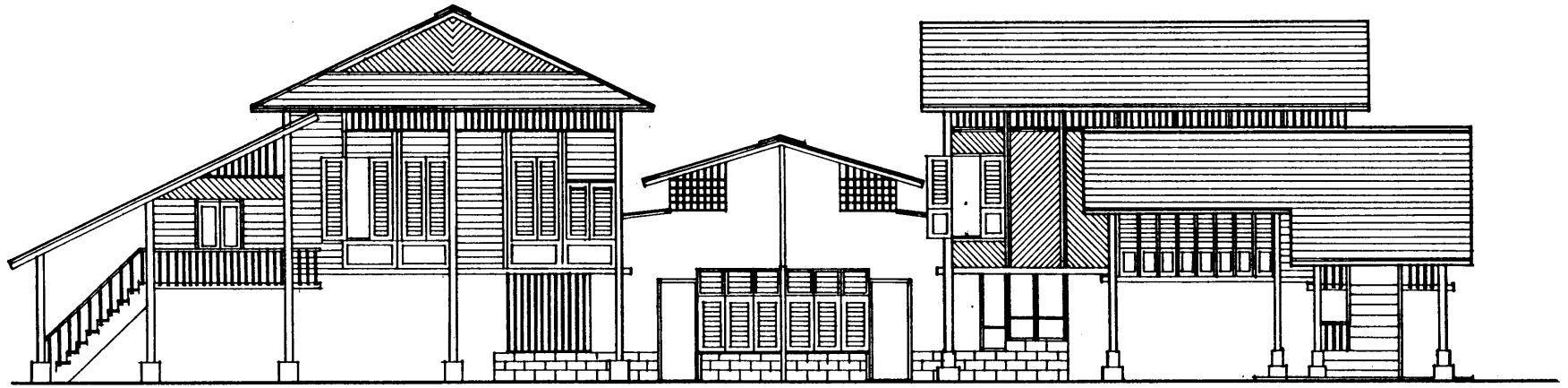
9.17, 9.18, 9.19, 9.20. Early sketches of elevations.



9.19



9.20



9.21

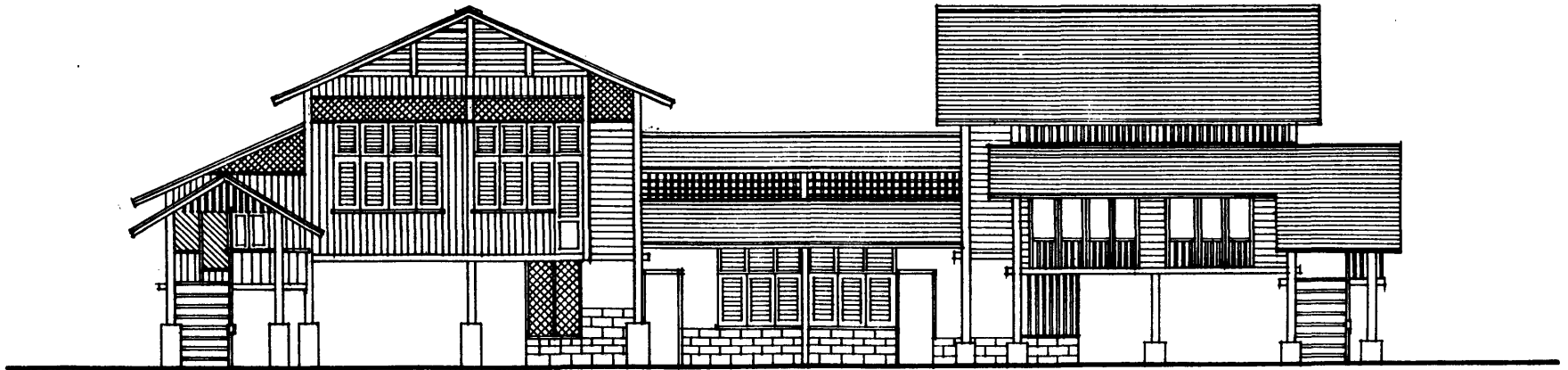


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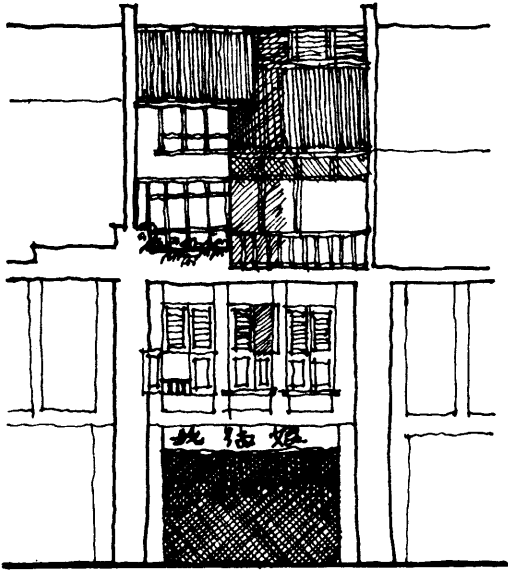
9.21, 9.22, 9.23, 9.24. Elevations of final design.



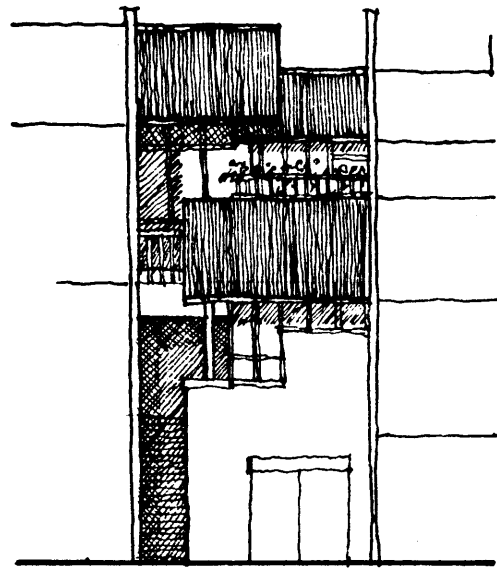
9.23



9.24

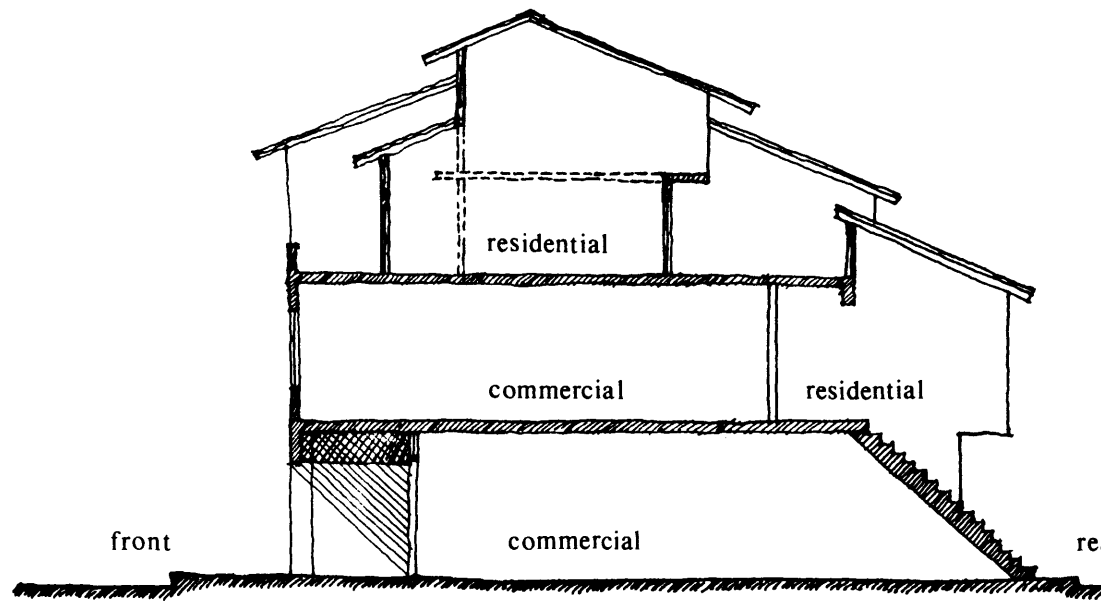


FRONT ELEVATION



REAR ELEVATION

SECTION



9.25. The shophouse incorporates both residential and commercial activities.

So as to provide a formal continuity with the larger urban environment, other familiar building types are employed for the commercial and public buildings. For examples of public buildings in the Malaysian context, refer to the descriptions of mosques and palace architecture in chapters 3 and 5. The urban shophouse as a building type is described in Appendix B. Similarly, the outdoor market common to most Malaysian towns and cities is used as a reference when designing the large outdoor space.

10.0



10.0. The commercial zone intensifies the main vehicular path through the site.

Chapter 10: Site Organization - The Collective Scale

As the service cores are deployed across the site, they provide a structural basis for a field organization. Repetition of this form at an infrastructural level provides a coherent framework for the growth of individual units. By the time the units are completed, the repetitive nature of the concrete service cores will be obscured by the residents' infill, which, in many cases, will completely surround the core. An organizational unity, however, will remain, for the cores provide a scale reference and define the basic positioning of houses for construction.

The patterns of circulation throughout the site may be thought of as a hierarchy of pathways, with various activities zoned to different areas,

creating pathways of different character. The main commercial route (and thereby the widest and most heavily trafficked) parallels the stream and the contours of the hill and connects to an existing three-way intersection to the south and to a road with a number of shops along it to the north. Being the only thoroughfare for outside automobile traffic, this road defines the "village center". It is intersected in the middle of the site by the main pedestrian paths. It is at this meeting of internal and external that large-scale activities occur. It is here that public buildings such as the mosque and health care center are grouped, adjacent to the largest outdoor space which serves as a market. Smaller internal foot paths connect the main paths to residential automobile accessways, and to courtyards, around which the houses are grouped.



10.1

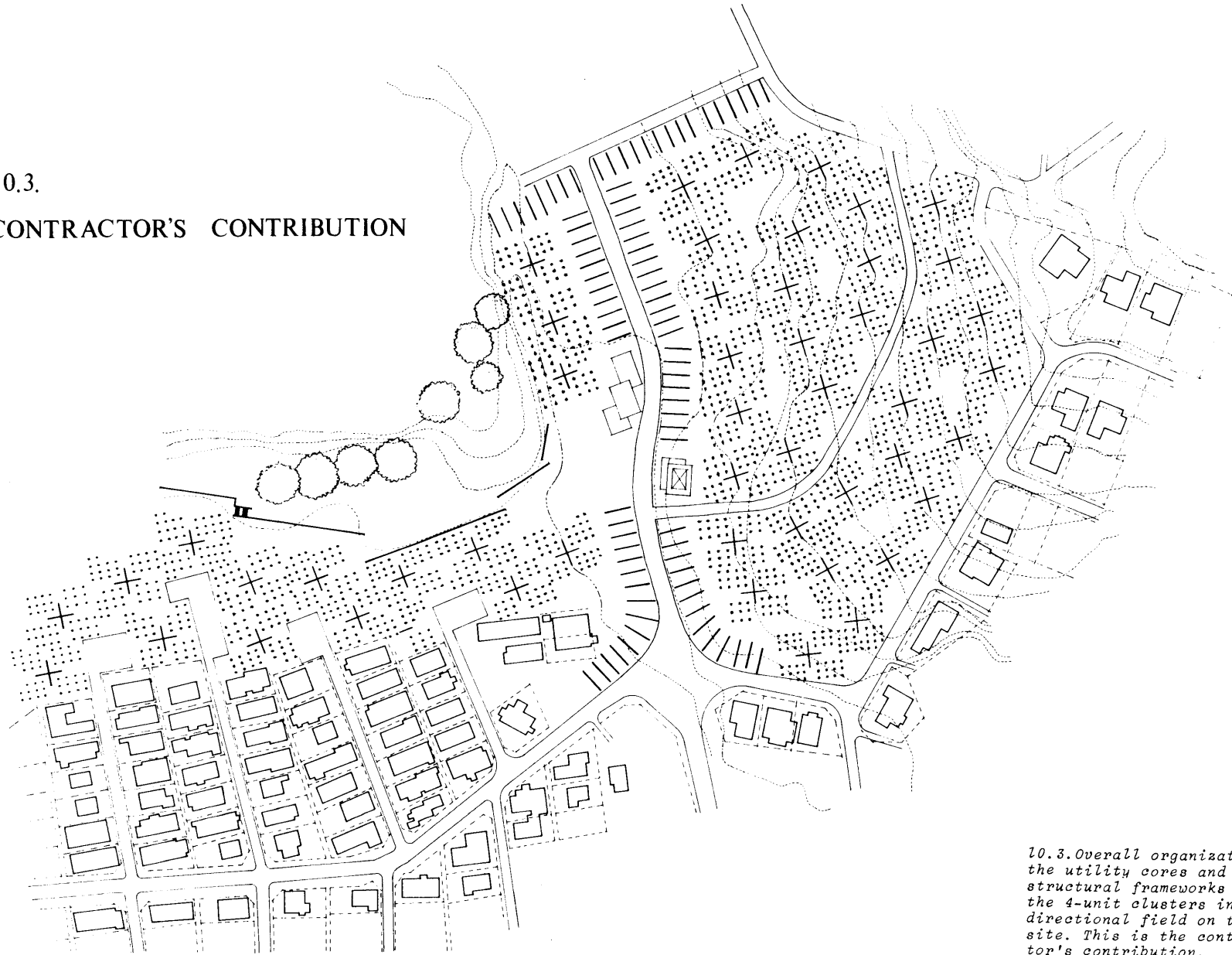
10.1, 10.2. Identifying key directionalities on the site.

70.2



10.3.

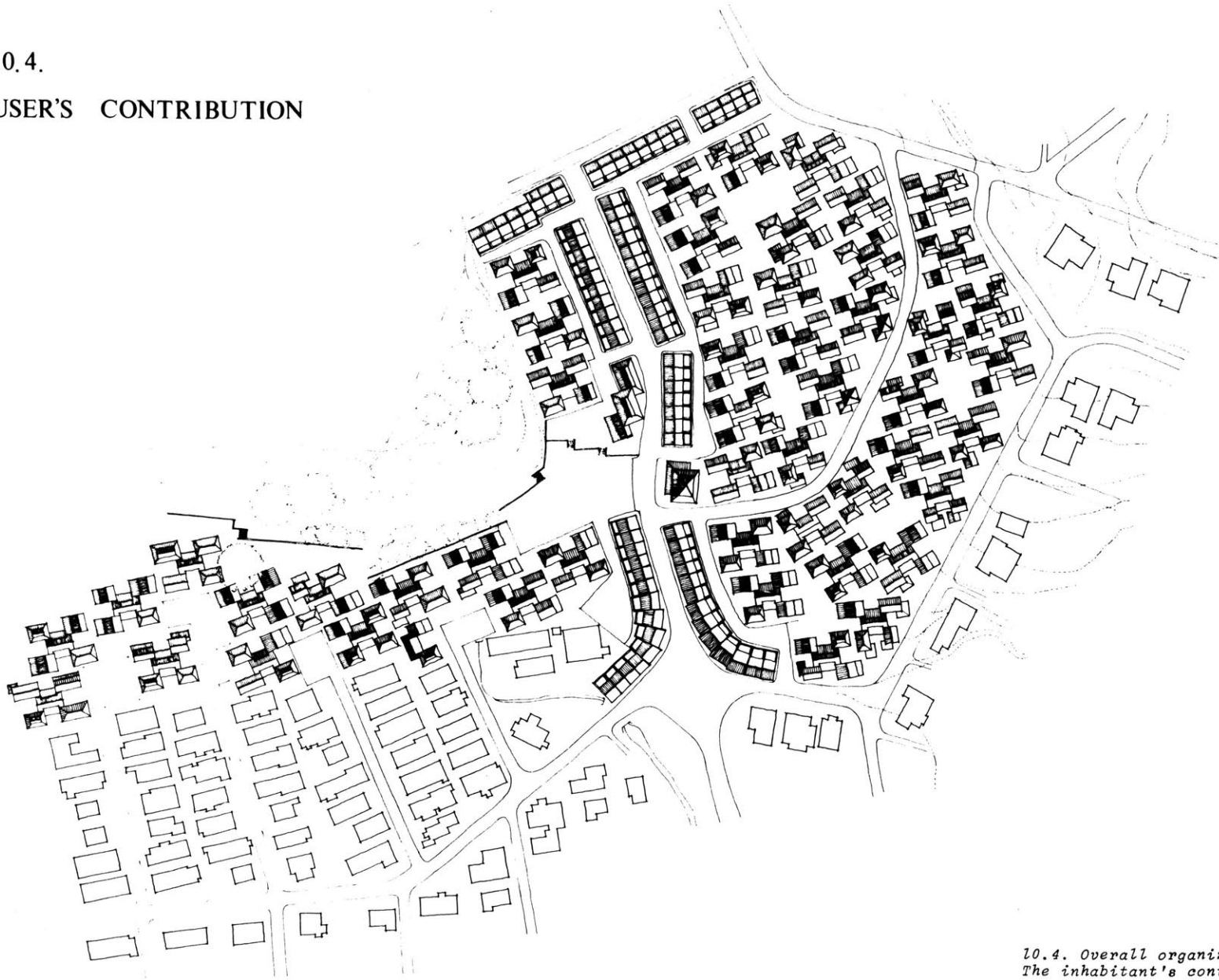
CONTRACTOR'S CONTRIBUTION



10.3. Overall organization: the utility cores and structural frameworks of the 4-unit clusters in a directional field on the site. This is the contractor's contribution.

10.4.

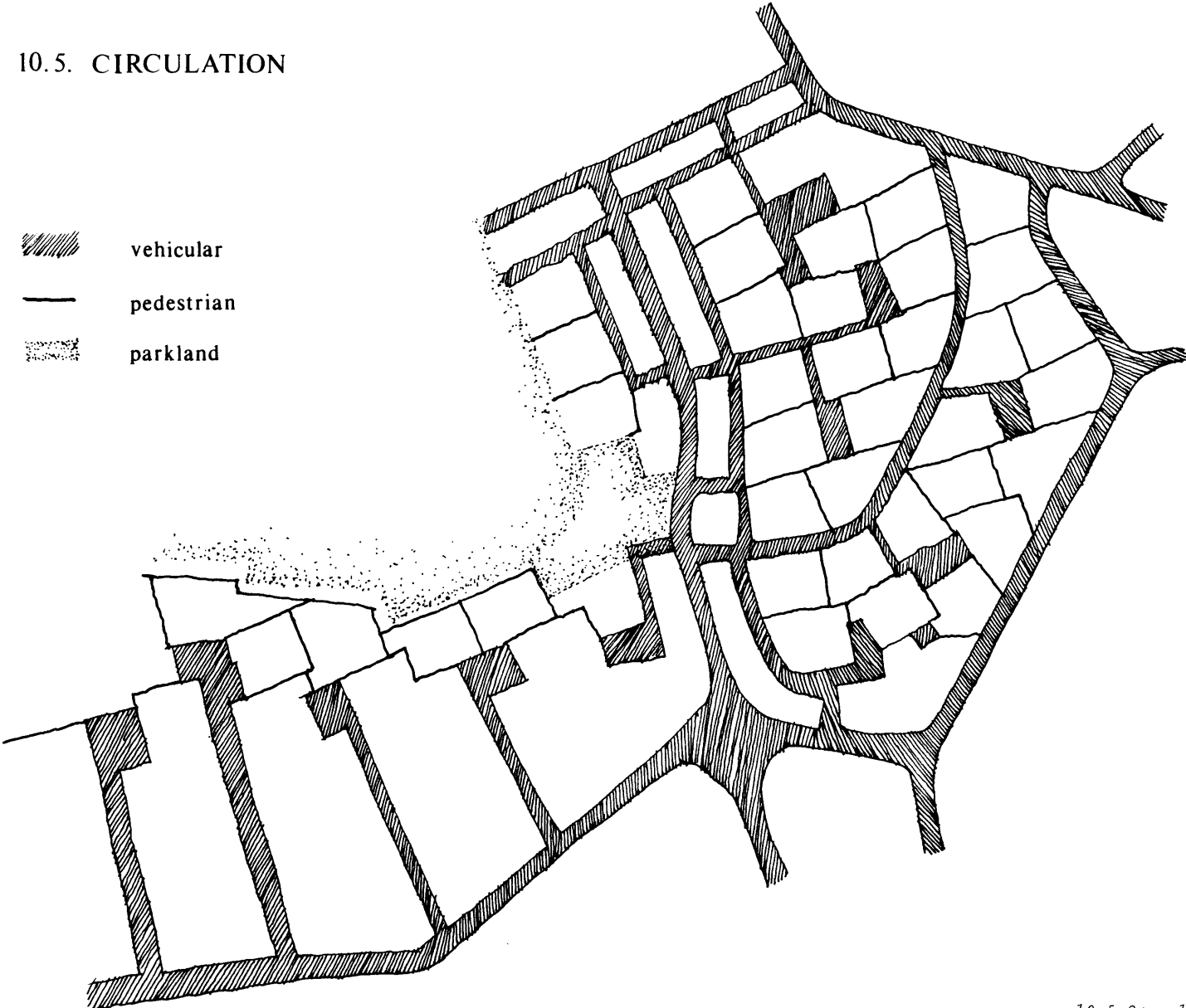
USER'S CONTRIBUTION



*10.4. Overall organization:
The inhabitant's contribu-
tion.*


10.5. CIRCULATION

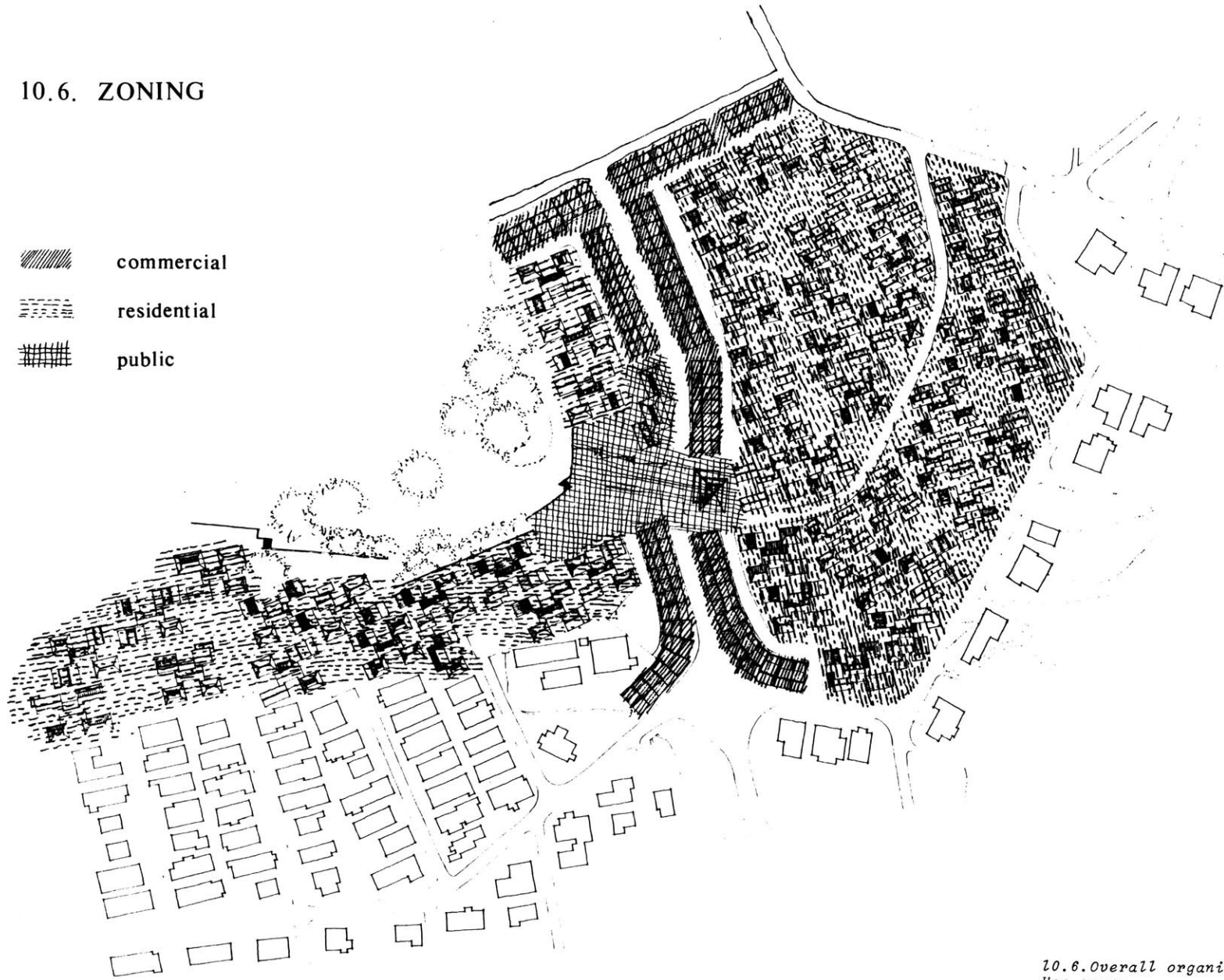
- vehicular
- pedestrian
- parkland



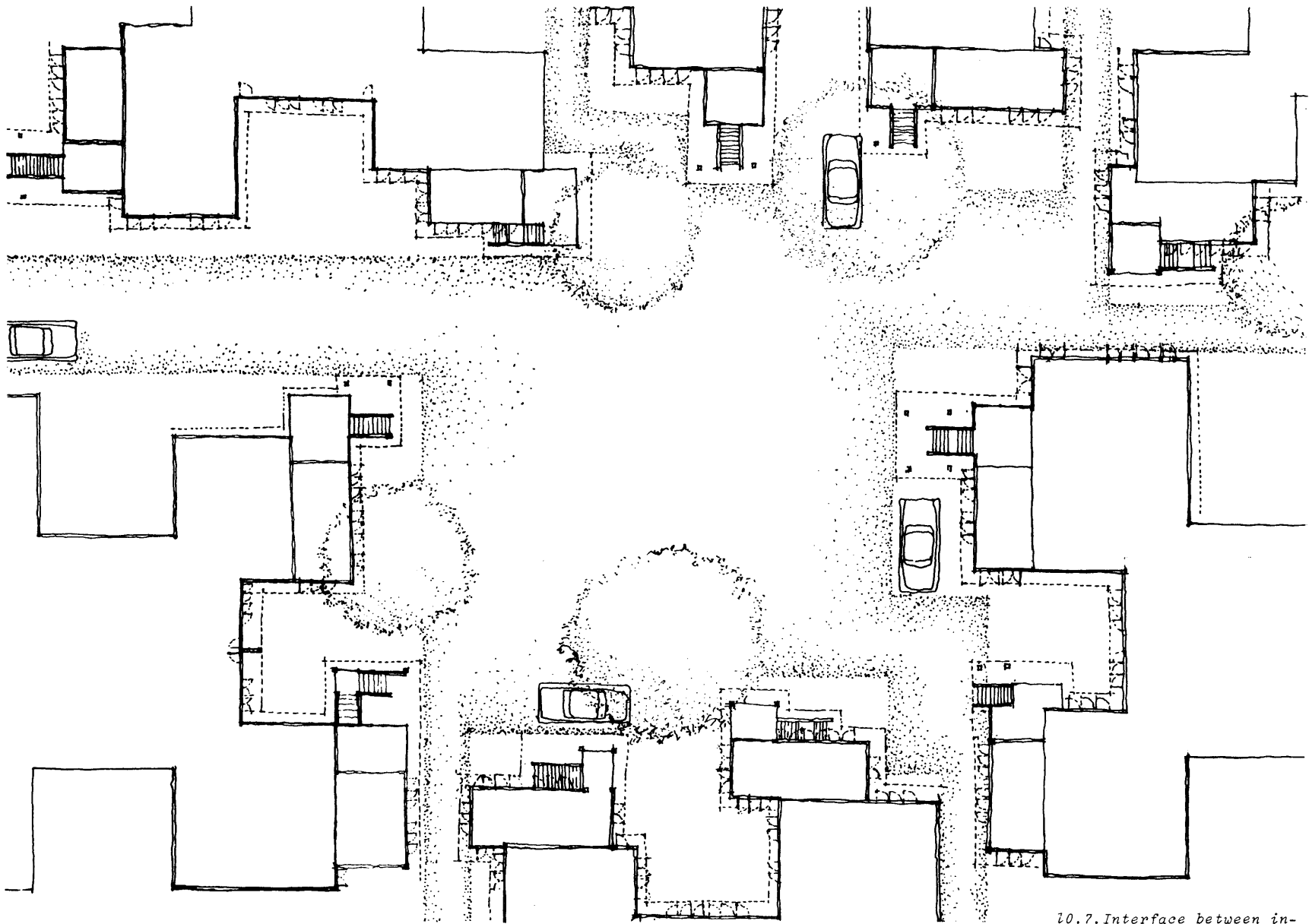
10.5. Overall organization:
Circulation paths.

10.6. ZONING

-  commercial
-  residential
-  public

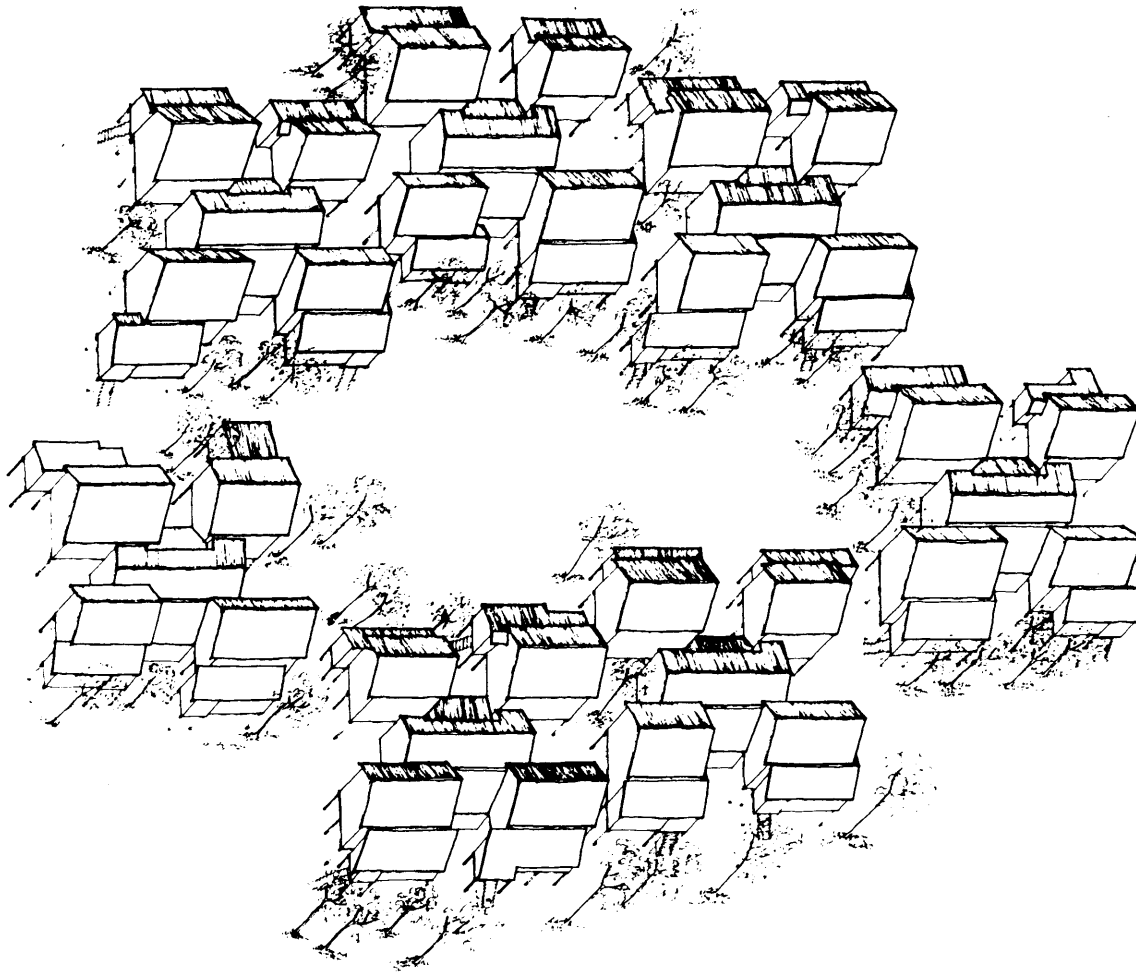


*10.6. Overall organization:
Use zones.*



10.7

10.7. Interface between indoors and out; the character of the communal space is determined by the buildings which surround it.



70.8

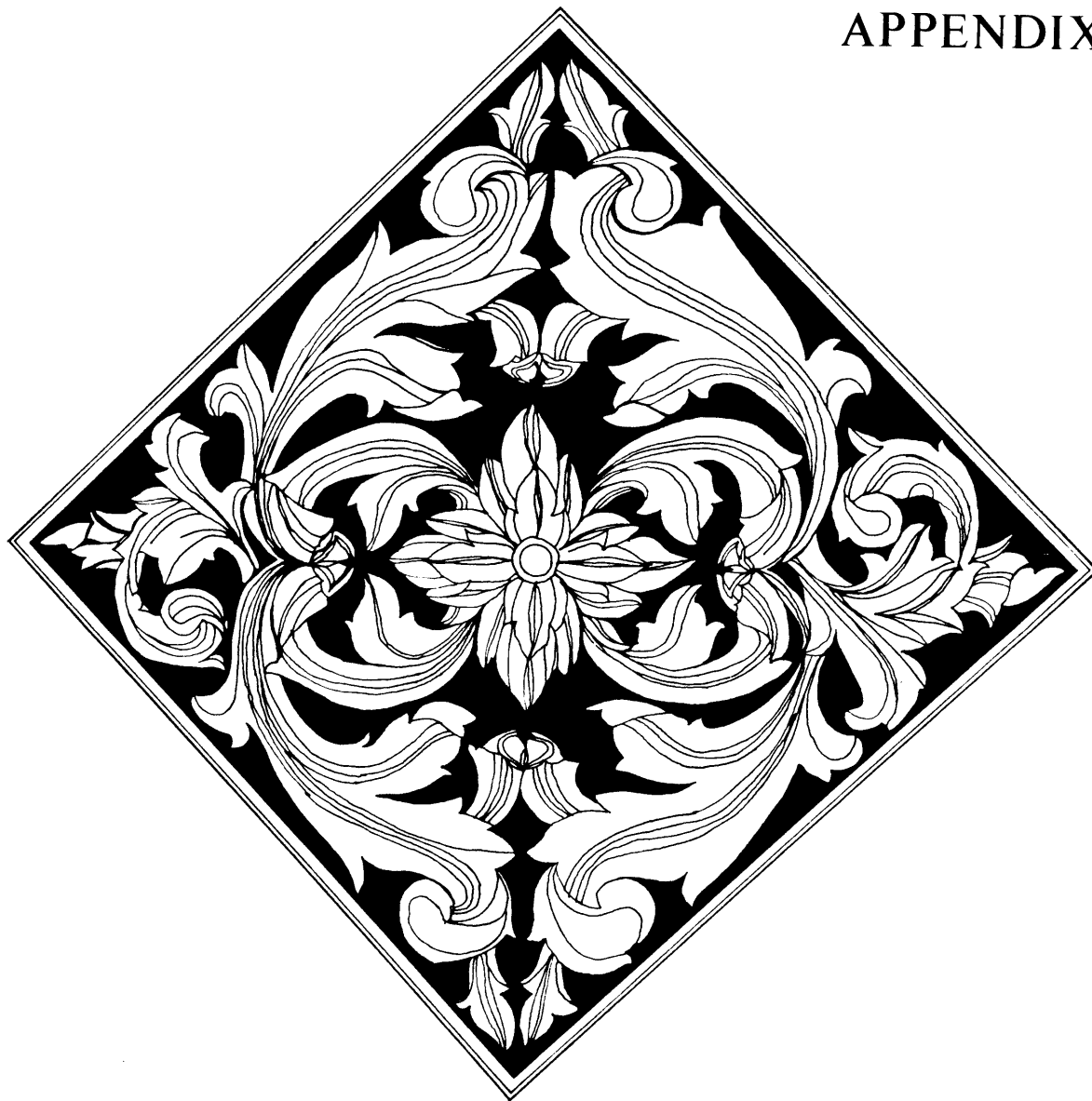
Due to the nature of the non-rigid (and in some cases, non-existent) territorial definitions in Malay settlements, it is best that this aspect of the environment be left to the residents as well. Therefore, to study the shared spaces which constitute a typical courtyard, it is less important to examine what is built outside (for usually nothing is), and more worthwhile to look at the interface between indoors and out, private and public and its effect on the character of the space. Attention has been given to maximizing the exposure of the anjong and serambi to the outdoor space which they will partially define. Entryways need not be directly from the courtyard, so long as other suitable connections can exist between the inside of the house and the courtyard. In this manner, the Malay tradition of hospitality towards neighbors will be encouraged by an environment conducive to neighborly interactions.

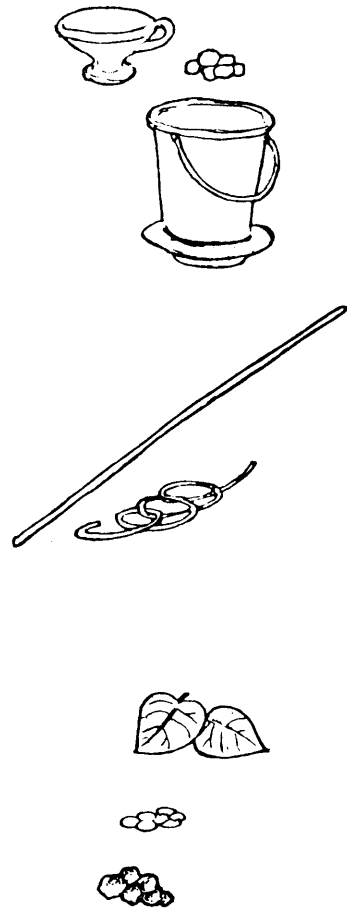


10.9

10.9. The commercial zone at street level with residential use above.

APPENDIX





A. 1

A.1. Some implements used in the searching for the base of the house.

A

The Spiritual Aspect of House Building: Rites, Rituals, and Taboos

Before the coming of organized religions, the Malays believed in the existence of a vital force ("semangat") in all men, animals, places and things. All things,

"have 'semangat', from particular objects, such as a certain tree or rock, to the more general, as in the rice field ceremony when the spirit of the seed rice was carefully preserved for the following year's crop."⁹

They feared these spirits, and whenever possible, tried to avoid disturbing them.

In choosing the site for a house, one is careful that it does not coincide with the spirits' abodes or thoroughfare, so as to avoid in-

curing their anger. Criteria for selecting a site include signs of other creatures living on the site, such as birds' nests, beehives, spiderwebs, and the like. Trees should be leaning away from where the house is to be placed (especially so for coconut trees) and the land should slope slightly, preferably lower on the north side and higher on the south. No "parit buta" ("dead" drainage ditch) or "perigi buta" ("dead" pond or well) and no logs or stumps should be on the site. When these conditions are satisfied, one proceeds to the ceremony for "searching for the base of the house."

(The following descriptions of ceremonies are adapted from Philip Gibbs unpublished report, "The Traditional Malay House as a Systems Building" from the Universiti Sains Malaysia, 1974, and from Wan Burhanuddin bin Wan Abidin's unpub-

lished report, "The Malay House Construction -- The Ritual Approach", May 1980).

SEARCHING THE BASE OF THE HOUSE:

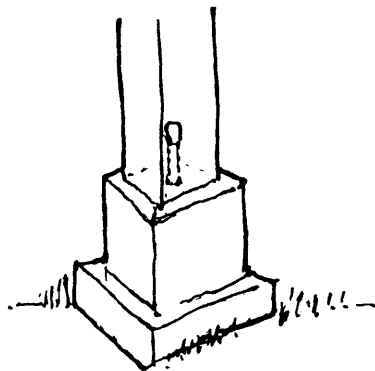
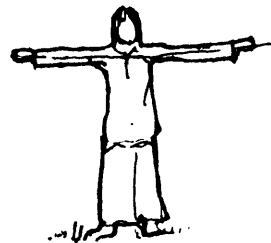
The ceremony is held at night, usually after sunset and before 8:00 p.m. Incense is placed in a container filled with embers and burned. The woman of the house takes a stick and measures it to one "depa" (the span from fingertip to fingertip of outstretched arms). She also takes some ratan (rope) and measures it to one "depa". The ratan is then tied to the stick. More incense is burnt and the stick with the ratan tied to it is planted in the ground at the chosen spot. A pail filled with water is placed near the stick. The ceremony closes with the reading of a prayer.

After dawn and usually before sunrise, the woman of the house measures

SEARCHING THE BASE OF THE HOUSE



A. 2



A. 3

the stick that had been planted. If the stick has lengthened during the night, the spot is suitable. If the stick is shorter, then it is unsuitable. The ratan is also measured. The water in the pail is examined. If the water has overflowed, it is a good location. If the water has diminished, it is unsuitable. If the spot has been demonstrated to be suitable, then the "tiang seri" (the center column) will be placed where the stick was planted.

MATERIALS:

There are rules guiding the choice of materials that, if followed, ensure peacefulness for the future inhabitants. Examples of these are:

1. Logs indented with parasitic creepers are not to be used in any part of the house.
2. Should attap be used for roofing material, it should not be woven during the period of the new moon.

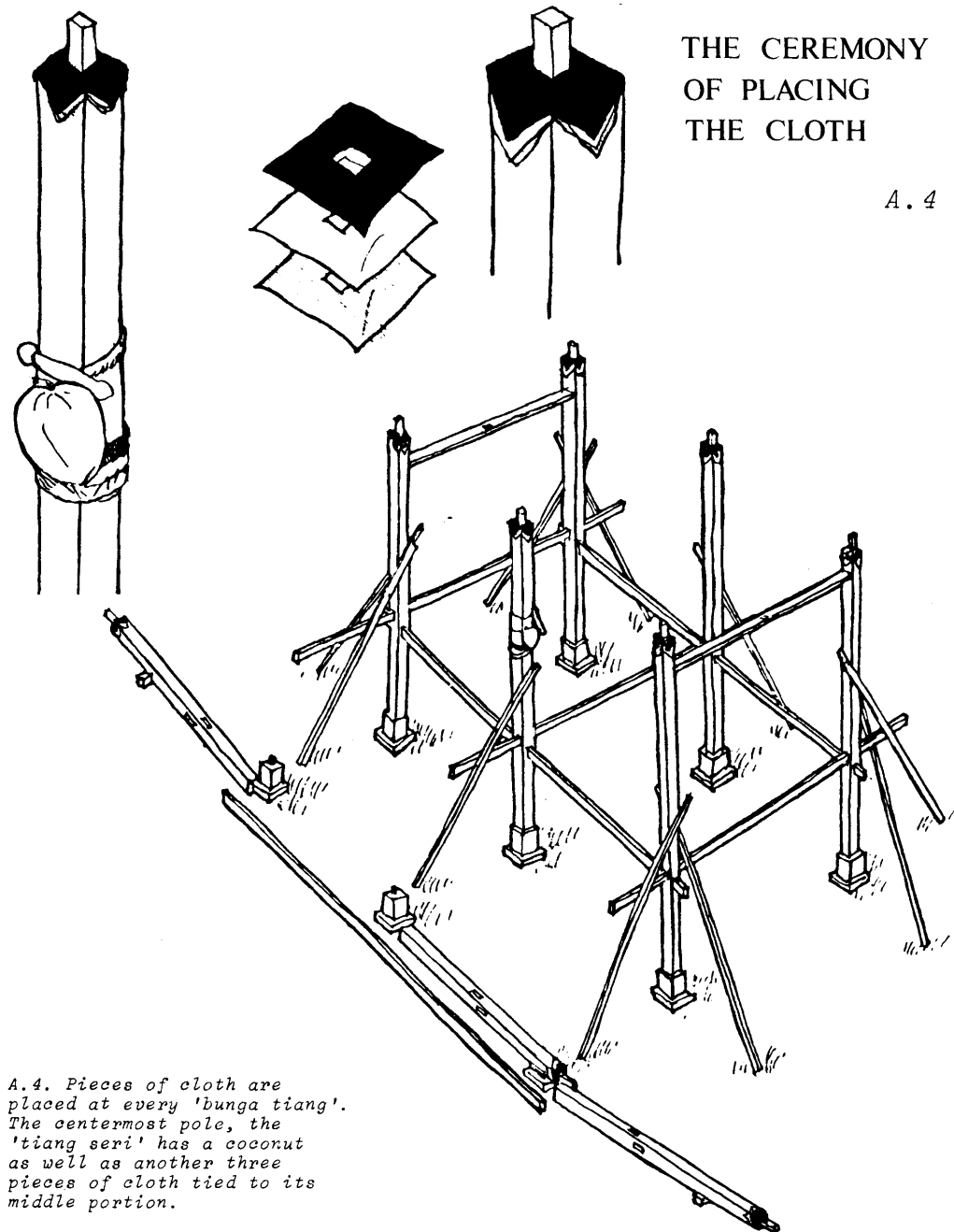
ERECTING THE HOUSE:

The searching of the base having been completed, the site is then cleared and the "pelapit tiangs" (plinths) are arranged. The "tiangs" (columns) are laid out on the ground according to the pelapit tiangs. A good day is chosen for erecting the house, usually a Monday or a Wednesday. The "bomoh" (medicine man), car-

penters and neighbors gather for the ceremony of "memuleh rumah" (erecting the house).

The bomoh first smokes the tiang seri with incense. Using a chisel, he sprinkles it with water, then he places "tepung tawar" (face powder) and "sintuk limau" (a local fruit) on it. The tiang seri is the first member to be erected. It is the most important as the Malays believe that happiness depends on the tiang seri. Usually before its erection, the owner of the house has a yellow rice "kenduri" (feast) to which the bomoh is invited.

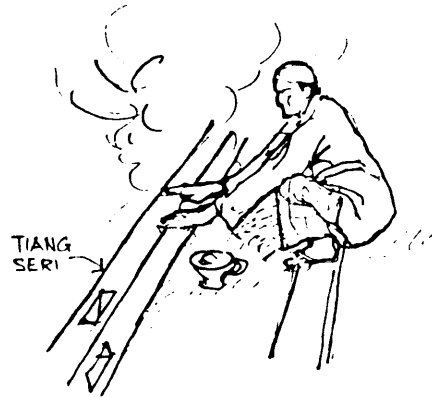
As the tiang seri is being lifted into place, the woman of the house is asked to touch it as a sign that the house belongs to her. This is also an admission from the woman that it will be her responsibility to care for the house when it is



THE CEREMONY OF MEMULEH RUMAH



A. 5



completed. Silver coins are placed under the tiang seri, and some suggest that this is to ensure the success of the builders of the house.

ROOF ASSEMBLY:

The roof is symbolically the protector of the house but it is also the dwelling place of evil spirits. In cases where these spirits are reared by man, the keepers will deliver their offerings and sacrifices to the space where these spirits are kept. When there is a prolonged death, incantations are recited and the roofing materials of the house the person is in are stripped one by one to hasten the death (releasing the trapped spirit). Not much is known about the rituals of roof construction but the rules described below are adhered to because of the special spiritual position attributed to

the roof.

1. The first element of any roofing component (rafter, purlin, roofing material) should not slip and fall on the ground. If it does, work has to stop and can only be continued the following morning.
2. Should there be an eclipse of the sun or moon during construction, the entire roof has to be dismantled and further construction can only resume after the eclipse.
3. No rafter should be placed at the dead center of a doorway.

LAYING THE FLOOR:

Not much is known about the rites in this step but the general rule is that the laying down of the first floor board has to be precisely timed.

FITTING THE STEPS (LADDER):

The rule observed here is that the

number of treads (or rungs) should not be even, regardless of the dimension of the risers.

WALL CONSTRUCTION:

The first wall component used should not fall on the ground. If woven bamboo is used as wall panels, a design called "gajah bertembung" (elephants in a duel) cannot be used. This motif is usually reserved for palaces because the energy created by the pattern is not suitable for dwellings.

DOORS AND WINDOW LEAVES:

If a door is not constructed right, evil spirits dwell in it. The spirits would sometimes hide people ("disembunyi hantu") behind the door and sometimes it would take days before the person is found. Door and window leaves have to be completed and fixed in

their respective places before the house is occupied.

MOVING IN:

Moving into a new house has to be very carefully done so as to not upset the natural balance of forces created by the building elements in the interior spaces. An appropriate time has to be selected and a test performed before moving in.

Test:

1. A charm is recited and a bowl of water is left overnight in the center of the ibu rumah (main space). The water level is noted.
2. The water level is observed the following morning. If it has dropped or if the surrounding area is sprinkled wet, then the house is not suitable to be moved into as yet. The master carpenter is called on to find out ways to appease the "semangat rumah"

(spirit of the house). The bowl test is repeated until the intervention is permissible.

A feast is held near the vicinity. A Koran is brought into the house and placed in a respected position. Sleeping items are brought in, beginning with the pillows and then whatever one sleeps on. Kitchen utensils are brought in, beginning with what one cooks in, followed by the rest. The remainder of the owner's belongings are brought in. When everything is in order, another feast is held to commemorate the beginning and end of another event.

TABOOS:

Taboos pertaining to buildings are numerous. Below are a few:

Construction:

1. The door of the "serambi" (guest space) must not be in line with the door of the "ibu rumah"

(main space).

2. Bathrooms and toilets/outhouses must not be in the shadow of the living spaces.

3. The kitchen floor is to be lower than other floors. The bathroom is on the ground.

Social:

1. No whistling is allowed in the house.

2. Umbrellas may not be opened in the house.

3. Floors may not be swept at night.

4. No corpse is to be brought into the house if one dies elsewhere.

The final rites should be performed in a mosque. The rites are only performed in the house if one dies under its roof.

5. The "bendul" (cross beam at the floor level) should not be sat on, especially by any pregnant woman.

6. No standing on the ground with arms resting on the steps leading into the house.

7. When coming into and leaving a house at night, a charm is recited.

8. A charm is also recited when opening a window and another one for closing it.

B

Urban Settlements and the Chinese House

In marked contrast to the informality of the Malay kampong, Malaysia's towns and cities are rigidly structured, with well-defined circulation systems and property boundaries. The disparity between urban and rural forms of settlement is not surprising since the urban systems are not indigenous, but are based upon an imported model. Although influenced by the British colonialists, Malaysia's cities are basically Chinese in their forms, having grown up to accommodate Chinese immigrants in the late nineteenth and early twentieth centuries.

Despite the fact that most of the Chinese immigrants were from rural areas in southern China, it has

been suggested that their frames of reference were quite different from those of the rural Malays, and, as such, they could be thought of as urban people. In China, there was an orientation toward the city in that even in more remote areas there were strong social and economic ties between town and country. The clearly differentiated house lots and rectilinear circulation systems of Chinese settlements are an outgrowth of the concept of land as a commodity, an idea quite alien to the Malays of the nineteenth century. (When it was necessary to place a value on Malay land, it was usually in terms of the number of fruit trees on the land or the amount of rice which could be planted, and thus it was production-oriented rather than market-oriented). This may be viewed as a cultural difference, for such "money-mindedness" is an aspect of the strong commercial tradition of southern China.

A comparison between the traditional Chinese city and the larger Malay settlements further illustrates the contrast between urban attitudes. The Chinese city is based upon a medieval form: a perimeter wall enclosing a dense urban space, often laid out in a grid. It is easy to understand how such a structure can affect a society's urban mentality by promoting the idea of boundary definition. The residential areas surrounding a Malay palace (this is as close as the Malays came to an indigenous urban form) had an altogether different character. This type of a city was arranged centrifocally, with the palace and the mosque at the core, enclosed by a residential ring housing those who immediately served the palace complex. This ring was, in turn, surrounded by more houses, eventually dissipating into a sprawling group of kampongs.



B. 0

B. 0. Petaling Street, Kuala Lumpur in the early 20th century.



B. 1



B. 2

As this sort of settlement was based upon the idea of service to the court, it bears little resemblance in economic terms to the commercial city of southern China. It is interesting to note that the Malay word used today to mean a town or city was originally "bandar", in reference to a marketplace and not to a residential area. This may be indicative of the Malay attitude toward the imported urban form. The term "kampong" (village) is still used to denote housing, whether rural or urban.

As part of the cultural transplantation which accompanied immigration, the Chinese urban house form was introduced to Malaysia. Developed in an urban context, the Chinese house is characteristically inward-looking. It is built of masonry, with spaces oriented about an interior courtyard (or series of courtyards in larger houses). As these houses

are arranged as rowhouses along the street, they are often disproportionately deep and narrow, making the courtyard practical for bringing light and air into the interior of the structure. The heavy exterior walls and interior openness are consistent with Chinese attitudes toward family and society. There is a strong emphasis on privacy between neighbors but not between members of one's own close-knit family. The idea of distancing oneself from neighbors by using strong physical definition may be interpreted in part as a response to the crowded conditions of urban life, rather than solely as a cultural proclivity.

The density of house frontages along the street makes these buildings particularly applicable to commercial use as shophouses. Often, the first floor (usually used as a formal hall for receiving guests,



B. 3



B. 4

B.5. Living quarters above a shophouse.

with servants' quarters or kitchen behind) is replaced by a small shop or godown (warehouse) while living quarters are maintained upstairs. Such an arrangement is very useful to the small businessman for it allows greater family involvement in the business and makes longer hours possible. In addition to the convenience, there is also the increased sense of security which

comes with living above the shop. As British colonial policy encouraged Chinese involvement in the commercial sector of the economy (while maintaining Malays in the agricultural sector) these shophouses came to form the cores of cities throughout the Malay peninsula as well as in other parts of southeast Asia.

B. 5





As the house, in this instance, is defined by the property line, so the block is defined by the streets which border it. In the case of the Malaysian Chinese city, this means a generally rectilinear layout of main roads with back lanes running between rows of houses placed back-to-back. Consistency

of design was encouraged by the regular division of lots for building and by a very strong building-type for a house. Commonly, the fronts of buildings are linked by a covered sidewalk raised slightly above street level (known colloquially as a "five-foot way").

B.6 B.7

B.6., B.7. A block of shop-houses in Kuala Lumpur, as it appeared in 1974 and in 1976.



B. 8

B. 8. A hawker has set up his stand within the "five foot way."

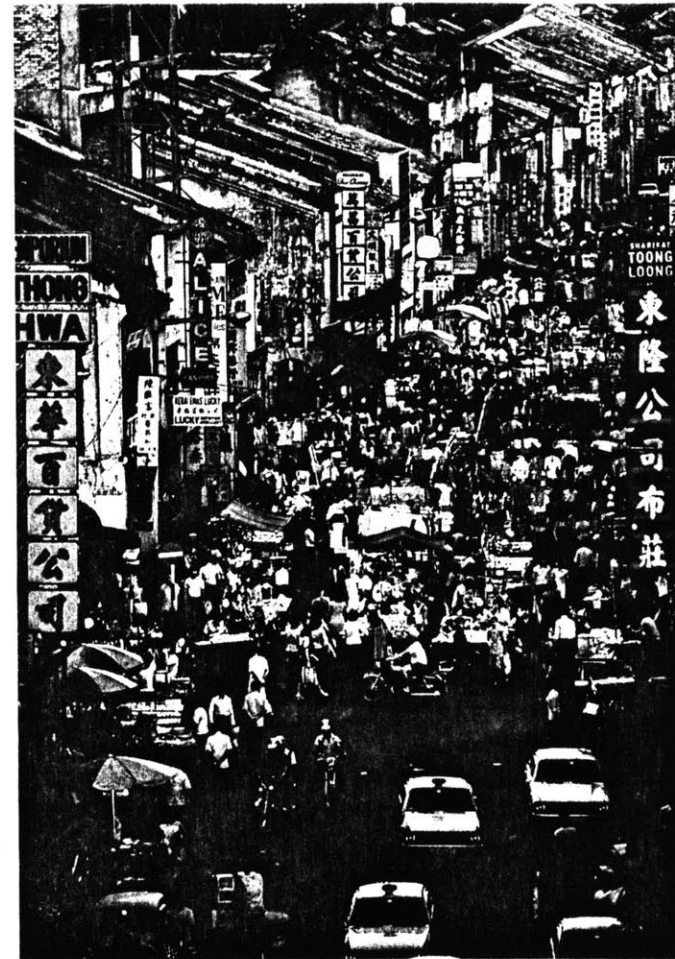
Although suited to the dense urban context, the Chinese house has not, however, been adapted to the climate of Malaysia. This is testimony to the persistence of traditional form, for the great thermal mass of masonry construction and the relatively poor planning for ventilation creates an interior which is particularly hot and damp, exaggerating the conditions outdoors.

Much of this tradition is based upon the ancient practice of Feng Shui (literally, wind and water, two of the four basic elements), the Chinese system of beliefs which tries to balance the intimately related energies of nature, so as to create an environment in which man is in harmony with his universe. Traditionally, a geomancer was consulted during the planning of a home. Although this practice no longer exists in Malaysia, many of the precepts and attitudes of Feng

Shui have become incorporated into the style and layout of buildings. One climatically inappropriate example is the decree against aligning the front door with interior doors. According to Feng Shui, this prevents an evil spirit from looking all the way into the house and a cultural determinist will explain that this increases visual privacy from the street. This practice, however, slows down the movement of air through the house, impeding any natural cooling which may be derived from the breeze.

As the Chinese have traditionally dominated Malaysia's cities it is not surprising that buildings being constructed today are regulated by codes and ordinances of Chinese origin. Parallels may be drawn between contemporary housing estates and older Chinese settlements. This is as true of larger scale planning (division of land and

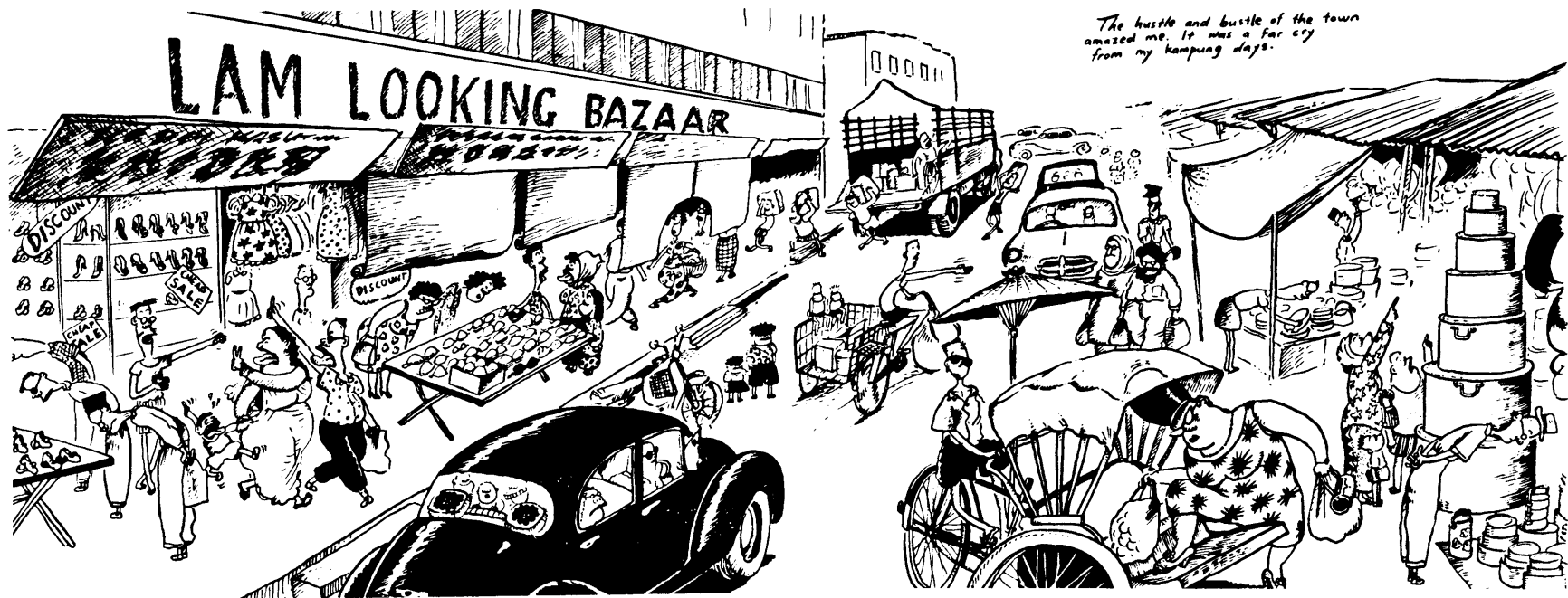
B.9. Petaling Street as it appears today (see B.0 for comparison). The street is filled with an open air night market, or "pasar malam", common to most Malaysian cities.



B.9

layout of roads and back lanes) as it is of the smaller scale (built separation between neighbors and a strong bias against wood construction). Such tendencies exclude the possibility of creating a built environment consistent with another cultural system, such as might be appropriate for a community of

urban Malays. Although it is more than likely that this result is unintentional, Malaysia's cumbersome bureaucracy and the fact that the majority of architects, planners and contractors are traditional urban dwellers, makes it doubtful that any major changes will be forthcoming.



FOOTNOTES

- ¹Winstedt, R., The Malays-A Cultural History, London, 1947.
- ²Rapoport, Amos, House Form and Culture, Prentice Hall, Inc., New Jersey, 1969, p. 5.
- ³Lim, Heng Kow, The Evolution of the Urban System in Malaya, Penerbit Universiti Malaya, Kuala Lumpur, 1978, p. 210.
- ⁴Goh, B.L. and Hans-Dieter Evers, Landownership and Urban Development in Butterworth, Project Paper Series, Center for Policy Research, Universiti Sains Malaysia, Penang.
- ⁵Evers, Hans-Dieter, "Differing Concepts of Settlement Patterns - The Malay and Chinese in Malaysia," Ekistics, 263, October 1977, p. 221.
- ⁶Tan, Joceline, "Design Guidelines for Residential Space," Student Initiated Research, Universiti Sains Malaysia, Penang, 1981, p. 79.
- ⁷Shepard, Tan Sri Mubin, "Traditional Malay House Forms in Trengganu and Kelantan," Journal of the Malayan Branch of the Royal Asiatic Society, Vol. XLII, Part 2, 1969, pp. 1-28.
- ⁸Hilton, R.N., "The Basic Malay House," Journal of the Malayan Branch of the Royal Asiatic Society, Vol. XXIX, Part 3, 1956, pp. 134-155.
- ⁹Ryan, N.J., The Cultural Heritage of Malaya, Longman, Kuala Lumpur, 1971.

BIBLIOGRAPHY

Books:

- Alexander, Christopher, et al., A Pattern Language, Oxford University Press, New York, 1977.
- Alexander, Christopher. The Timeless Way of Building, Oxford University Press, New York, 1979.
- Batchelor, James P., "Landscapes as References for Design," M.Arch. Thesis, MIT, 1981.
- Burhanuddin, Wan bin Wan Abidin, "The Malay House: Rationale and Change," S.M.Arch.S. Thesis, MIT, 1981.
- Engel, Heinrich, The Japanese House: A Tradition for Contemporary Architecture, Tuttle, Japan, 1964.
- Fathy, Hassan, Architecture for the Poor, The University of Chicago Press, Chicago and London, 1973.
- Freeman, Fox and Associates, Summary Report: Six New Towns in Pahang Tenggara, 1976.
- Geertz, Clifford, Islam Observed, The University of Chicago Press, Chicago and London, 1968.
- Hashim, Wan, A Malay Peasant Community in Upper Perak: Integration and Transformations, Penerbit Universiti Kebangsaan Malaysia, Kuala Lumpur, 1978.
- Koenigsberger, Otto H. et al., Manual of Tropical Housing and Building, Longman Group, Hong Kong, 1973.
- Koenigsberger, Otto H. and Robert Lynn, Roofs in the Warm, Humid Tropics, Lund Humphries, London, 1965.

- Lim, Heng Kow, The Evolution of the Urban System in Malaya, Penerbit Universiti Malaya, Kuala Lumpur, 1978.
- McGee, T.G., The Southeast Asian City, G. Bell and Sons, Ltd., London, 1967.
- Manjit Singh Sidhu, Kuala Lumpur and its Population, University of Malaya Press, Kuala Lumpur, 1978.
- Moholy-Nagy, Sibyl, Native Genius in Anonymous Architecture in North America, Schocken Books, New York, 1976.
- Norberg-Schulz, Christian, Genius Loci: Towards a Phenomenology of Architecture, Rizzoli, New York, 1979.
- Oliver, Paul (ed.), Shelter, Sign and Symbol, The Overlook Press, Woodstock, New York, 1977.
- Osten, Robert J., Jr., "Architect and Owner-Builder: An Approach to Designing for a Synergetic Building Process," M.Arch. Thesis, MIT, 1977.
- Provencher, R., Two Malay Worlds: Interaction in Urban and Rural Settings, Berkeley, 1971.
- Rapoport, Amos, House Form and Culture, Prentice Hall, Inc., New Jersey, 1969.
- Rudofsky, Bernard, The Prodigious Builders, Harcourt Brace Jovanovich, New York and London, 1977.
- Ryan, N.J., The Cultural Heritage of Malaya, Longman, Kuala Lumpur, 1971.
- Tan, Joceline, "Design Guidelines for Residential Space," Student Initiated Research, Universiti Sains Malaysia, Penang, 1981.
- Tan, Soo Hai (ed.), Public and Private Housing in Malaysia, Heineman Asian, 1979.
- Turner, John F.C. (ed.), Freedom to Build, Macmillan, New York, 1972.
- Wang, Gung Wu, Malaysia: A Survey, Praeger, New York, 1965.
- Winstedt, R., The Malays-A Cultural Heritage, London, 1947.
- Yeh, Stephen H.K. and A.A. Laquian (eds.), Housing Asia's Millions: Problems, Policies and Prospects for Low-Cost Housing in Southeast Asia, The International Development Research Center, Ottawa, 1979.

Articles:

- Burhanuddin, Wan bin Wan Abidin, "The Malay House Construction-The Ritual Approach," Unpublished Report, 1980.
- Evers, Hans Dieter, "Differing Concepts of Settlement Patterns-The Malay and Chinese in Malaysia," Ekistics 263, October 1977.
- Gibbs, Philip, "The Traditional Malay House as a Systems Building," Unpublished Report, Universiti Sains Malaysia.
- Hilton, R.N., "The Basic Malay House," Journal of The Malayan Branch of the Royal Asiatic Society, Vol. XXIX, part 3, 1956, pp.134-155.
- Martin, Richard, "The Architecture of Underdevelopment or the Route to Self Determination in Design," Architectural Design, October 1974.
- Morley, P.G., "Malay Timber Buildings (2)," PETA, Journal of the Federation of Malaya Society of Architects, Vol. I, No. 2, November 1955.
- , "Two Minangkabau Timber Houses," PETA, Journal of the Federation of Malaya Society of Architects, Vol. 2, No. 2, March 1958.
- Posener, Julius, "House Traditions in Malaya," Architecture Review, Vol. 130, October 1961, pp. 280-283.
- Shepard, Tan Sri Mubin, "Traditional Malay House Forms in Trengganu and Kelantan," Journal of the Malayan Branch of the Royal Asiatic Society, Vol. XLII, part 2, 1969, pp. 1-28.
- Sherwin, Dean, "Malay Roof Forms and Ventilation," Majallah Akitek, 1:78.
- , "The Pyramidical Mosque," Majallah Akitek, 1:81.
- Soon, Tay Kheng, "Lowrise High Density Housing-An Example," University of Singapore School of Architecture Journal, No. 2, January 1980.
- Southeast Asia Chronicle, No. 66, Jan.-Feb. 1979, and Pacific Research, Vol. 9, No.5-6, July-Oct. 1978 (joint publication), "Changing Role of Southeast Asian Women: The Global Assembly Line and the Social Manipulation of Women on the Job."
- Southeast Asia Chronicle, No. 72, "Malaysia: What Price 'Success'?", April, 1980.

-----, No. 75, "Islam: Resurgence and Resistance in
Southeast Asia," October 1980.

Students of the School of Housing, Building and Planning, "Telok Kumbar
Report," Universiti Sains Malaysia, Penang, 1973.



SOURCES OF ILLUSTRATIONS

All photographs, unless otherwise noted, are from the collection of Michael Leaf and Teck Neo Choo.

- 0.1 Guide to Kuala Lumpur Notable Buildings, P.A.M., p. 19.
- p.11 Illustrated Historical Guide to Melaka, p. 68.
- 1.2,1.3 Illustrated Historical Guide to Melaka, p. 57 and p. 101.
- 1.4,1.5,1.6, Guide to Kuala Lumpur Notable Buildings, P.A.M., p. 55, p.31, and p. 48.
- 2.0 Garispanduan dan Strateji Perlaksanaan Rumah Kos Rendah Bagi Sektor Swasta Dalam Rancangan Malaysia Keempat., Lampiran 1A.
- 2.1 Rekabentuk Rumah Awam Kos Rendah, p.82.
- 2.7, 2.9 Southeast Asia Chronicle, No. 72, p. 5 and p. 4.
- 2.9 'Malaysia Marches on' Mid-Term Review (1979) Third Malaysia Plan, p. 13.
Quotation from 'Measure,' Sept.-Oct., 1980, Mag-zine for the People of Hewlett-Packard.
- 3.1 Majallah Akitek, 1:81, p.44.
- 3.2 Guide to Kuala Lumpur Notable Buildings, p. 38.
- 3.3 Rotch Visual Collections.
- 4.2,4.3 The Southeast Asian City, T.G. McGee, p. 41 and p. 50.
- 4.4 Kuala Lumpur and its Population, Manjit Singh Sidhu, p. 6.
- 4.5,4.6 Guide to Kuala Lumpur Notable Buildings, P.A.M., p. 65 and p. 79.
- 4.7 Southeast Asia Chronicle, No. 72, p. 18.

- p.35 Majallah Akitek.
- 5.0 Summary Report: Six New Towns in Pahang Tenggara, Freeman, Fox and Associates, cover.
- 5.1 The Southeast Asian City, T.G. mcGee, p. 49.
- 5.2,5.3 Summary Report: Six New Towns in Pahang Tenggara, Freeman, Fox and Associates, p. 27 and p. 130.
- 5.4 Adapted from 'Design Guidelines for Residential Space,' Joceline Tan, p.139.
- 5.5 Summary Report: Six New Towns in Pahang Tenggara, p.4.
- 5.10,5.13,5.14 The Kampung Boy, Lat.
- 5.15 Adapted from 'Design Guidelines for Residential Space,' Joceline Tan, p. 138.
- 5.17, 5.23,5.25, The Kampung Boy, Lat.
- 5.26 Federation Museums Journal, Vol. Vii, 1962, Plate IX.
- 5.27 Majallah Akitek
- 6.0 Drawn from Chow Weng Lim's slides.
- 6.4,6.5,6.6 Adapted from Telok Kumbar Report, p. 50.
- 6.15 Majallah Akitek, 1:81, p.67
- 6.20 Majallah Akitek, 1:77, p. 53, Fig. 1.
- 6.23 Majallah Akitek, 1:77, p. 54, Fig. 5.
- 6.26 Majallah Akitek, 1:77, p. 56, Fig. 9
- 6.27, 6.28 PETA, Journal of the Federation of Malaya Society of Architects, Morley, P. 6 and p. 7, Figs. 6 and 7.
- 6.29, 6.30 Majallah Akitek.
- 6.33 Federation Museums Journal, VII (1962), Figs. 1, 2.
- 6.29, 6.53 The Kampung Boy, Lat.

- 7.0 Adapted from Telok Kumbar Report, p. 49.
- 7.1 Adapted from 'Design Guidelines for Residential Space,' Joceline Tan, p. 38.
- 7.6 The Kampung Boy, Lat.
- 7.12 Majallah Akitek, 1:81, p. 49.
- 7.18 Drawn from Chow Weng Lim's slides.
- 7.19 A Malay Peasant Community in Upper Perak, Wan Hashim, p. 181.
- 7.20,7.21,7.22,7.23 Journal Malayan Branch, (Vol. XXIX, Pt.3, 1956), Royal Asiatic Society, p. 154 and p. 155, Figs. 8,9,10,11.
- 7.24 Drawn from Chow Weng Lim's slides.
- 7.29,7.30,7.31,7.32,7.33,7.34 Journal Malayan Branch, (Vol. XXIX, Pt. 3, 1956), Royal Asiatic Society, pp. 147-152, Figs. 1-6.
- 8.0 Kuala Lumpur and its Population, Manjit Singh Sidhu, p. 67.
- p.141 Majallah Akitek, 1:81, cover.
- A.1,A.2,A.3,A.4,A.5 "The Traditional Malay House as a Systems Building," Phillip Gibbs.
- B.0 Kuala Lumpur and its Population, Majit Singh Sidhu, p. 39.
- B.1,B.2,B.3 Guide to Kuala Lumpur Notable Buildings, P.A.M., p.44, 45.
- B.5 Town Boy, Lat.
- B.6, B.7 Ekistics 278, Sept./Oct. 1979, p. 294.
- B.9 National Geographic, May 1977, p. 642.
- B.10 Town Boy, Lat.