The Structure and Form of Residential Neighborhoods
with special reference to Taiwan.

ABSTRACT

This thesis is divided into four parts. As the original garden city movement fosters the development of residential neighborhoods, Ebenezer Howard's ideas and two experiments of Letchworth and Welwyn have been examined in the first part.

Following the historical analysis of development and evolution of ideas, seven examples of deliberate planning have been chosen from the United States, Britain, Canada, Sweden, and India. For systematic observation, examination of each example has been traced in similar pattern: Concept, Size, Density, Dwelling Units, Schools, Shops, Centre, Open Space, and Articulation.

In Part III, the form of traditional settlement and problems of urbanization in Taiwan have been observed. Since the science of town planning is young in the island and the examples are very rare in this field, the observation of Taiwan is discussed in general.

The final part concludes the value of observation for the exploration of new urban pattern in Taiwan.

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THE STRUCTURE AND FORM OF RESIDENTIAL NEIGHBORHOODS WITH SPECIAL REFERENCE TO TAIWAN

by

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INTRODUCTION

As the result of technological innovations, economic progress and population growth, many cities of the world are growing in size and complexity. To seek a possible and practical approach instead of uncontrolled development, an organic unit in terms of human scale has to be employed in making up the fabric of urban agglomeration.

The contents of this thesis are divided into four parts. As the original garden city movement fosters the development of residential neighborhoods, Ebenezer Howard's ideas and two experiments of Letchworth and Welwyn have been examined in the first part.

Following the historical analysis of the development and evolution of ideas, seven examples of deliberate planning have been chosen from the United States, Britain, Canada, Sweden, and India. For systematic observation, the examination of each example has been traced in similar pattern including: Concept, Size, Density, Dwelling Units, Schools, Shops, Centre, Open Space, and Articulation. Despite the variation of local considerations and characteristic features, some similarities of planning approach are revealed in various parts of the world.

In Part III, the form of traditional settlement and problems of urbanization in Taiwan have been observed. Since the science of town planning is young in the island and the examples are very rare in this field, the observation of Taiwan is discussed in general.

The opportunity for a good life is essential to the human being. The vital aspect of livability must be created within the human settlement. From Radburn, Harlow, Kitimat, Vallingby, Chandigarh, Reston, to Hook, the explorations of new patterns have emerged. Solutions should be sought not only in terms of physical form but also in the fundamental structure of residential neighborhoods.

PART I

GENERAL PRINCIPLES OF NEIGHBORHOOD

In a period when automatic and irrational forces are driving mankind close to its self-annihilation, the new towns are a victory for the rational, the human, the disciplined, and the purposeful: a proof that sound ideas are not condemned by massive human folly or institutional inertia to remain inoperative.

--- Lewis Mumford ---

THE NEIGHBORHOOD CONCEPT

The Garden City idea began over half a century ago - was it just an utopian' s thought, or had it laid the foundations for new towns in our age? Human beings were neglected and frustrated by industrial operations and mass organizations: it was time to establish the new image of the city for the people.

Earlier utopians had paid some attention to biological and social needs but as a theoretical idea, that did not provide a new form for the mal-functioning city before the end of the nineteenth century.

Ebenezer Howard, who was the first forward-looking observer, reintroduced "the ancient Greek concept of a natural limit to the growth of any organism or organization"[1] into city planning and restored "the human measure to the new image of the city". He drew a schematic diagram of his ideals and principles in terms of the new potentialities of our civilization.

In ' Garden Cities of Tomorrow' , Howard proposed the ' city in a garden' idea and treated the city, country, and region as an integral part of a whole.

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[1] Lewis Mumford, The City in History. P 515

— N°2 —

GARDEN-CITY

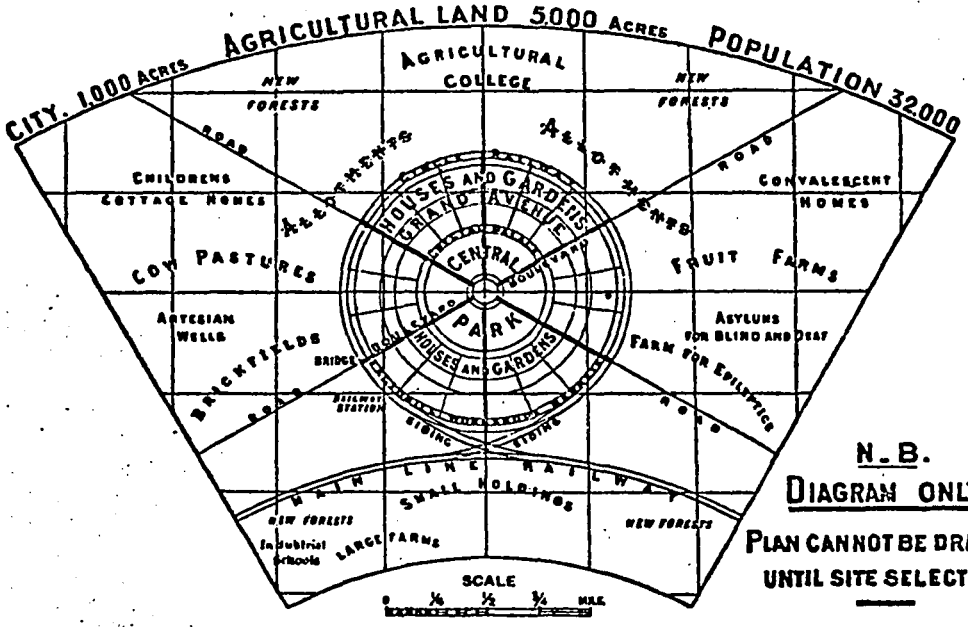

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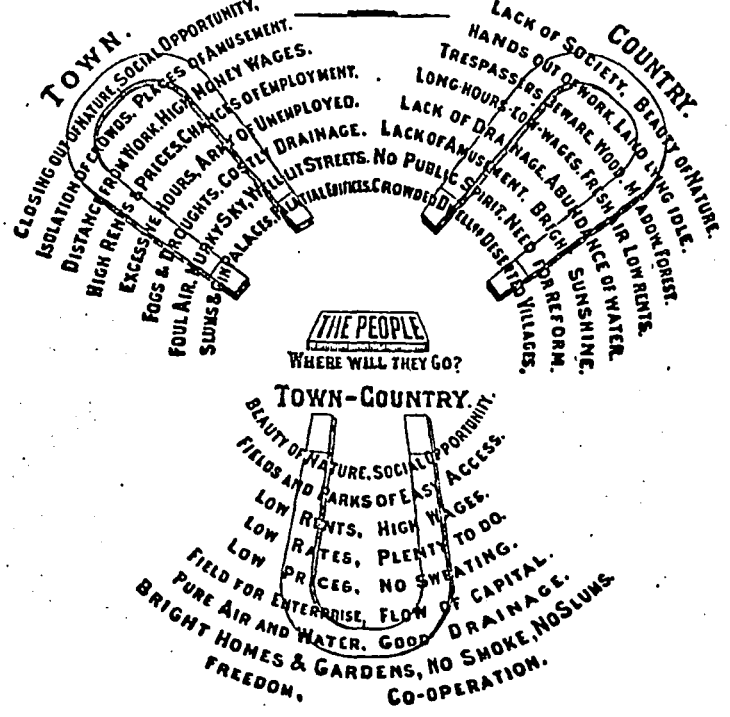
FIG 1
FIG 2

THE THREE MAGNETS.

N° 1.



Concerned with a new form of life, he illustrated the 'three magnets' diagram, such as the town magnet, the country magnet, and the town-country magnet. He asked: Where will people go? He pointed out: "Neither the town magnet nor the country magnet represents the full plan and purpose of nature. Human society and the beauty of nature are meant to be enjoyed together. The two magnets must be made one... The town is the symbol of society --- of mutual help and friendly co-operation, of fatherhood, motherhood, brotherhood, sisterhood, of wide relations between man and man --- of broad, expanding sympathies --- of science, art, culture, religion. And the country! The country is the symbol of God's love and care for man. All that we are and all that we have comes from it."[2]

In combining the advantages of both and the disadvantages of neither, he concluded: "Town and country MUST BE MARRIED, and out of this joyous union will spring a new hope, a new life, a new civilization."[3]

It is a very important turning point in town planning. Howard's plan of Garden City and principle of a city's growth were all derived from this philosophical basis.

[2,3] Ebenezer Howard, Garden Cities of Tomorrow. P 48

In order to achieve a healthy, natural, and economic combination of town and country life, the theoretical plan of Garden City was conceived.

The Garden City is circular and is divided by six boulevards into six equal wards. The core of the city is a 5-1/2 acre circular garden ringed by public buildings such as town hall, principal concert and lecture hall, theatre, library, museum, picture-gallery, and hospital. The circular form of a central park is enclosed by a crystal palace. From the crystal palace toward the outskirts of the town is a residential zone, houses with ample grounds and some with common gardens. The residential zone is divided into two belts by 'Grand Avenue' where the public schools, playgrounds, gardens, and some churches are located. Furthermore, there are factories, warehouses, dairies, markets and timber yards placed on the outer ring of the town.

Howard's proposal was intended to organize a migratory movement of population from congested centres and create self-contained towns in the progress of urban extension. In his mind, a city should not be destroyed by unplanned growth. Therefore, the socially balanced cities were conceived on a sense of regional planning.

Hierarchical system of Howard's Garden City.

Central City	← Core of Ward		Garden	(5-1/2 acres)
		↓		
		↓	Public Buildings	Town Hall Principal concert and lecture hall Theatre Library Museum Picture-gallery Hospital
	Crystal Palace	↓	Public park	(145 acres)
		↓	Houses and garden	

	Grand Avenue	↓	Public School, Playground, Churches	
		----		(420 feet wide)
		↓	Houses and Garden	
	Outer Ring	↓	Warehouses or Factories	
		↑	Agricultural land Natural surroundings	

When the Garden City is built up, how will it grow? Howard said: "The town will grow; but it will grow in accordance with a principle which will result in this --- that such growth shall not lessen or destroy, but ever add to its social opportunities, to its beauty, to its convenience."[4]

What is the principle of a city's growth? He suggested: "It will grow by establishing - under parliamentary powers probably - another city some little distance beyond its own zone of country, so that the new town may have a zone of its own... but the inhabitants of the one could reach the other in a very few minutes; for rapid transit would be specially provided for, and thus the people of the two towns would in reality represent one community". [5]

Following this principle, the geometrical form of social cities came forth. In the diagram of satellite structure, Garden Cities were grouped around a central city and separated by greenbelt and countryside preservation. The concept of Garden Cities is not only formed by its internal hierarchy within the limit, but also interrelated with its surroundings. In other words, the balanced city should widen its base to a balanced region.

[4,5] Ibid. Pp. 140-142.

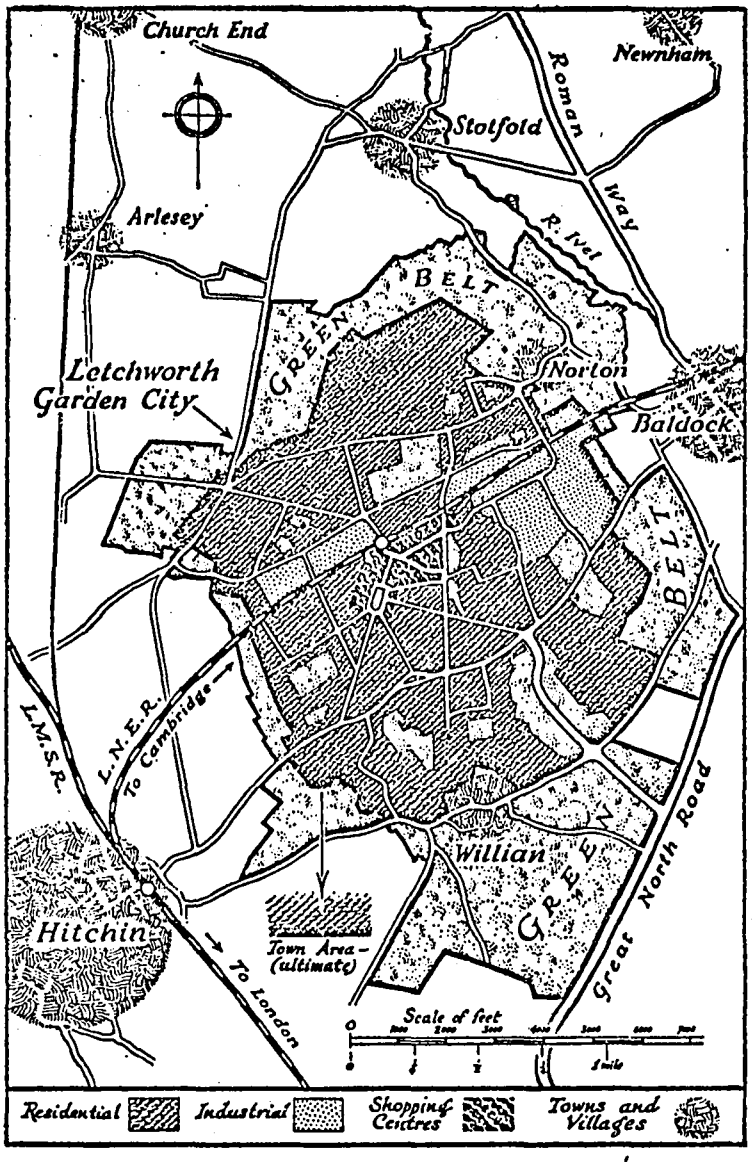


Fig 3. Letchworth Garden City.

For further discussion we have to observe two practical experiments of Howard's theory, Letchworth and Welwyn, because both have profoundly affected the growth of London and the development of new towns in Britain.

Letchworth.

Ebenezer Howard founded a Garden City Association and Journal to persuade prominent persons to carry out his idea. In 1903, Letchworth, the first Garden City, was established. Raymond Unwin and Barry Parker were responsible for the plan. Basically, the plan is a radial form with super blocks. The open layout of the roads and houses preserves some features of the garden in the whole town, but the design of houses is not much superior in aesthetic quality. Following the principle of Garden City, the limit of Letchworth was defined by a rigid green belt.

The scheme was intended to combine private enterprise with the public interest. The first Garden City Ltd. was faced with the problem of money to finance houses, factories or shops, and slowed down the development because the imaginative idea was not regarded by most hard-headed investors as practical.

Unwin's best-known contribution was that "nothing was gained by overcrowding".[6] Letchworth was put forward as an endeavour "to relieve the over-crowding of the towns and to re-populate the countryside".[6]

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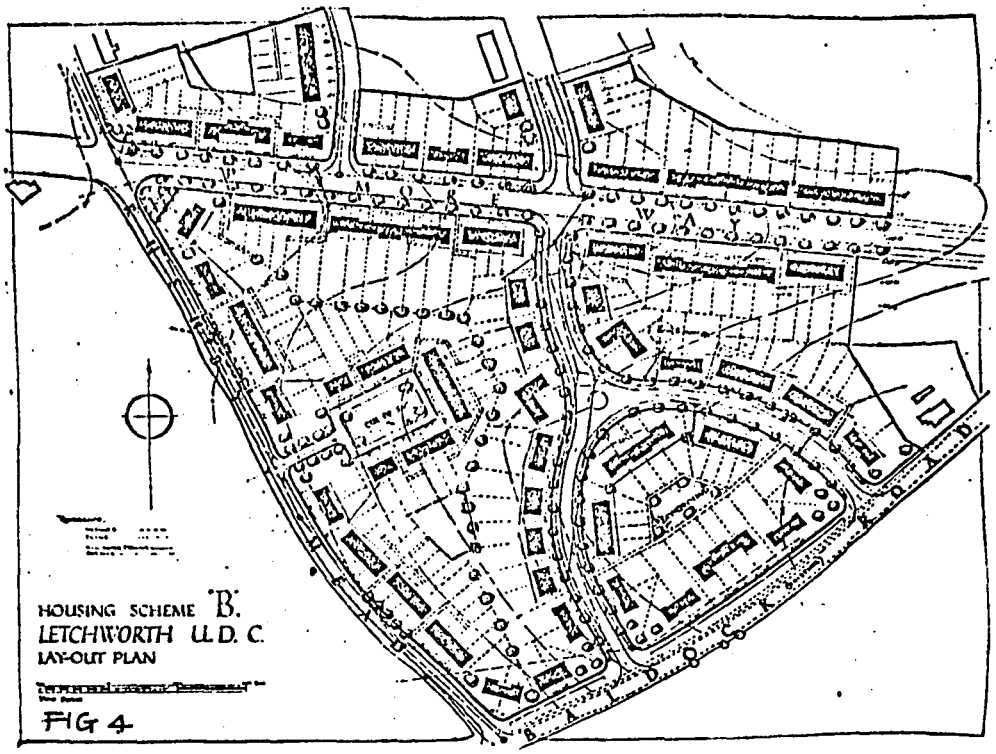
[6] C.B. Purdom. The Building of Satellite Towns. P 52



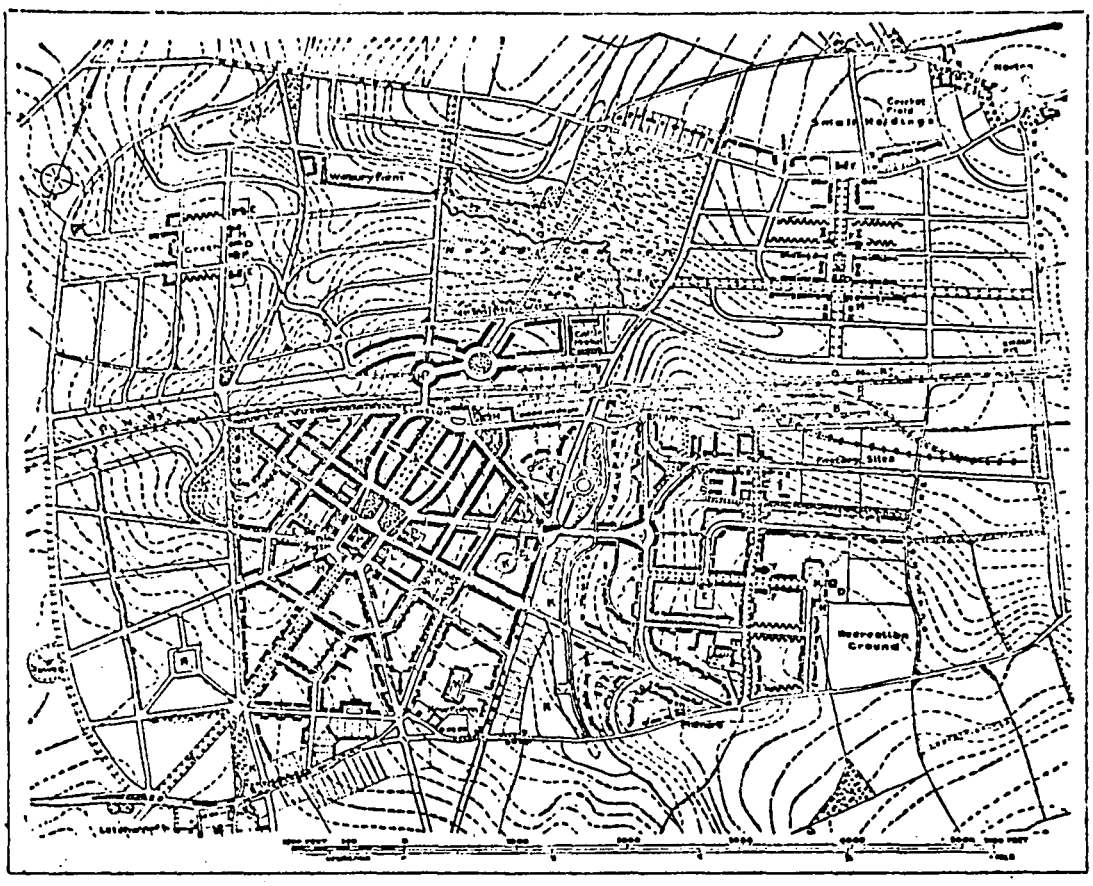


Fig 5. Street Pattern of Letchworth.

Did Letchworth succeed? As F. J. Osborn pointed out: "No one could fairly accuse it of an excess of paternalism or 'do-goodism'. Its achievement was however a notable one. It created a town as healthy as any in the world, a well-serviced town in which every family can live in a house with a good garden within easy distance of walk, the town centre and open country".[7]

Though Letchworth was not the 'archetypal' town in a planning sense, it planted the seed for future new towns. At least there were several principles that had been tested at Letchworth, such as the pre-planning scheme for the whole area, the quasi-public ownership of the site with respect to the increase in land values, the closer relation between urban and rural activities, as well as overall control of housing densities.

Welwyn.

Welwyn, the second Garden City, was founded in 1920. Like Letchworth, the town was planned on an open stretch of land and surrounded by a green belt. The site is located at the strategic point of railway and highway, and takes a circular form.

There were several objectives of Welwyn Garden City Ltd.:

1. Provision for the needs of a population of 40,000 to 50,000.

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[7] F. J. Osborn, A. Whittick. The New Towns. P 43

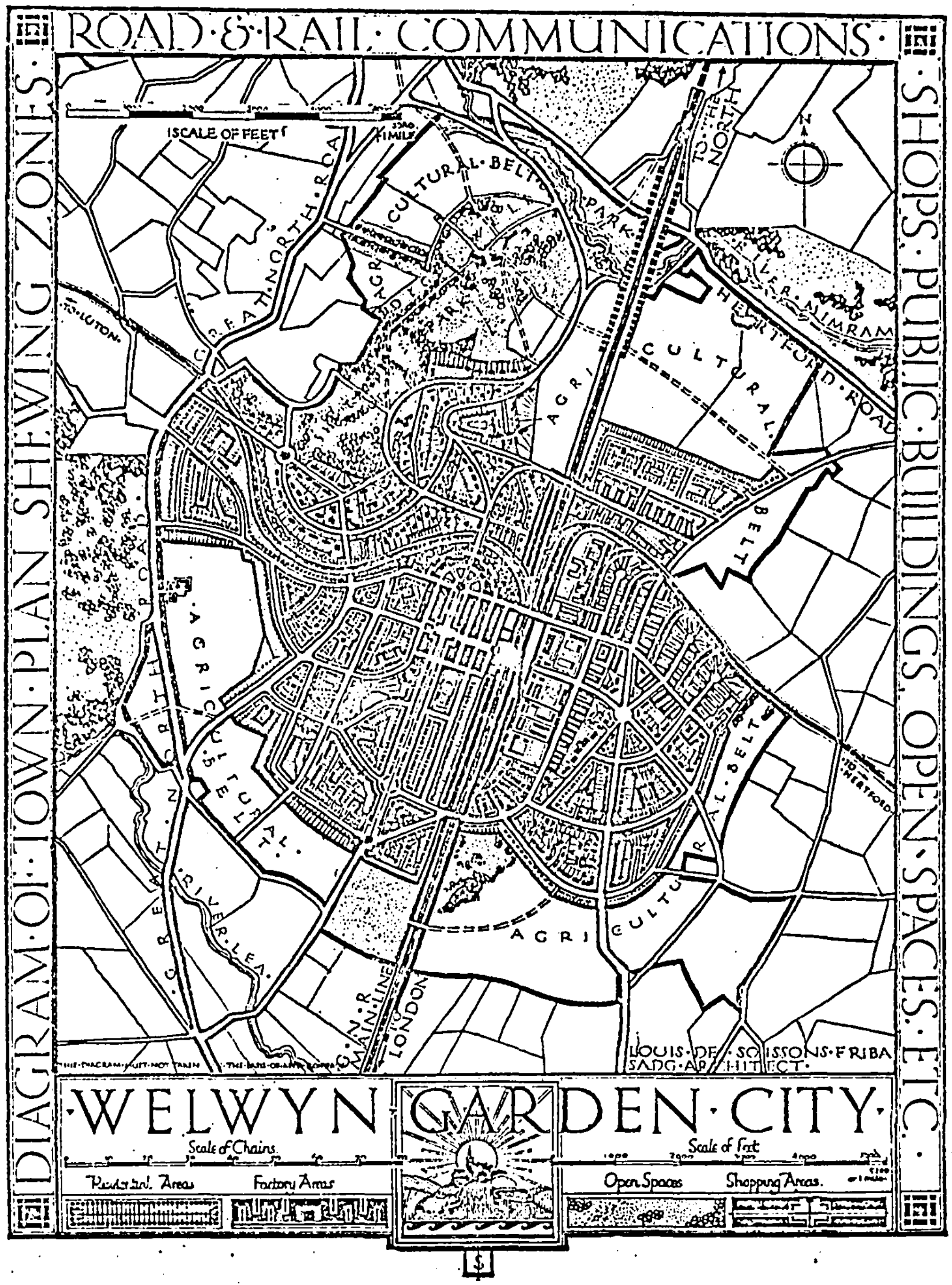
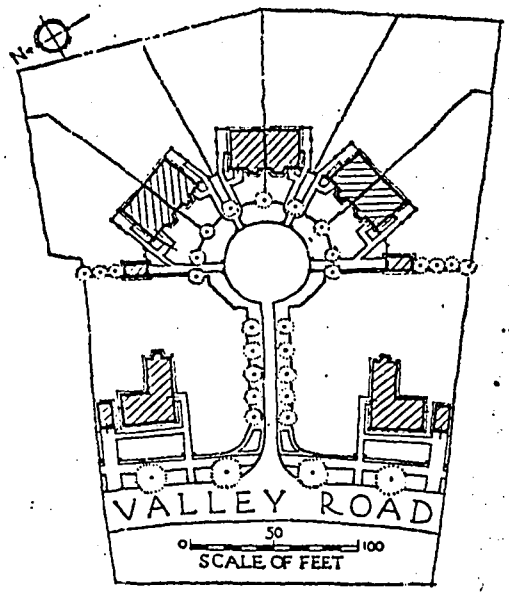

ROAD·&·RAIL·COMMUNICATIONS·
DIAGRAM·OF·TOWN·PLAN·SHEWING·ZONES·
·SHOPS·PUBLIC·BUILDINGS·OPEN·SPACES·ETC·
SCALE OF FEET
GREAT·NORTH·ROAD
AGRICULTURAL·BELT
PARK
TO·THE·NORTH
HERTFORD·ROAD
RIVER·MIMRAM
TO LUTON
BELT
G.N.R. MAIN·LINE
LONDON
RIVER·LEA
TO HERTFORD
LOUIS·DE·SOISSONS·F·RIBA
SADG·ARCHITECT·
·WELWYN·GARDEN·CITY·
Scale of Chains
Scale of Feet
Residential Areas
Factory Areas
Open Spaces
Shopping Areas.

FIG 6

2. Instead of garden suburbs, creation of a self-contained industrial-garden city for the people working in an adjoining district.
3. Anticipation of all the social recreational and civic needs required to preserve the amenities and health of the town.
4. The maximum density of houses would be twelve to the acre, the average not more than five to the acre.
5. Company organized on the basis of the original shareholders receiving dividends of not more than 7 per cent per annum (cumulative).

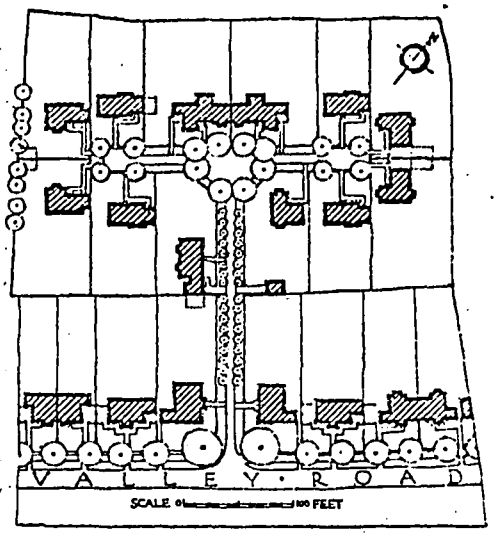
In order to meet the demand for a good residential neighborhood, the town comprised a mixture of classes in the social organization, with the people in all parts of the town sharing a sense of common interest and life.

The extensive use of the residential 'cul-de-sac' or short 'close' is a remarkable feature of Welwyn Plan. The clustering of houses creates larger open spaces, privacy, and quietness. It also provides a minimum frontage of main road and economy of sewers. The location of factories and shops was deliberately planned so inhabitants could enjoy order and a decent life as well as eliminate excessive commuting distances.



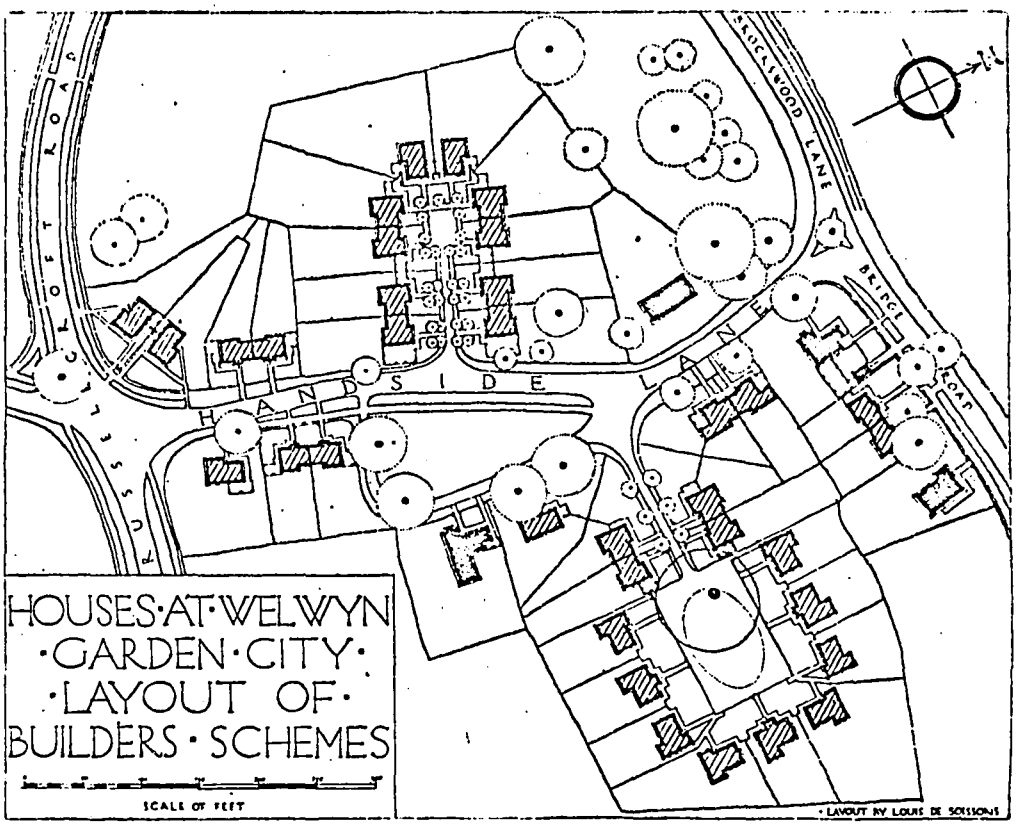
A SMALL CUL-DE-SAC WITH AN OPEN EFFECT

FIG 7



A T-SHAPED CUL-DE-SAC ON LAND HIGHER THAN THE ROAD IN WHICH A CERTAIN PICTURESQUE EFFECT IS AIMED AT

FIG 8



In the development of the Welwyn plan there were some planning principles revealed such as the unified control of building and site, the effect of removing factories from London, the policy of land reform, and the growth of an active civic sense among the inhabitants within the town.

What has been achieved in the course of two model Garden Cities? Despite some obstacles and errors, the two experimental garden cities had many factors in common. They were located in the same county and operated on the basis of Howard's idea. Unfortunately, there was little cooperation between the two enterprises because of economic competition.

Letchworth and Welwyn both located in the London region. Obviously, Howard proposed them as two satellite towns of the central city - London - to show that his 'Social Cities' theory would be a guidance of metropolitan growth instead of the urban sprawl of the nineteenth century.

Whatever judgment we may make, the experiment of two towns has proved some general ideas for the world to see.

As Lloyd Rodwin said: "In the process of development, the towns also pioneered some significant planning innovations, including use and density zoning, a form of ward or NEIGHBORHOOD planning, employment of an agricultural greenbelt to control urban

size, and unified urban land ownership for the purpose of capturing rising land values for the benefit of the residents. A body of experience was also accumulated which gave some inkling of the difficulties ahead and some of the necessary conditions for execution of any larger program."[8]

There are several points of Garden City concept which may be summarized as follows:

1. The size of the town to be limited, and growth by 'colonization'.
2. The town to be surrounded by an agricultural belt.
3. The town to be built to provide a better environment for healthy living, with houses for all classes of the community.
4. Functional provisions to be made to prevent over-crowding.
5. An entire town to be built with sufficient opportunities and variety of social services.
6. 'Control of the land in the public interest'.
7. Following similar principles, other towns defined by agricultural belts to be built and related to each other, as organic units to the growth of the whole region.

Howard's principle has been criticised for being too specific and allowing short shrift to other alternatives.

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[8] Lloyd Rodwin. The British New Town Policy. P 15

Lloyd Rodwin said: "Howard misjudged the advantages, strength, and momentum of existing cities, trends in population growth, the strategy of urban location, the positive benefits of the journey to work, the problems of financing and of metropolitan organization". [9]

Lewis Mumford also commented: "But the fact is that in the first generation of its existence, Howard's impractical proposals succeeded in bringing about the establishment of two Garden Cities - Letchworth and Welwyn; and both of these communities, starting as private enterprises, with limited prospects of gain, not merely survived indifference and opposition, but have affected the pattern of housing and city-building in many areas, from Scotland to India". [10]

A new town is not simply an exercise of principles: it is the creation of a living community for people. It seems that Howard had foreseen some difficulties in his scheme. He said: "It is quite true that the pathway of experiment towards a better state of society is strewn with failures. But so is the pathway of experiment to any result that is worth achieving. Success is, for the most part, built or failure". [11]

9, 10, 11 Ibid p. 36, p. 522, p. 112

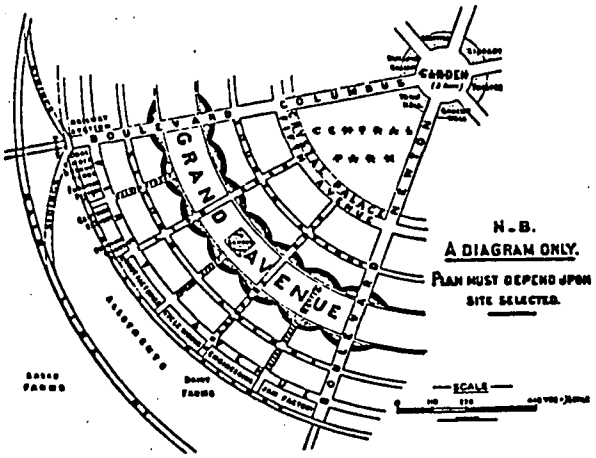

FIG 9 WARD AND CENTRE OF GARDEN CITY

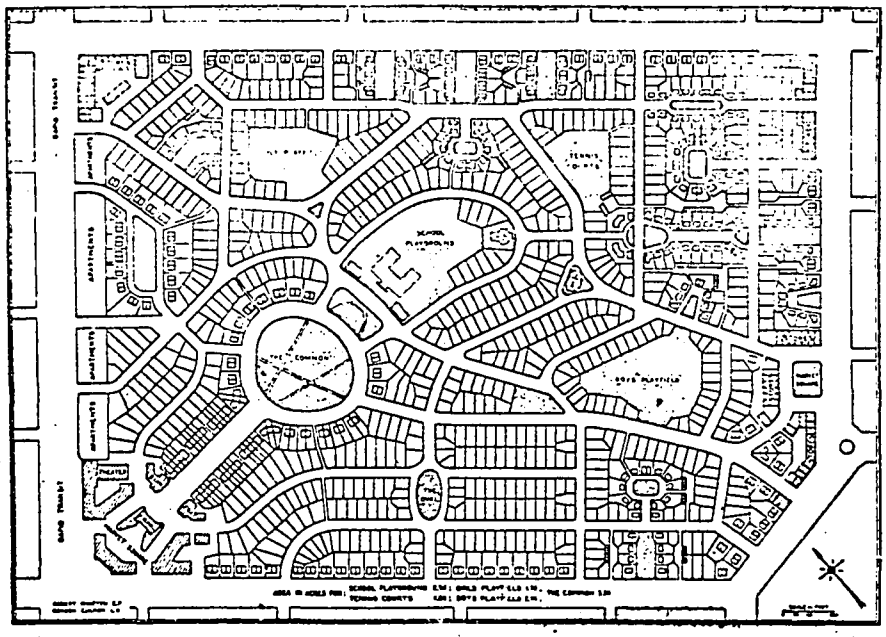

Fig 10. Perry's Neighborhood Unit.

Perry's Unit.

After the Garden City movement, the full statement of the 'Neighborhood Unit' was originated by Clarence Perry. He took the fact of a New York suburb and showed how value could be derived from a deliberately planned neighborhood.

"Perry sought to determine what facilities and institutions were necessary for domestic life as such; how many people were needed to support an elementary school, a shopping centre, a church, or other institutions; and by what re-arrangement of the street pattern a coherent neighborhood could be created with every necessary local function within walking distance of the dwelling".[12]

There are six basic principles in Perry's theory:

(1) Size - about 5,000 people within a quarter mile walking distance from the school.

(2) Boundaries - limited by four arterial streets.

(3) Open space - ten per cent of the area for recreation and park space.

(4) Institution sites - to be placed at the centre.

(5) Local shops - periphery at traffic junctions.

(6) Internal road system - giving easy access to shops and community centre.

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[12] Lewis Mumford. "The Neighborhood and the Neighborhood Unit." Town Planning Review. Jan. 1954. P 262.

Perry's concept of the neighborhood unit was called 'the modern equivalent of medieval quarter or parish'. His plan intended to restore the spirit of village life in the past, and to further the face-to-face acquaintances with respect to social contacts.

His statement has been described thus: "In planning, the result of this was to change the basic unit of planning from the city-block or the avenue, to the more complex unit of the neighborhood, a change that demanded a re-apportionment of space for avenues and access streets, for public buildings and open areas and domestic dwellings: in short, a new generalized urban pattern".[13]

The concept of "Neighborhood" had formulated as an ingredient in planning a town. The development of this ingredient is to be traced in Kitimat, Vallingby, Chandigarh and British New Towns as well as some other parts of the world.

The concept of neighborhood planning has been generally accepted. Although it has long been contended, it does not mean that social units are out of date a concept in the auto era. The importance is that we have to create a better environment for people. As far as the 'human scale' is concerned, it is the basic

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[13] Ibid. Town Planning Review. Jan.1954 P 262.

foundation to develop. But the idea is applicable with modification to the conditions of place and time.

The form of residential neighborhoods has to prepare for the future. It must be of dynamic growth to keep up with the changing phases in our way of living and thinking.

To examine the towns mentioned in a systematic way the following matters need to be considered:

OPTIMUM SIZE AND DENSITY

ELEMENTS OF NEIGHBORHOOD:

- Dwelling Units
- Schools
- Shops
- Centre
- Open Space

ARTICULATION OF NEIGHBORHOODS

OPTIMUM SIZE AND DENSITY

Neighborhoods are composed of people in a common life. The optimum size and density are one of the substantive principles in the neighborhood planning.

In Perry' s Unit, the population was based on 5,000 persons to support an elementary school with an enrolment of between 1,000 and 1,200 pupils. What is the desirable size for the residential neighborhood? L. Keeble suggested: "It seems, however, fairly clear that it can most appropriately contain a population of about 5,000 or about 10,000. The smaller can support one two-stream primary school, the latter can support two. Below about 5,000 the unit is too small for flexibility and must lack substance; above about 10,000 it becomes too large for its identity to be appreciated and begins to suffer from the ' sea of houses' symptoms of inter-war housing".[1]

The size of neighborhood is affected not only by walking distance, topography and means of getting to and from communal facilities or a centre, but also by the surrounding settlements, and on social and economic conditions at the time.

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[1] Lewis Keeble. Principles and Practice of Town and Country Planning. P 162

The population size and density are crucial elements of the human settlements for planning pre-determination and control. These two factors have "significant impact on the achievement of major aspects of the good life".

In considering the relationship of population and density, it is hard to define the optimum population simply based on the radius of walking distance from the centre. As F.J. Osborn stated: "Once it is realized that a town can be too big, the question arises as to what is the best or optimum size for a satisfactory town, taking into account the requirements of modern industry and commerce, residential standards, access between home and work, and facilities for recreation, entertainment and culture. There is no universal answer".[2]

There is a dilemma between the overall controls and flexibility of arrangements and growth, but it is relevant to say that a desirable size is based on a function of time and place. In other words, the proper size must be able to provide communal facilities which bring people together and to engender a sense of belonging to a particular country and at a particular date.

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[2] Ibid. P 11

ELEMENTS OF NEIGHBORHOOD

The pattern of the neighborhood unit is not only formed by dwellings, it is also based on comprehensive planning to fulfil the needs of families and the needs of all age groups in population. In organizing the form of human association, there are five elements for the functional provision of neighborhood units as integrated parts of the whole.

Dwelling Units.

To avoid monotony or chaos in the arrangement of dwelling units, the order of the housing groups must be woven within the neighborhoods. Between the homogeneity and heterogeneity, S. Giedion stressed on the balanced community with diversified units in terms of social cohesion. He said: "It is a long-drawn-out and difficult process. Massive agglomerations of high-rise buildings offer no more of a solution than the endless sprawl of single family dwellings and row houses. The starting point must be the diversified residential unit. This can provide differentiated dwellings for our ever more complicated social structure: dwellings that take account of the existence of single men and women and that allow for the normal changes of family life -- the young married couple, the period of growing children, the later shrinking of the family circle, and the

period of old age. These needs cannot be met by an endless series of similar cells, whether arranged horizontally or vertically. Right from the start the social needs of the different age groups must be taken into consideration, not merely the requirements of small children but also those of young people and adults."[1]

Since the neighborhood is essentially a spontaneous social grouping, all types of dwellings are required to meet the needs of family life at every stage of growth. Fortunately, the gap between planners and sociologists has been noticed by both sides. Hook is an example which attempted to fill this gap.

Schools.

Educational systems, in many areas, are rearranged into three groups:

Elementary school (Grades 1 to 6)

Junior High School (Grades 6, 8, 9) and

Senior High School (Grades 10, 11, 12 and 13)

In considering the spatial context of educational systems, the provision of schools has to fit the length of the educational process within the pattern of residential neighborhood.

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[1] S. Giedion. Architecture - You and Me. P 160

Due to the existence of education based on both family and school life, it is important to locate a school site within easy reach of home for small children.

Apart from establishing the focal point, there are questions we have to deal with. What is the desirable walking distance between home and school? Where is the proper setting for various school types?

It seems that elementary schools should be within ten minutes walk but high schools are likely to be placed in the main centre along with the other social institutions for young students from surrounding neighborhoods in order to tie the community together.

Shops.

The siting of shops is determined by accessibility. In Perry's Plan, shops should be located at the main traffic junctions on the outside corners of the neighborhood unit.

The recent trends of modern retailing are transformed from the corner store into the shopping centre. Instead of the congested commercial streets of conventional business, there is a huge building amidst a sea of cars. As Humphrey Carver pointed out: "No satisfactory modern version of the corner store has yet appeared.

Yet every new neighborhood needs the kind of small shop that can be reached on foot and where the children can be sent on bicycle errands".[2]

Obviously, shops may form larger groups and be combined with other communal buildings to make a centre. Since shopping activity is essentially a pedestrian one, the multi-level deck with vertical segregation seems to be a reasonable answer. Nevertheless, the various types of shop should be considered in the context of the particular area or country; for instance, the nature of 'bazaars' in the Indian village.

Centre.

In the town centre, open squares and public buildings are assembled together to express the life of the community. It is a core of residential neighborhood where the sense of urbanity is created. The public interest, social institutions, and community facilities are tied together. The main centre performs various functions and comprises three groups:

(1) Commercial centre - shops, market, restaurants, bank.

(2) Cultural and entertainment centre - town hall, public libraries, theatre, art galleries.

(3) Civic headquarters - offices, health clinics.

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[2] Humphrey Carver. Cities in the Suburbs. P 81

No social organization is wholly self-sufficient; the modes of activities vary with the size of units, from the domestic sub centre and neighborhood centre to the main centre. They may have some overlapping functions but the centre of concentralized facilities not only creates a focus of the common life but also affords the daily service.

As far as the needs of the inhabitants are concerned, people may go to the big department store or downtown in the city for the luxury item. It does not lessen the importance of neighborhood functions and the spirit of community life.

However, the problem between man, cars and spatial order has to be observed. Above all, what kind of new form can lead these factors to fit into the dynamic process?

Open Space.

The trend of modern technology is to rely on machines instead of manpower. Due to the changing pattern of the labor systems, working hours have been reduced decade by decade, from a 6-day week to a 40-hour week. In other words, the nature of modern production makes more leisure time available. Therefore relaxation and recreation have become more important than in the handicraft age.

Open space is considered an active recreational area for children, youth and adults as well as the passive relaxational area for adults.

Within amenity greens, open space may provide a variety of recreational activities such as baseball, football, a swimming pool, a bandshell, a stadium and recreation building. It may form part of a park as a vital element of community living.

From the visual and access point of view, there are some questions that require answers. How is the introduction of open space to be reflected amidst the contrast and variety of buildings and landscapes? Should it be continuous, or distributed within and around a neighborhood?

Apart from the reason to preserve some interesting topographical features, the landscape pattern would be irregular and the dwelling groups would be compact in design. The relation between internal recreation spaces and external stretch of natural features should be carefully arranged.

ARTICULATION OF NEIGHBORHOODS

The articulation of neighborhoods is to give the area its own spatial identity in terms of functions. It also divides and adjoins each part in association with its own character to form the structure of neighborhoods.

The phenomenon of urban sprawl is expressed by isolated or scattered housing projects for small tracts strung out along existing highways in rural areas. It is a waste of land and is unsuitable as a pattern of urban environment.

The systematic articulation is not only a means to define the housing groups in the heart of the neighborhood, it also forms a spine to integrate each part of the dwellings.

Man is soft and spontaneous, while the car is hard and follows a predetermined line. In examining the relationship between a human settlement pattern and a vehicular pattern, this is one problem that we have to face: how is the dilemma between traffic communication and pedestrian inter-connection to be solved within the neighborhoods?

In the Garden Cities, the characteristic circulation system consists of radials and ring roads. The function of radials is to connect the traffic between neighborhoods and centre. In the meantime, ring roads distribute traffic movement to surrounding areas but if the focus of activity shifts, this congested traffic system becomes unwieldy.

In more recent years the tendency is to develop spine-and-rib system with a basic linear form. Considering the problem between vehicles and pedestrians, vertical separation is introduced in terms of decks or levels.

In the hierarchical system of neighborhoods there should be a simple movement of goods or people, there should be created a human settlement based on the human scale.

PART II

OBSERVATION OF EXAMPLES

RADBURN

CONCEPT:

In 1923, Clarence Stein visited England to study the principles of Welwyn, Letchworth, and Hampstead Garden Suburb. He returned to the United States a devout disciple of Ebenezer Howard and Raymond Unwin.

The Radburn idea was conceived by Clarence Stein and Henry Wright in 1928. The original aim was to design a garden city inspired by the Howard idea. Realization of city living must take account of the new phenomenon of the motor age; two principles of garden city - green belt and industry - were eliminated to a certain extent.

Five elements of the Radburn plan which attempted to answer the enigma "How to live with the auto" are as follows:

1. The superblock, in place of the characteristic narrow, rectangular block.
2. Specialized roads planned and built for one use instead of for all uses, differentiating between movement, collection, service, parking and visiting.
3. Complete separation of pedestrian and automobile; for this purpose overpasses and underpasses were used.
4. Houses turned around.
5. The park as the backbone of the neighborhood.[1]

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[1] Clarence Stein, Toward New Towns for America. The MIT Press, 1966. Pp. 41-44

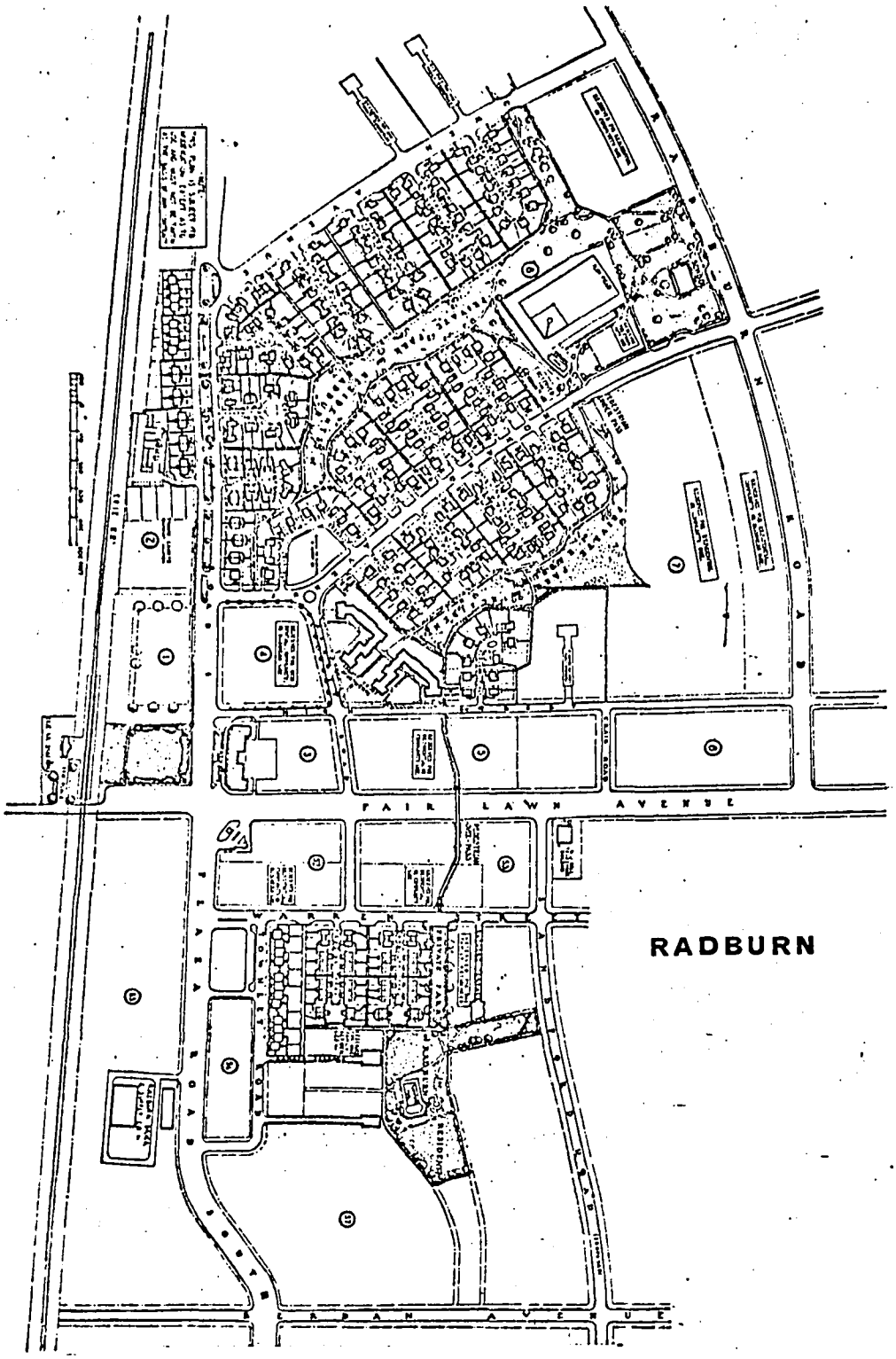

Fig 11. Plan of Radburn.

The Radburn idea sprang from detailed consideration of living environment in the auto era, it has compiled a scale of livability for home owners who seek quiet surroundings in which to live.

To follow Aristotle's recommendation that "a city should be built to give its inhabitants security and happiness", Radburn demonstrated a new form to fit the needs of American urban living. The concept of Radburn emerged as a complete neighborhood unit, a more sophisticated approach than Perry's Plan. The inner core of the town was formed by the pedestrian's movement along a spinal green. The elementary school closely followed Perry's idea and was located at the centre of each neighborhood within half a mile walking distance of all homes. Moreover, each neighborhood unit was to have its own shopping centre.

SIZE AND DENSITY:

The neighborhoods were planned to accommodate 7,500 to 10,000 people. Size was determined by the desirable number of children in a single school. The main collector roads enclosed superblocks ranging from 30 to 50 acres. Within them, single-family dwellings were grouped around cul-de-sacs. The density was fairly low, about 21 persons per acre.

Of the early residents who moved into the town with children of pre-school age (approximately 400 families during the first few years) 70 per cent of the men commuted to New York city to work.

As a result of the Wall Street market collapse in 1929, the Radburn plan, the first complete new town for 25,000 people, was abandoned.[2]

ELEMENTS:

Dwelling Units

The Radburn pattern was made up of low-density houses. Except for some cheaper houses formed by attaching two or three units together, most of the dwellings were single-family houses with double access. One access led from the pedestrian path to the inner park, and the other access from the service lane. Clarence Stein described this as "living and sleeping rooms facing toward gardens and parks: service rooms toward access roads".

The remarkable achievement of the Radburn layout was the separation of a vehicular zone from a park zone. It has been modified and applied all over the world.

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2 Ibid. P 69

Schools

The general community plan of Radburn was prepared to provide three elementary schools, and one combined junior/senior high school as the centre of the educational, cultural, as well as recreational life of the town.[3]

Shops

Centre

Shops and commercial districts were located at the main traffic junctions in front of the Erie railway station. Because of the depression the Centre was not constructed. However, the plan stressed recreational aspects more than shopping centres.

Open Space

"Large open areas in the centre of superblocks, joined together as a continuous park". The central greens were designed to be recreation places where playgrounds and swimming pools would be provided. The community life in Radburn is promoted by a Citizens' Association to maintain the necessary community services, parks and recreation facilities. There are two recreational centres

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[3] Ibid.

in Radburn, one in the north and the other at the opposite side of Fairlawn Avenue; each has its swimming pool and playground forming part of the inner park. Both are connected by overpass and underpass pedestrian pathways.

Serge Chermayeff and Christopher Alexander have commented on the Radburn 'green backbone' thus: "The generous provision of communal park space raises new problems of ownership and responsibility".[4]

ARTICULATION:

Central Park in New York was planned by Frederick Law Olmsted and Calvert Vaux a century ago,which was about half a century before the invention of the automobile. I would like to point out what kind of traffic system they conceived in 1851: ".... a system of independent ways; 1st, for carriages; 2nd, for horsemen...; 3rd, for footmen; and 4th, for common street traffic requiring to cross the park. By this means it was made possible ...to go on foot to any district of the park...without crossing a line of wheels on the same level..."[5]

It seems that Stein devised his plan from the Olmsted idea to meet the new needs of the automobile era. To abandon the traditional gridiron pattern the system of circulation was devised

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[4] Serge Chermayeff, Christopher Alexander. Community and Privacy. P 187

[5] F.L. Olmsted. Forty-eight years of Architecture.

as follows:

1. Service lanes (cul-de-sac) - for direct access to buildings.
2. Secondary collector roads around the superblock.
3. Main through roads - linking the traffic of various sections, neighborhoods and districts.
4. Express highways or parkways - for connection with outside communities. [6]

Two solutions were proposed to separate pedestrian paths from vehicular traffic. One used the inner park instead of the auto road, the other employed the underpass and overpass at crossing points to link the two major parks and playgrounds together.

As Clarence Stein mentioned in his famous book 'Toward New Towns for Americans': "Radburn did not become a garden city. It lacked a complete green belt. It did not succeed in securing industry. Its underlying land, excepting the inner block parks, was not retained in single ownership for or by the community".

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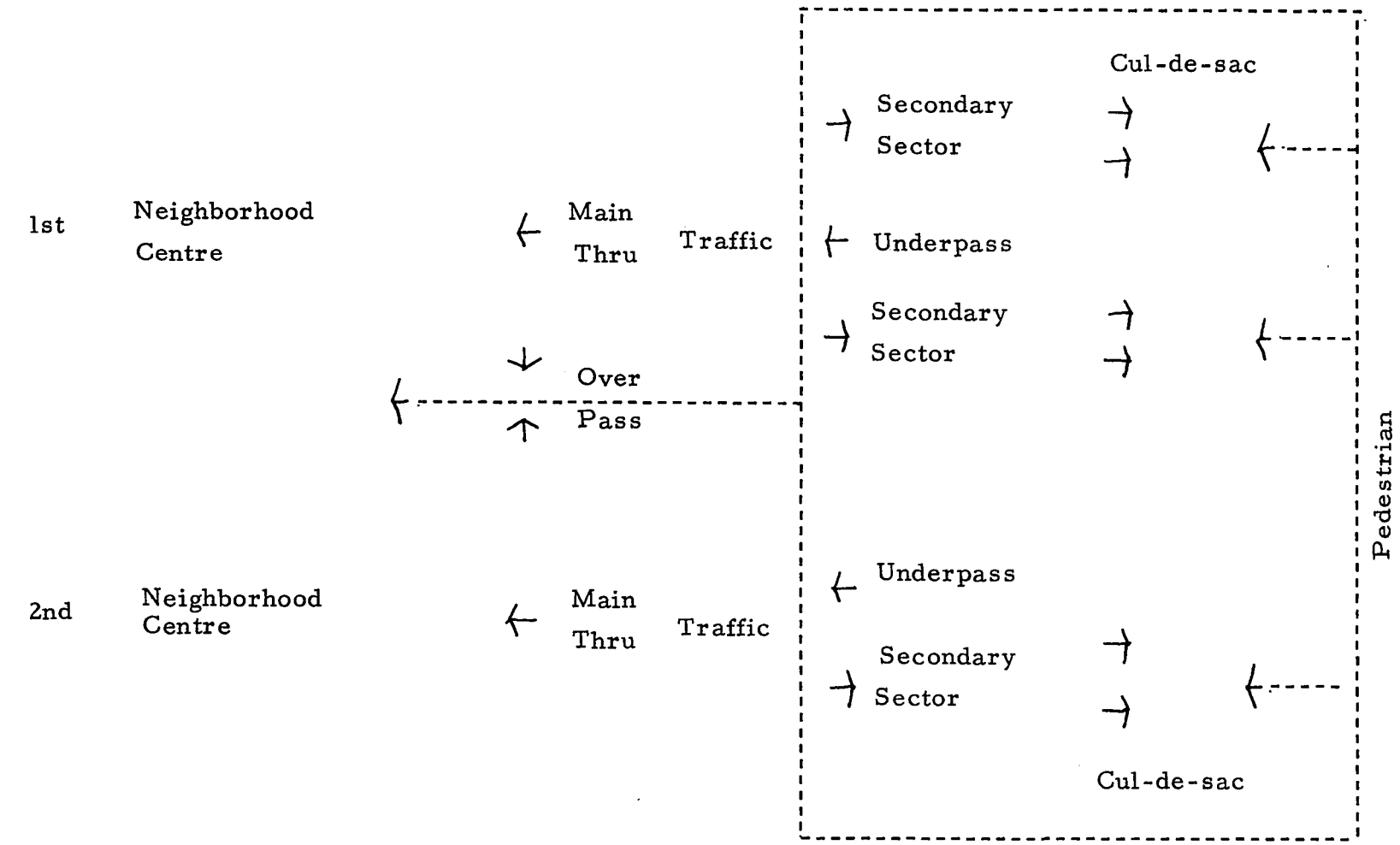
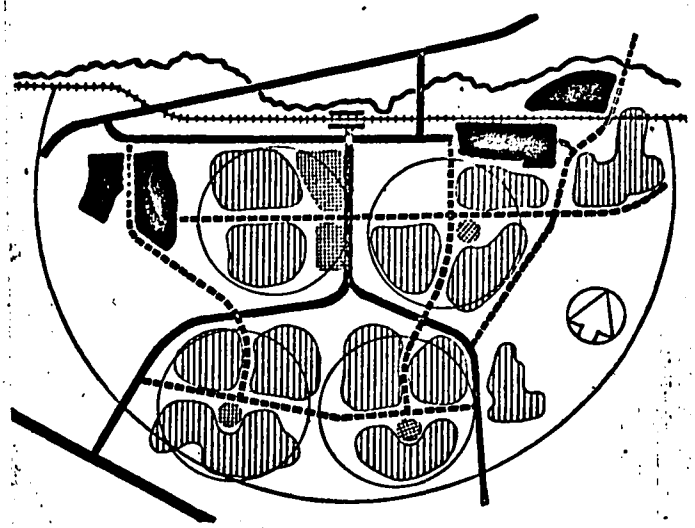
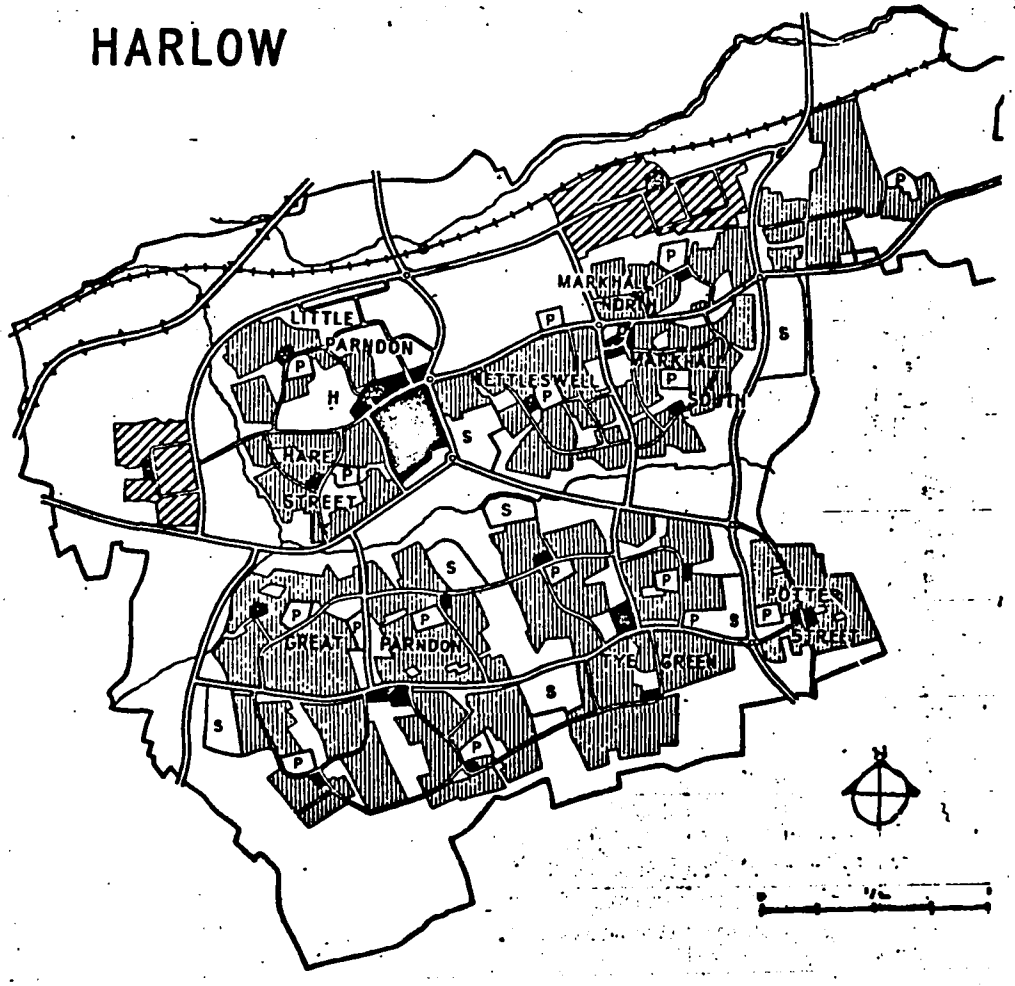
[6] Ibid. P 41


Cul-de-sac
Secondary
Sector
1st
Neighborhood
Centre
Main
Thru
Traffic
Underpass
Secondary
Sector
Over
Pass
Pedestrian
Underpass
2nd
Neighborhood
Centre
Main
Thru
Traffic
Secondary
Sector
Cul-de-sac



HARLOW



RESIDENTIAL
INDUSTRY
TOWN CENTRE
NEIGHBOURHOOD CENTRES AND SUB-CENTRES
OPEN SPACE AND AGRICULTURAL LAND
MAJOR ROADS
RAILWAYS
SCHOOLS
P PRIMARY
S SECONDARY
H HOSPITALS

FIG 12

HARLOW

CONCEPT:

Harlow is planned as a self-contained town and not as a satellite to take surplus population from north-east London. Therefore the neighborhoods consist of houses, working places, and social facilities.

The plan of Harlow is designed as 13 comparatively compact neighborhood units ranging from 3,500 to 6,000 people. Each unit has its own primary school and sub-centre. Since the natural features such as woods and valleys act as barriers between them, the residential areas are arranged into four neighborhood clusters, three of which are grouped around their own centre, with the fourth focusing on the town centre. The Architectural Review called it "the urban landscape within the town's walls and the natural landscape outside them".[1]

In Howard's Garden Cities, the growth of town is to be limited and defined by an agricultural ring, and the principle is retained in Harlow. Frederick Gibberd let the agricultural ring extend into the town as urban parks and recreation areas. It is linked to the agricultural wedges and forms a fixed landscape pattern.

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[1] Architectural Review. March 1948. P 85

The modification of Howard' s principle is an attempt to weld the contrast between building and landscape into an aesthetic whole.

There has been much criticism of Harlow' s broad valley "that the town is too much of a sprawl with a lack of general compactness". Gibberd explained that "this broad flow of landscape in between the groups of buildings gives people a chance to drive and walk about the town in natural surroundings; it stops the town closing up into one vast mass of buildings and it gives a fine contrast between the work of man and the work of God". [2]

In the plan of Mark Hall North, Frederick Gibberd attempted to organize the social structure of the neighborhood cluster. The grouping of the three neighborhoods with seventeen thousand people contains a main centre which interrelates with each sub-centre as well as with various elements of the neighborhood.

SIZE AND DENSITY:

The site of Harlow is about thirty miles from London and lies to the south of the River Stort. The coverage of the town site is about 6,320 acres planned to accommodate 60,000 people. Because of the compact planning for social and aesthetic reasons, the maximum population has been increased to 80,000 by a higher net housing density of 50 persons an acre, with 20 per cent of flats, but the plan

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[2] F.J. Osborn. New Towns - The Answer to Megalopolis McGraw-Hill 1963. P 199

still retains its original structure.

The two industrial areas were planned to accommodate 14,400 workers, the land coverage of industrial buildings is 565 acres. To provide a safe factor for industry, the density is a little lower than residential areas at a gross of 25.5 persons per acre.

ELEMENTS:

Dwelling Units

The layout of mixed housing development was designed to fit the needs of various families. In the Mark Hall neighborhood the housing is classified into two main groups: Standard I - for the lower and middle income groups, and Standard II - for the higher income group. The grades are not arbitrary and the design is varied within the Standard I category to provide a wider range of rents and choice of dwelling. Dwelling sizes vary from bed-sitting room flats in tall buildings to detached five bedroom dwellings. The Standard II houses are generally sited on the edge of the area or on irregular land where gardens of different shapes and sizes can be provided.[3]

In the first three housing areas built in Mark Hall North, the density has been increased from forty persons to sixty persons per acre in order to achieve greater urbanity.

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[3] Harlow New Town. Architectural Review May 1955. P 315

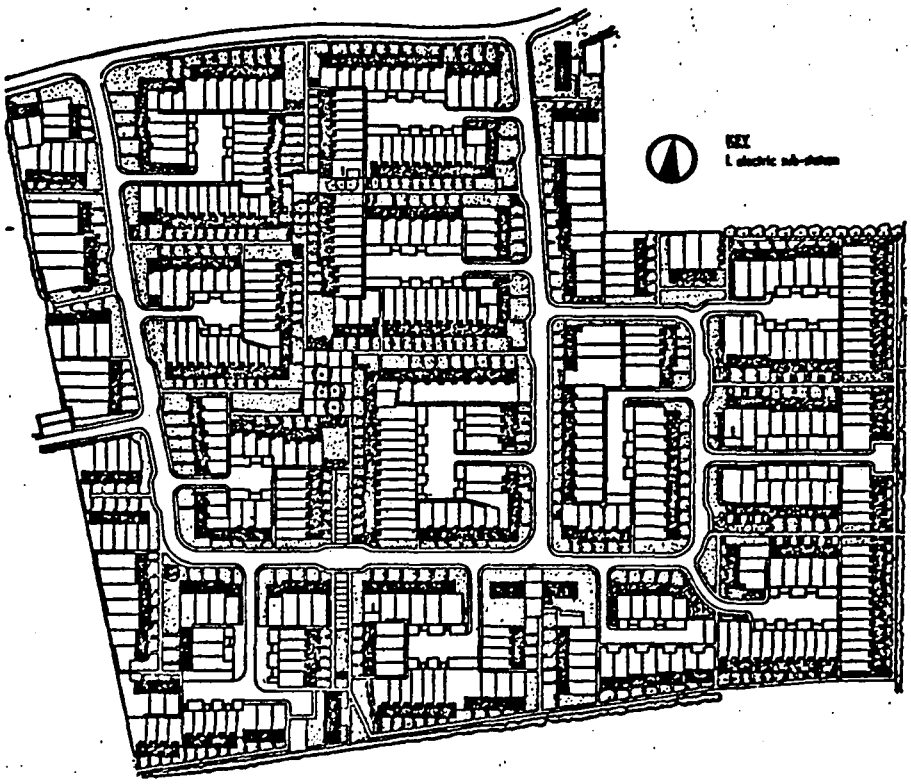
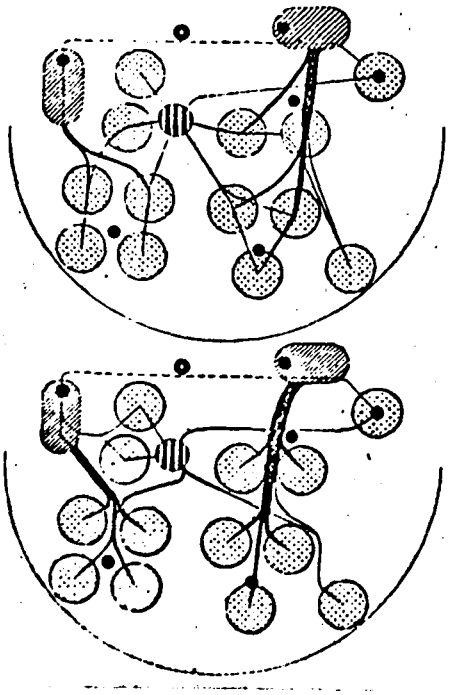


FIG13 FIG14. —Harlow—residential area in which culs-de-sac are at the rear of houses with garages, with footpaths between the fronts of houses—an adaptation of the Radburn system.



FAST TRAFFIC
SLOW TRAFFIC

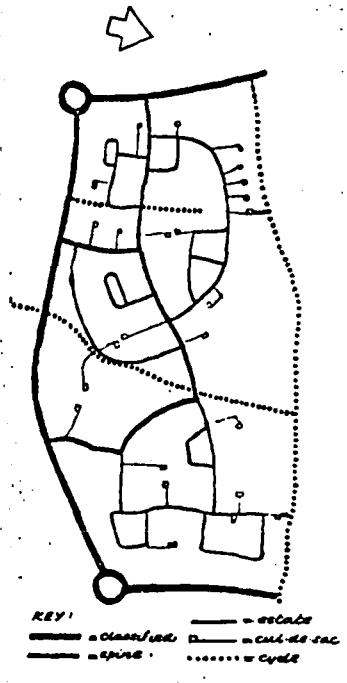


FIG15 MARK HALL NORTH, ROAD PATTEN

There are stages of community grouping; the housing group with its play space; the neighborhood with its primary school, minor shopping centre, hall and pub; and the neighborhood cluster in which communal facilities are provided on a large scale.[4]

Schools

The primary school is located in the heart of each neighborhood and adjoins the local shops, public hall and recreation area to provide a visual focus. It is also placed within easy reach of school children.

The secondary schools are sited in the parks between the neighborhood clusters and these serve the town as a whole.

There are fifteen primary schools, seven secondary schools, and one country college in Frederick Gibberd's original plan.

Shops

The classic principle of neighborhood size is prescribed by an easy walking distance of a quarter of a mile, or ten minutes walk. Local shops and daily service invariably occur within

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[4] Ibid. P 312

walking distance, but not so as to be conscious of the topography. It is the shortcoming of theoretical hypothesis that Frederick Gibberd attempted to avoid in his plan.

Centre

The cluster centre consists of sixty shops, bank, post office, public house, dance hall, library and community centre. There are two small squares separated by a Z-shaped street in order to enclose the views. There seems to be a scattering of public facilities areas rather than a core. The compactness of the neighborhood centre is also destroyed by the through traffic.

In the town centre,traffic and car parking are avoided. The pedestrian mall is designed in association with the various squares. It also balances the movement between shopping areas and squares. There are three interconnected civic spaces, the centre one being the town's meeting place. The tall office tower of the municipal building is the dominant element of the design and overlooks the civic space -- a balcony affords facilities for addressing public meetings. The civic space plateau extends under the buildings into a terrace overlooking the landscaped valley, from where ramps and terraces gradually dissolve the architectural environment into a natural one. [5]

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[5] Frederick Gibberd. Town Design The Architectural Press, 1959. P 171

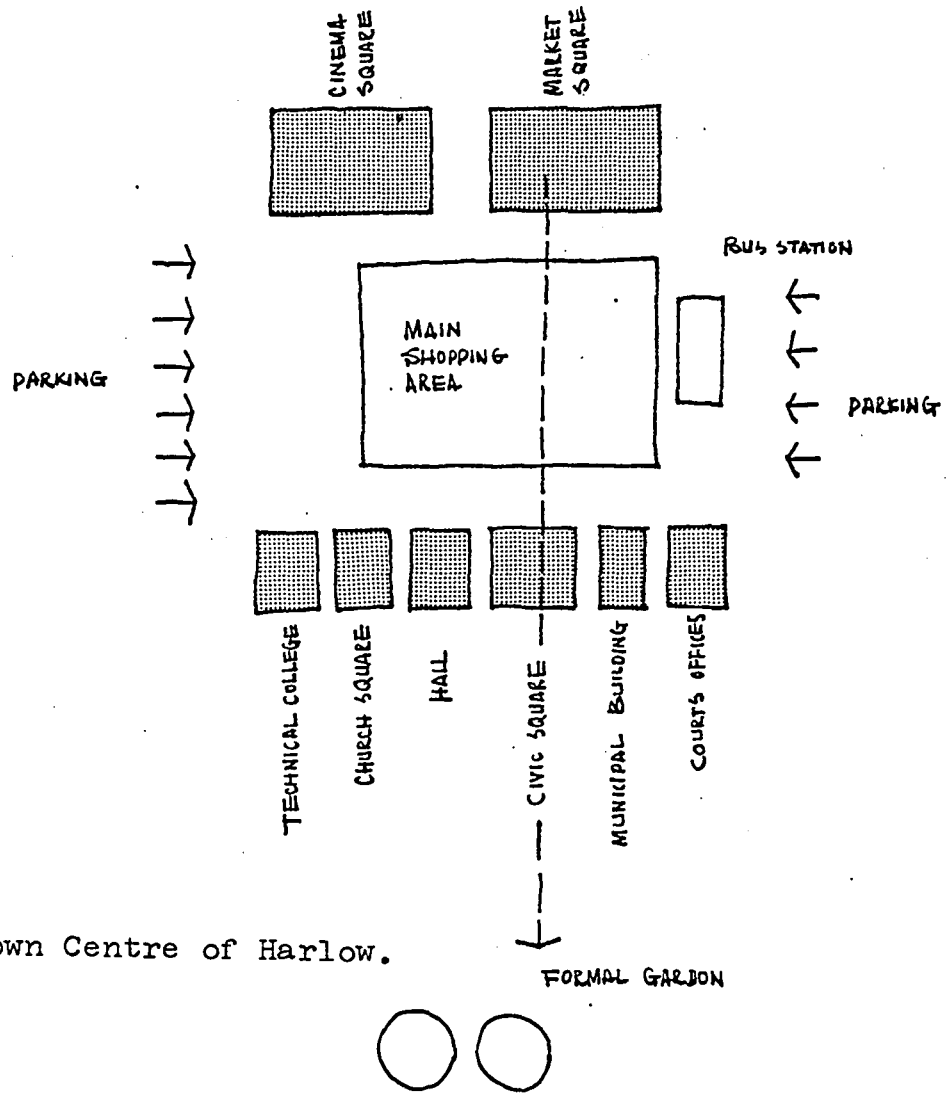

Fig 16. Town Centre of Harlow.

Fig 17. Neighborhood Centre

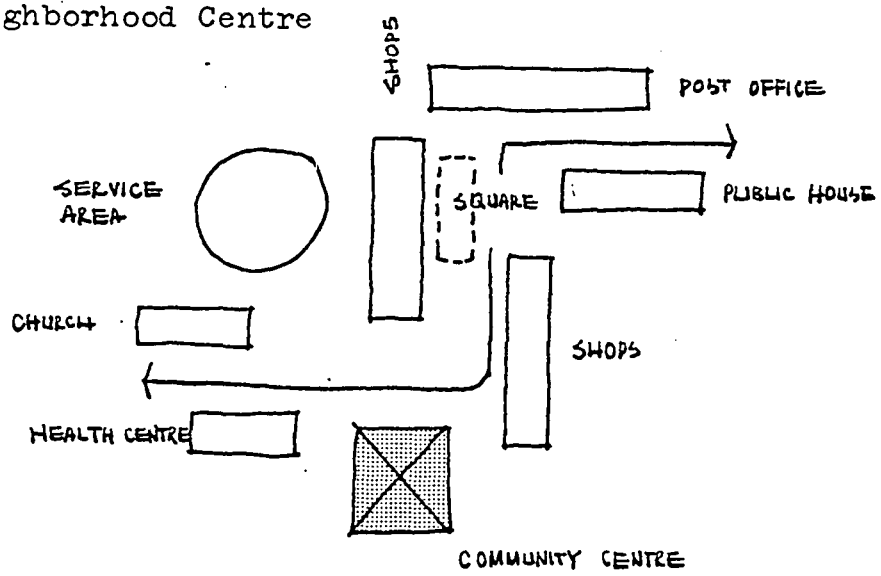

TABLE 1

ALLOCATION OF OPEN SPACE AND RECREATION AREA

ITEM	ACREAGE/1000 PERSONS
Public Recreation Area+	4
Children's Garden	1.5
Private Recreation Place	2
Parks and Pathway	1
Total	8.5

+ Including 0.5 acre for sport and town centre and 0.5 acre for children's playground.

Source: "Neue Stadte in England" By R. Rosner, P 44

TABLE 2

ALLOCATION OF LAND USE

ITEM	ACREAGE
Residential Area	1,560
Industry	320
Schools	315
Commerce and Administration	194
Other area	3,931
Total	6,320

Source: New Housing in Great Britain By Hansmartin Bruckmann

Open Space

Large areas of open space for recreation are connected with the school system to fit the landscape pattern. The Netteswell Cross valley is preserved to form a park adjacent to the town centre.

ARTICULATION:

Road, rail, and river served as the base-line for Harlow. Access to the town is by the new highway from London on the northern boundary. Arterial roads focused on the town centre, run through four major neighborhood clusters to south-east and south-west areas. The internal networks connect parts of the town to one another and to the industrial areas.

The internal circulation is an independent system of minor roads and cycle tracks and pedestrian runs through the residential areas and follow a radiating system with connections between their centres. There are two different degrees of circulation. For fast traffic, the roads pass between the residential areas so that there is an uninterrupted traffic flow and no disturbance to houses. For slow traffic, the roads run through the centres of the areas connecting them together.[6]

The organic pattern of Mark Hall North shows the system of circulation within the neighborhood (Figure 15

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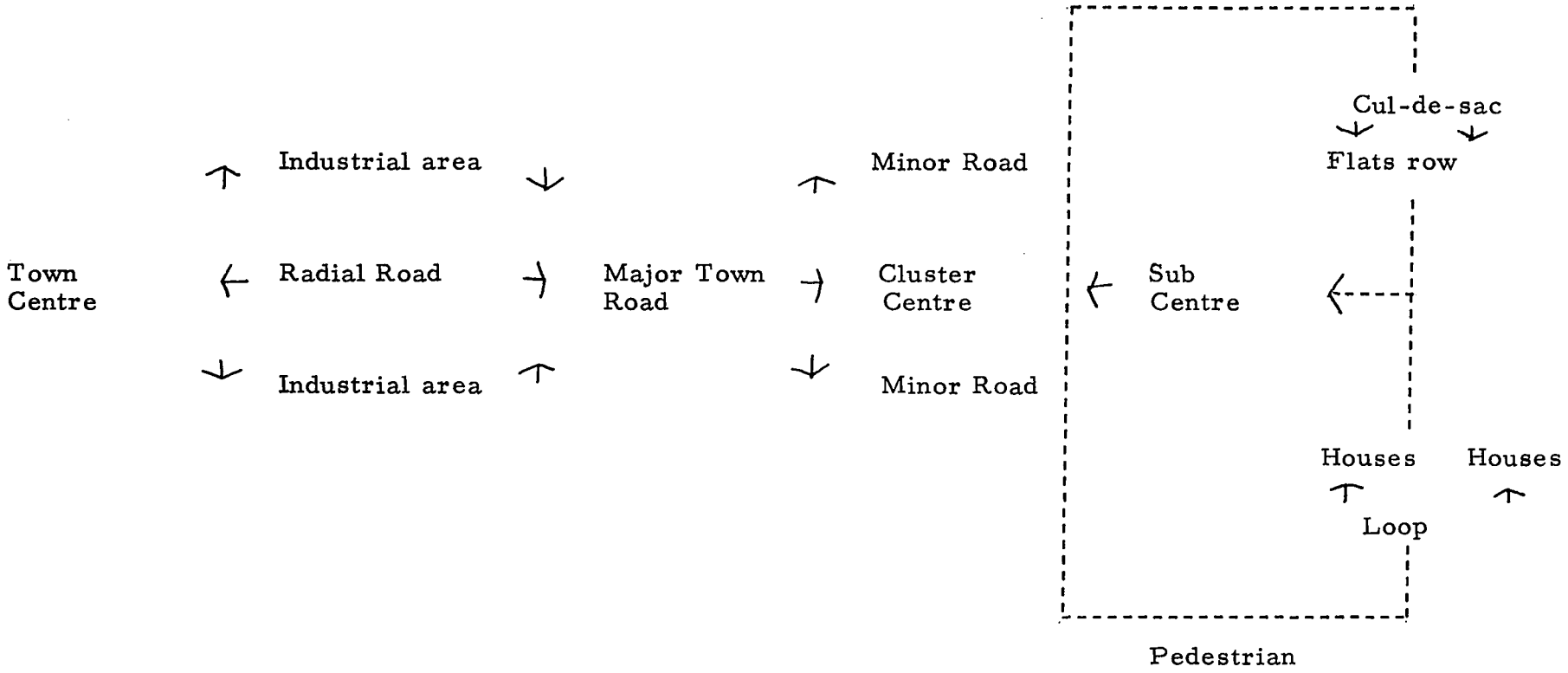
[6] Landscaping the New Town.
Architectural Review, March 1948. P 87


Industrial area
Minor Road
Cul-de-sac
Flats row
Town Centre
Radial Road
Major Town Road
Cluster Centre
Sub Centre
Industrial area
Minor Road
Houses
Houses
Loop
Pedestrian

The layout of dwellings is grouped around 'cul-de-sac' closed squares, or along loops. Spine roads are run through the whole neighborhood to connect the minor collector road from the housing groups to the sub-centre, town centre, and to the rest of the town.

KITIMAT

CONCEPT:

Kitimat, the first complete new town in North America, was sponsored by Alcan of Canada and located in a wild, mountainous area about 400 miles north of Vancouver. Kitimat represents the efforts of combined groups (Clarence Stein was the co-ordinator, Albert Mayer and Julian Whittlesey, the architect and planner).

The plan of Kitimat reflects the early concepts of British Garden Cities, Radburn and Greenbelt. Clarence Stein described "the Garden City idea that the town should be planned for calculated expansion, after which new growth is in a separate new community; the Radburn idea of separating through traffic from the pathways of the local citizen; the Greenbelt idea of surrounding a well-defined town with a belt of farm and forest in place of amorphous 'string' development; a balancing park and greenway system within the town; and finally the idea of the neighborhood."[1]

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[1] Kitimat, America's 'New Town' Prototype Architectural Forum, August 1954. P 121

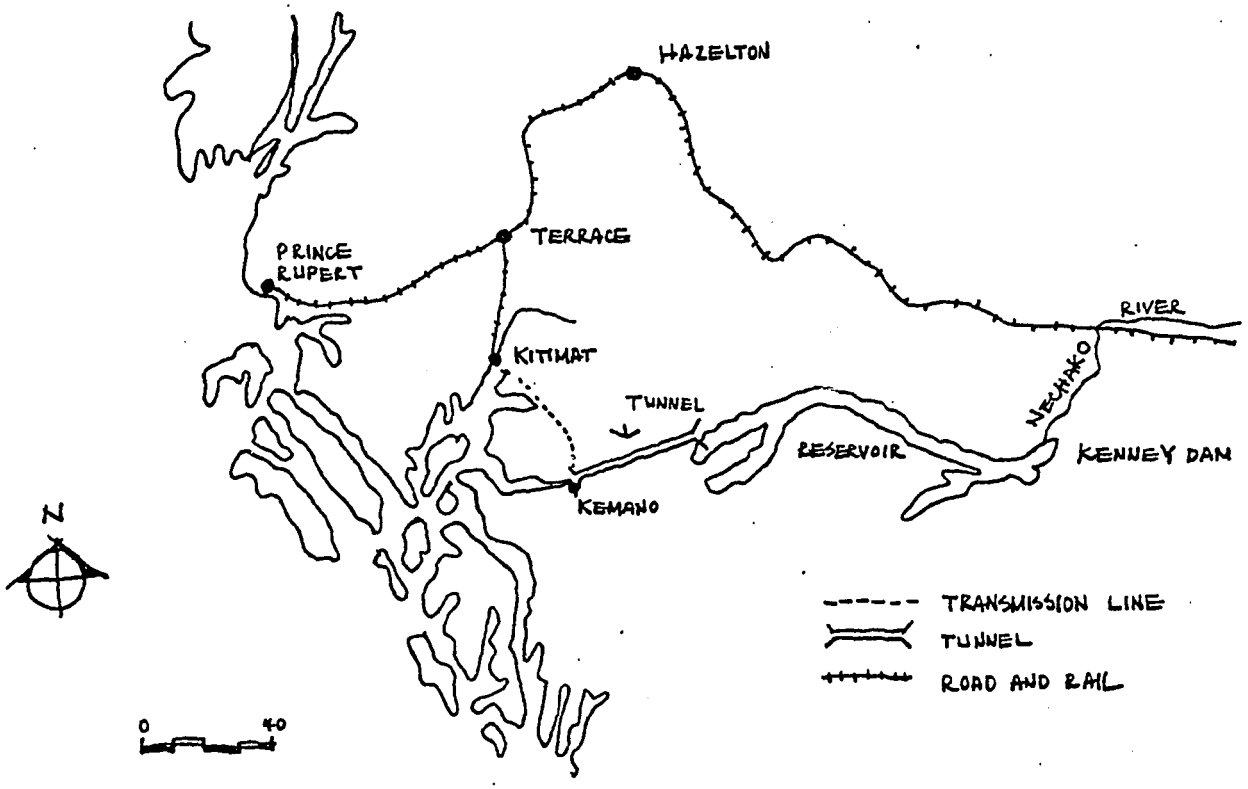

Fig 18. Location of Kitimat.

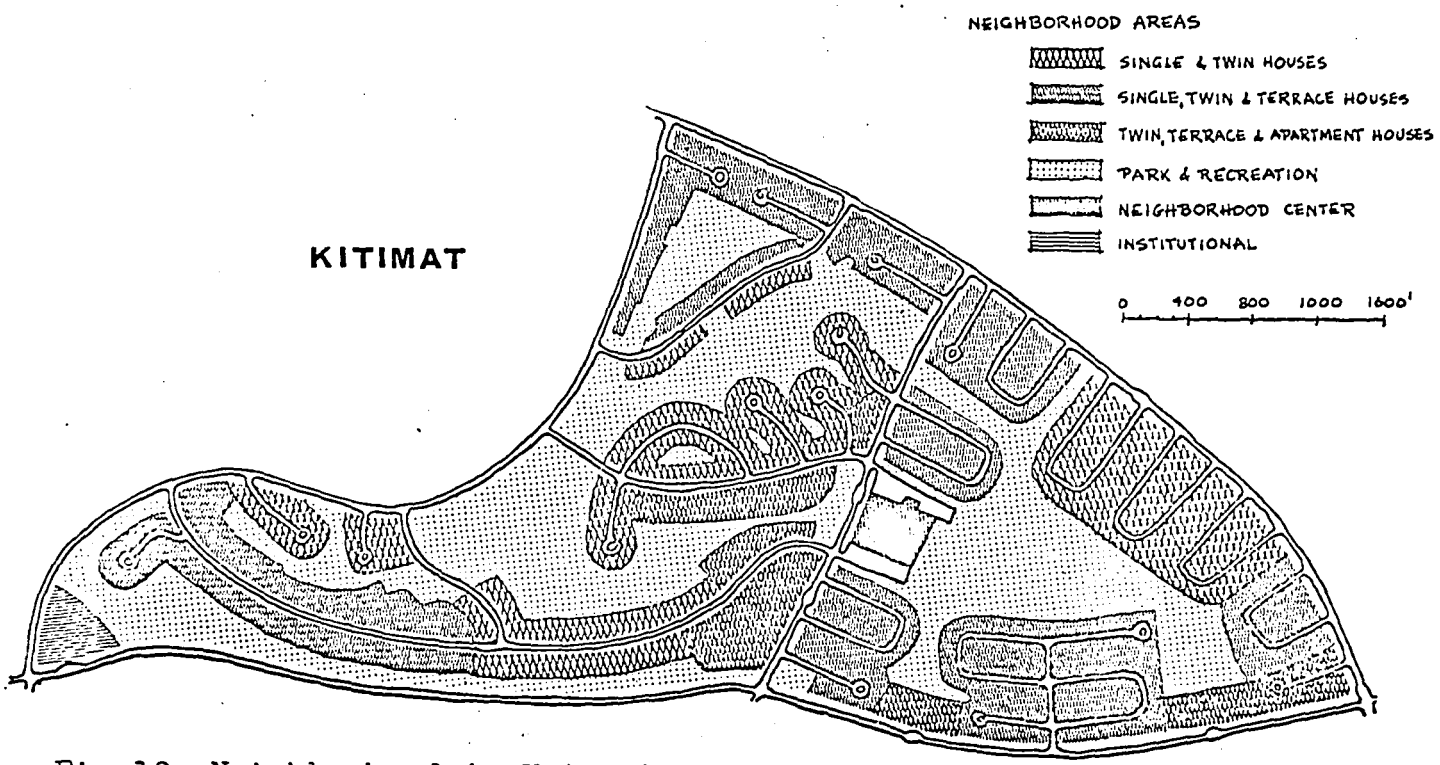

Fig 19. Neighborhood A, Kitimat.

The planning of the new town of Kitimat took into consideration both operational and physical aspects. It has been developed to serve as a flexible setting for good living against the wilderness, and is prepared to change from static scheme to dynamic growth.

Physical planning in Kitimat was integrated with functional planning. In other words, both were considered interdependently and shaped each other. Peter and Cornelia Oberlander evaluated it "an exceptionally comprehensive functional and land-development plan was made, attempting to anticipate the whole range of future urban needs. Its comprehensiveness and thoroughness established the plan as a landmark in programming town development."[2]

SIZE AND DENSITY:

Kitimat consists of 12 residential neighborhoods. In certain sections of the town site the gullied topography led to the sub-neighborhood concept, the neighborhood being linked by its shopping-community centre and school-based sub-neighborhoods of varying sizes.

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[2] Peter and Cornelia Oberlander, Critique: Canada's New Towns. Progressive Architecture, August 1956. P 114

The best neighborhood size is one that can support a local shopping centre and a proper elementary school. In Kitimat the neighborhood optimum was found to be about 1,200 families supporting one supermarket plus competitive food stores in the same centre, and two elementary schools of 300 to 500 pupils.

The lay of the land dictated variations in the sizes of the neighborhoods. There are 5 sub-neighborhoods in the terrain site, the population around 1,300 to 3,400 persons. Apart from these, there are 7 neighborhoods in which the proposed population will range between 4,500 to 6,000 persons. The growth of the whole community was based on four stages as follows: [3]

Stage I	7,000
Stage II	13,000
Stage III	23,500
Stage IV	31,000 to 46,000

Estimates were based on 1.25 workers per family, 1/5 of all workers being single, and the average family's size being 4 persons. 3/4 of the single workers are assumed to be living with families.

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[3] Industry builds Kitimat.
Architectural Forum, July 1954. P 145

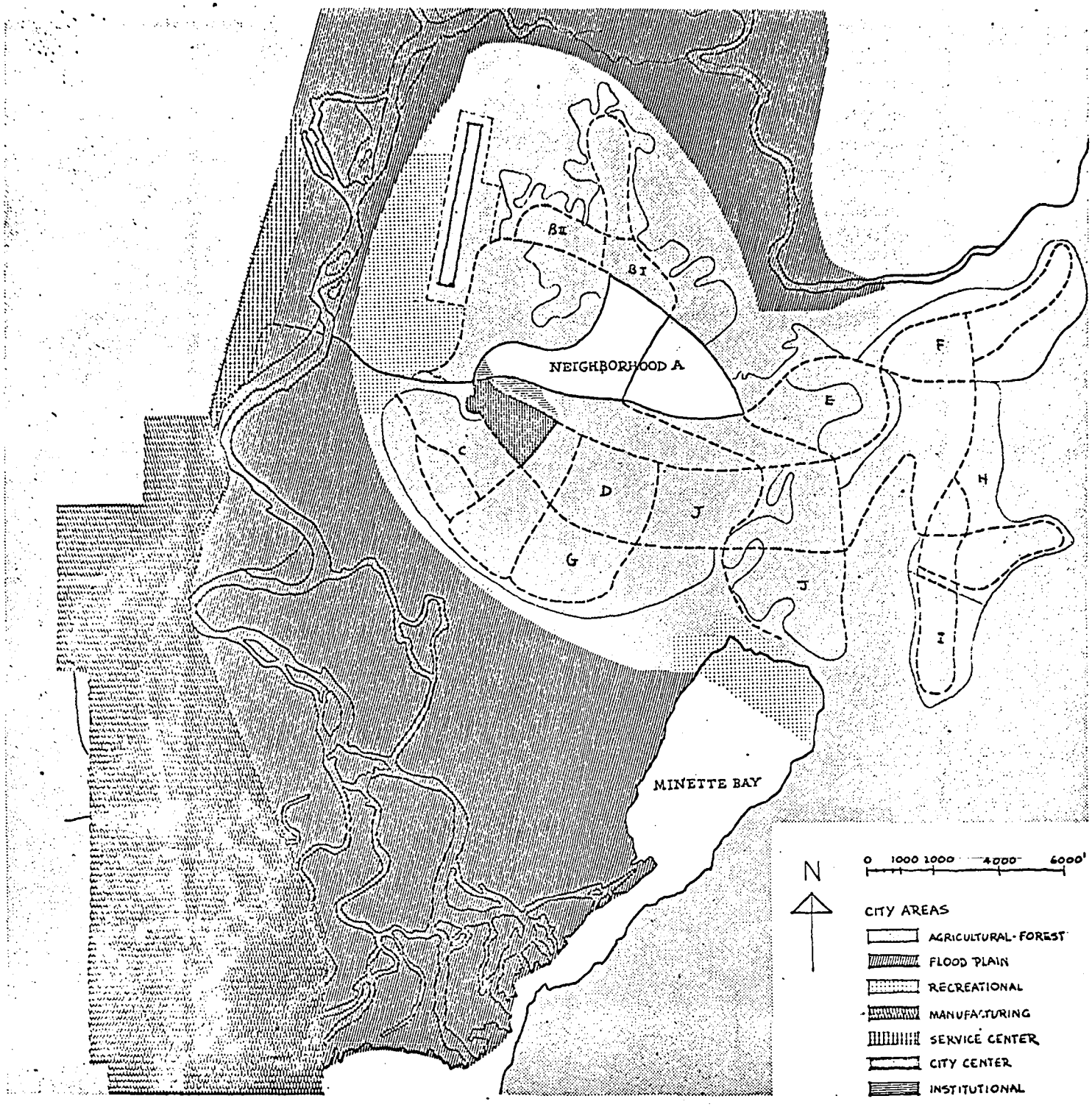

Fig 20. Plan of Kitimat.

In determining the order of neighborhoods, the following factors were considered: economy in length of roads, in sewer lines, in ease of clearance, in first cost and use of school plant, and the desire to have a compact town at every stage of development.[4]

Table 3 summarizes the planners' recommendations for staged development of the various neighborhoods as they relate to the population and employment forecasts.

Neighborhood A was the first developed. The proposed 'gross' density is five dwelling units per acre (excluding gullies and ravines, but including allowances made for grade schools, internal parks, the neighborhood centre, site for public and institutional buildings, and roads within the neighborhood).

ELEMENTS:

Dwelling Units

Neighborhood A had a great number of apartments, row houses and duplexes in the initial stages of the town's growth. This was proposed to fit the various family structures and slightly differed from the rest of neighborhoods so far as the residential

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[4] "Kitimat Townsite Report" Op. Cit. Sec. 6.0

TABLE 3

PROGRAM OF NEIGHBORHOOD DEVELOPMENT BY STAGES - KITIMAT

Stage	Neighborhoods+	No. of potrooms in operation	Population	Employees++
I	A, B-1	2	7,000	2,180
II	B-II, III, IV	2	5,900	1,840
III	C, D	2	10,000	3,300
IV	E, F	6	22,100	6,900

Note. These figures represent increments of growth.

\+ See master plan for Kitimat, above for identification of neighborhoods.

++ These figures take into consideration the estimated employment in the smelter, in the hoped-for pulp and paper mill (and logging activities) and in the services and trades.

Source: "Kitimat Townsite Report" Op. Cit. Sec. 6.0

density and housing types were concerned. The percentages of the dwelling types are as follows:

	%
Single family houses	17
Duplexes	22
Row houses	43.5
Apartments	17.5

Schools

The plan for education was proposed in terms of school administration, composition of schools, optimum size and number of classes and students, by grade. It has been classified into four categories:

1. Junior elementary school - ranging from a small kindergarten to the third grade. These schools are allocated 5-acre sites and are intended for relatively isolated portions of neighborhoods. Since they require neither a principal nor any special equipment, they are considered economical to operate.
2. Elementary school - ranging from kindergarten to the sixth grade. One, or two, of these is planned for each neighborhood; the site allocation is 10 acres. The planners have recommended the upper limit

of 310 pupils and have visualized that certain community facilities for use by the entire neighborhood would be affiliated with this school.

3. Junior high school - ranging from the seventh grade to the ninth grade; approximately one is planned for every two neighborhoods.

4. Senior high school - ranging from the tenth grade to the twelfth grade; two are planned for the ultimate development. This school includes facilities for recreation, sports, theatre, culture and education of adults as well as students. One may eventually develop into a junior college.[5]

Shops

In the critique by Lewis Mumford of the plan of Greenbelt City, he questioned: "Isn't there something you have forgotten -- the little neighborhood stores where you could get a spool of thread or a loaf of bread?" Thus the local stores are limited on three factors: number, size, and distance between them. Stein had figured out that there were three locations per neighborhood, the size of each being about 700 sq. ft., and not closer than 1,000 ft. to the neighborhood centre or to one another.

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[5] V. Joseph Kostka, Neighborhood Planning. Pp. 35-36 The Appraisal Institute of Canada.

Centre

The neighborhood centre includes various amenities such as 30,000 sq.ft. of shopping area, a small 800-seat cinema, a recreation house for adults, and a hostel for single workers.

The town centre is designed for growth by stages and includes many more activities than neighborhood centres. A complete traffic segregation is aimed at here. The entire centre is designed around a series of pedestrian malls and squares which are interconnected and buses stop at points along the outside. Ira M. Robinson commented on this: "These entrance points are well marked by prominent buildings, including those of the civic centre area, which thereby breaks up what would otherwise be a continuous parking area surrounding it. In this respect it differs from most commercial centres which bring few, if any, elements to the outside. In short, an effort was made, with some success, to prevent it from becoming simply a cluster of buildings amidst a sea of parking".[6]

The town centre contains central shopping, retail business, offices, commercial hotel, public library, auditorium, museum, town hall and cinema, central hospital, bus depot.

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[6] Ira M. Robinson. "New Industrial Towns on Canada's Resource Frontier" Research Paper No. 73 Department of Geography, University of Chicago. P 73

The elements of neighborhood were subordinated to Clarence Stein's so-called 'wholistic' approach. He stressed: "What we were really after was the life of the individual, the family, the group; and only secondarily the school system, the health system, the transportation system, which are only joint means to that end". The plan of Kitimat tried to achieve the interrelations and interactions among the shopping-entertainment-cultural activities as well as combining the hospital-health service with the bus-terminus system.

Open Space

In Kitimat, reservation of large areas for public parks, playgrounds, recreation and central green areas, will occupy about 50% of the total land.

ARTICULATION:

Kitimat is accessible by water, by air, by railroad, and by the Kitimat-Terrace road connecting the community with the rest of British Columbia.

In considering the town site, the diagonal alignment of street pattern was designed to break up north-south winds and drifting snow.

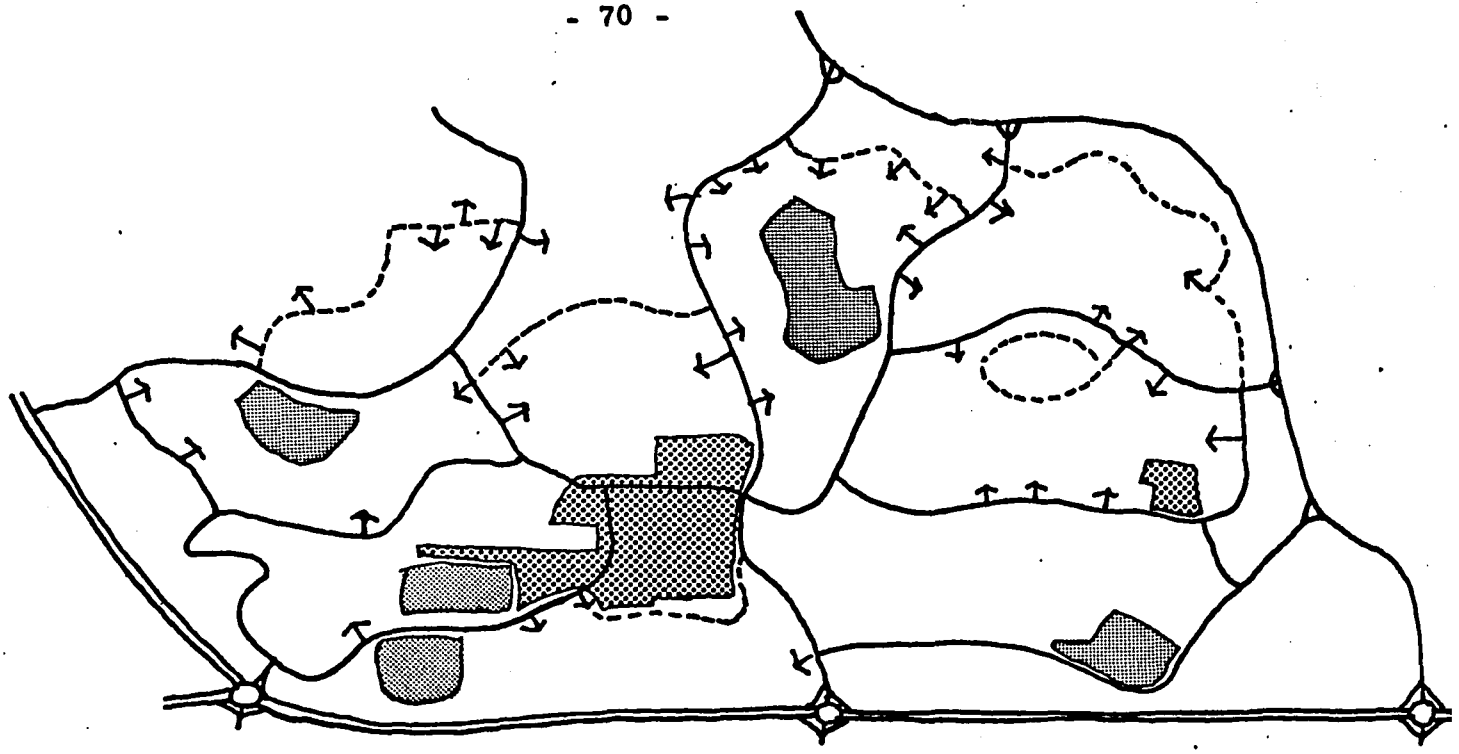
The boundary of neighborhoods is defined by through roads which carry minor collector traffic to the town centre, and which take people to the recreational area, Minette Bay.

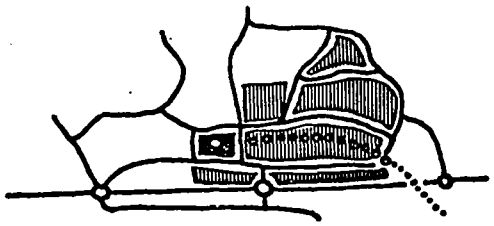
The internal circulation system of the neighborhood is a greenway system balancing the peripheral paved throughways. The pedestrian networks serve to interconnect home, local shops, school and recreation areas of all sorts and sizes ranging from yard, to park, to wild ravine, to surrounding greenbelt. At the conflict points between pedestrian path and vehicular traffic, underpasses will provide a safe way to school, where grades permit.

Local access roads lead inward from the peripheral throughways in the form of loops or cul-de-sacs producing a lacy fringe of houses around the central park.

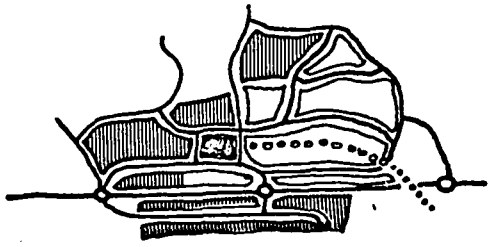
Generally speaking, the land-use plan and street pattern still retain the previously established principles of Clarence Stein. The looproads and cul-de-sac, the superblock with internal greenbelt, the separation of vehicle and pedestrian circulation - these all follow his earlier works.

Single
Loops
Duplex
Cul-
de-
sac
Row
Appartment
Park
Recreational
Areas -
Minette Bay
Interconnect
with another
neighborhood
Town
Centre
Peripheral
Throughways
Local
access
Under
pass
Neighborhood
Centre
Pedestrian
Green Area
Working Places
Loops
Single
Duplex
Cul-
de-
sac
Row
Appartment

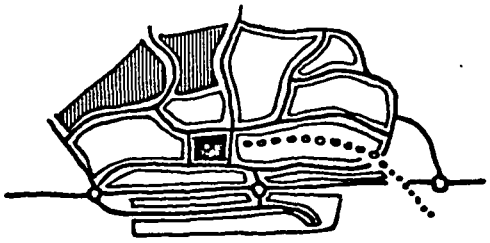




1952 - 53



1953 - 54



1954 - 55

CENTRE

OPEN SPACE

STAGE

FIG 21

VALLINGBY

VALLINGBY

CONCEPT:

Stockholm, like some old cities in Europe, is a city with mixed architectural styles. But it did not grow by itself; it has been planned to some degree since 1640. The planning process was based on the "public ownership of the land" to carry out a master plan through 300 years.

Due to the influx of population to metropolitan Stockholm after World War II, the density in the suburbs began to build up. The development of semi-satellite towns was therefore proposed to prevent urban sprawl and create a high order for the metropolitan growth.

The main concept of the post-war master plan was the preservation of Stockholm's monocentric character, and the dominating position of the central business district. It rejected the continuation of the prewar development process of spreading one-family houses and blocks of flats over the whole outer town area as well as satellite town planning. It recommended a kind of compromise between these two extremes with the inner area of Stockholm's outer, more or less 'dormitory suburb' character,

and the more peripherical parts of the outer town containing both dwellings and a substantial amount of places of work.[1]

There were 18 such communities with a total population of nearly 250,000 in 1963, and five more under construction. Vallingby on the western side of the city is a 'microcosm' of Greater Stockholm.

The master plan for the development of Stockholm was directed by Sven Markelius in the 1940's and modified by Goran Sidenbladh in 1952. There were several objectives:

1. To preserve as intact as possible the very beautiful old parts of the inner city, the city of Stone, with its palaces, parks, bridges and some of the historic narrow streets.
2. At the same time, to revitalize the core area by providing the modern facilities needed and allowing for the growth of central business, institutional and cultural needs of a major metropolitan city.
3. To limit the geographic growth and population of the innercity by providing new satellite towns for present and future growth, thus preventing urban sprawl and its resulting blight.

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[1] B. Wijkmark. The Future Pattern and Form of Urban Settlements: Case Study of Greater Stockholm. Ekistic. Jan. 1967. P 22

4. To define the old city and its satellites by greenbelt open spaces in which building is precluded and recreation is encouraged and developed.

5. To provide employment opportunities in the satellite communities primarily in services, office work and light industry.

6. To provide each satellite with its own multi-purpose town centre including shopping, cultural, administrative and recreational activities -- all scaled to appropriate size.

7. To install an effective rapid rail transit system so that residents of every urban community can enjoy the facilities of the entire Greater Stockholm area for work as well as recreation and culture.

8. To provide an adequate expressway network to handle growing traffic needs.

9. To focus the entire transportation system on the downtown core.[2]

Vallingby resulted from these objectives as a modern, planned suburban unit in the fabric of Greater Stockholm. There were three surrounding units known as Farsta, Högdalen, and Skärholmen.

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[2] From Three emerged One.
AIA Journal, July 1967. P 37

The plan of Vallingby is based on a centrum surrounded by high-rise apartments. Three-storey structures are arranged around the centre to a distance of about 1,500 ft. Beyond that maisonettes, terrace houses and single-family houses reach out to about 2,700 ft.

A large number of prefabricated housing units has been laid out on some aspects of the garden city philosophy. It is grouped with a milk-shop, sand pits, and a small playground. Neighborhood is formed by a superblock system with corner shops, a preparatory school, a large playground, and a collective self-service laundry. The residential area consists of an underground station, a shopping centre, an elementary school, a library, a sports ground, and a dental clinic. The whole community is designed to focus on "centrum" with a "tunnelbane" station.

SIZE AND DENSITY:

Vallingby is 12 kilometers to the west of the city core, a ten minute trip by car. The site occupies 4 square miles of farm land and was planned to accommodate 23,000 inhabitants within a radius of one kilometer of the centre. The Greater Vallingby area including Racksta, Grimsta, Hasselby, Hasselby Strand, and Blackberg, will house 85,000 people.

The hierarchy of settlement units is as follows:

Housing groups - with 500 to 700 inhabitants

Neighborhood groups - with 1,000 to 3,000

Residential area - with 7,000 to 15,000, and

Town district - with 25,000 to 50,000 inhabitants.[3]

In Vallingby there are about 7,500 dwelling units which vary in type and size. The average family size is three persons per unit, and the density is slightly high, 70 persons per acre.

ELEMENTS:

Dwelling Units

Apartments seem to be a major pattern in Vallingby. The majority of dwellings is made up of low-rise walk-ups and multi-storey towers. Most of them are rental units - up to 95%, and the remaining 5% are co-operatively owned.

The reason for providing apartments instead of detached houses are:

1. The commitment to industrialized building which is less adaptable to single-family dwellings.
2. The objective to create densities that can support the metropolitan railroad system.

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[3] Ibid. Ekistic. P 23

3. The corollary objective of preserving the greenbelts from encroachment by low-density development.
4. The pedestrian radius.
5. The post-war housing shortage and the continuance, since the war, of rent control.[4]

Schools

Shops

Centre

There are several neighborhood centres located within the superblock but the major activities concentrate on the centrum. From the planning point of view, the solution adopted for this centre is of particular interest. It is built over the "tunnelbane" and the station is a key building in the scheme. It is designed to serve town and hinterland population of 100,000.

Goods are received and stored in two large underground floors. At street level there are 72 shops placed in a continuous line of frontage 670 metres long. On the floor above there is a restaurant, health centre, and offices. There is also a cinema, library and community centre. The underground train service between Vallingby and Stockholm runs every five minutes and the station is equipped with escalators. Car parking facilities in the

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[4] Ibid. AIA Journal. P 38

proportion of one place for every 5 inhabitants are envisaged but the space around the shop is insufficient.[5] The percentage of car users (36.5% arrive on foot, 26% by car, 9.2% by cycle, and 29% by trains) is far larger than the plan anticipated when providing 600 parking places in the centrum.

One of the few criticisms is that the centrum, like many American examples, suffer visually from a sea of surface parking.

Open Space

Since the layout of Vallingby has been influenced by the Radburn theory, the inner park is formed by cul-de-sac roads. The central greens are designed to be a park and a recreation area of the neighborhood. Moreover, Grimsta Forest and Lake Malar are located within walking distance where the inhabitants can enjoy the amenities of sports, beach, and natural features.

ARTICULATION:

Vallingby is the first European town with traffic segregation, with a separate footpath system leading to all neighborhood centres and through the green parks of all neighborhoods contained within superblocks. Provision for car storage is

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[5] G. Gentiti. Satellite Towns of Stockholm. Urbanistica. Sept. 1958. P 137

on the other side of dwellings only. The internal road system consists of cul-de-sacs with two-way exits in case of emergency. Ring roads are always under- or overpassed. A superblock system has been planned with the main vehicular through road on the periphery.

A great influence in planning the structure for Vallingby was the automobile. In Stockholm in 1945 there were only 9 private cars per 1,000 inhabitants; by the end of 1964 this figure had risen to 190 per 1,000. The increased mobility of the residents tends to make the neighborhood centre less important. On the other hand, neighborhood concentration of dwellings is made increasingly essential by the problem of travelling to the centre of the city. The only feasible solution to this travel problem, for most of those who must make the trip daily, is rail transport. If the railroad or subway is to be an attractive alternative to the private automobile, one should be able to live within walking distance of the railroad station.[6] That is one of the decisions in planning Vallingby to have 12 and 13 storey point blocks around the centrum.

Vallingby has solved the basic problem of the allocation of roles between the core city and its suburbs.

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[6] Göran Sidenbladh. Stockholm: A Planned City. Scientific American. Sept. 1965. P 114.

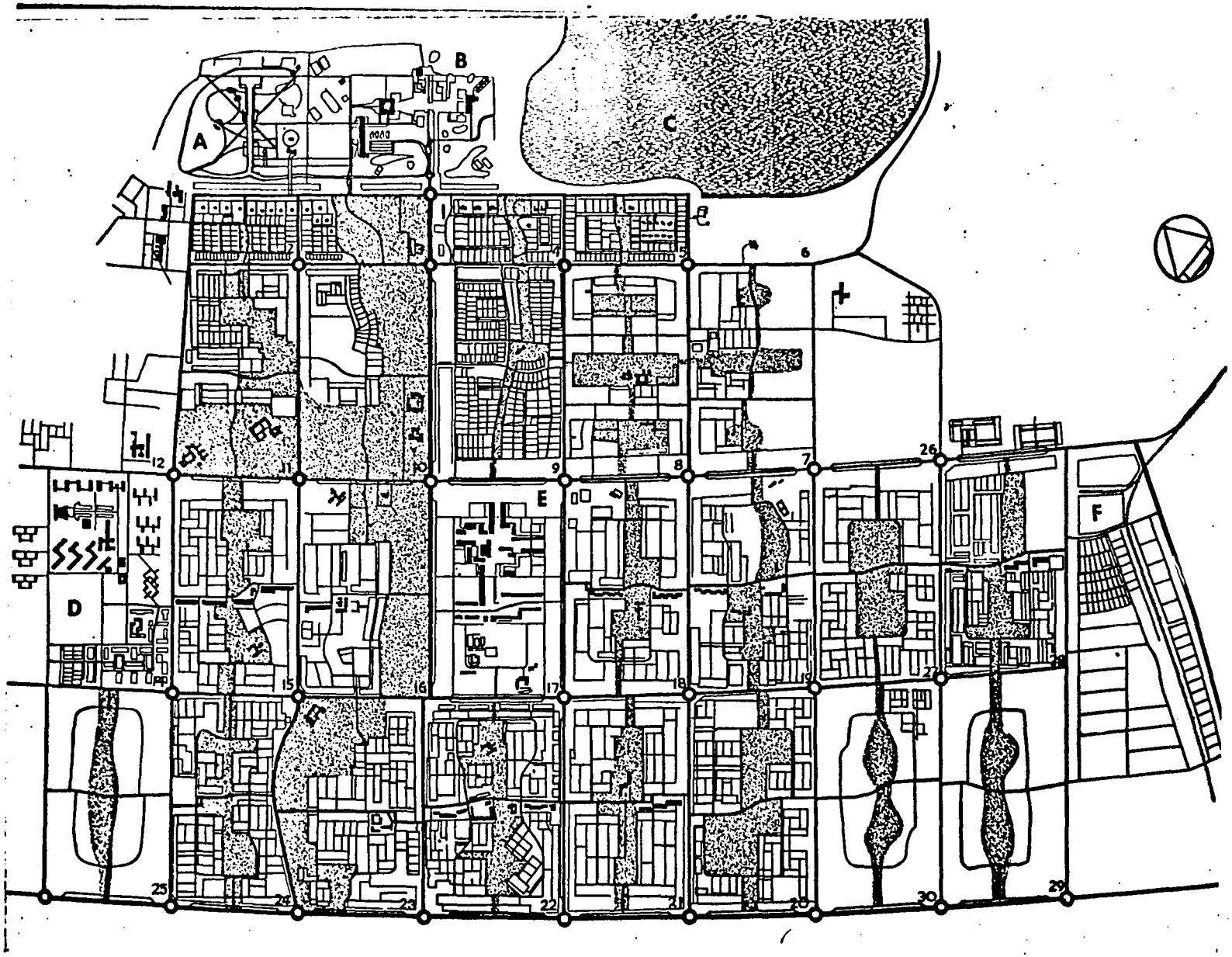

FIG 22 Master plan of Chandigarh by Le Corbusier. A. Rajendra Park. B. Capitol complex. C. Lake. D. University (Sector 14). E. Central business district and civic center (Sector 17). F. Industrial area.

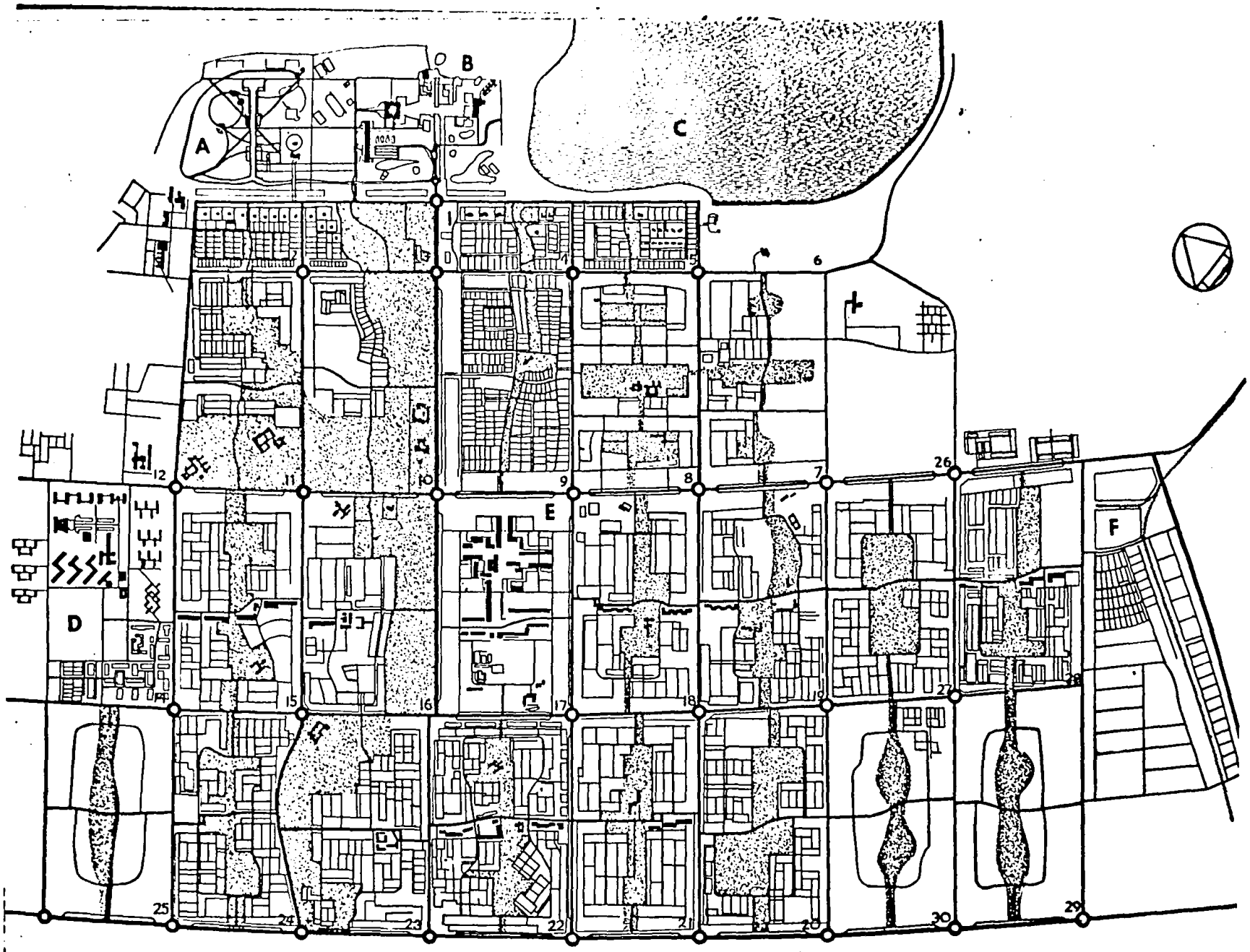

FIG 22. Master plan of Chandigarh by Le Corbusier. A. Rajendra Park. B. Capitol complex. C. Lake. D. University (Sector 14). E. Central business district and civic center (Sector 17). F. Industrial area.

CHANDIGARH

CONCEPT:

The preliminary plan of Chandigarh was designed by Albert Mayer, Whittlesey, and Matheu Novicki in 1949-50.

In Mayer's plan, the town was to be based on a system of superblocks containing about 3,500 families for lower and middle classes, and for wealthier settlers. There are three groups within a superblock. Each superblock (100 acres) consists of various housing types, a local shopping bazaar, primary and middle schools, and parkland. These superblocks are surrounded by a grid of traffic roads and connected with the industrial estate and railway.

In Novicki's plan, the superblock L-37 (75 acres) was designed in detail to accommodate 1,175 families. As in Mayer's plan, an open area of parkland was in the centre and was surrounded by various dwellings. The neighborhood was provided with nursery, primary, and middle schools. In order to achieve the features of Indian village life, a temple was placed near the centre of the block to associate with various communal functions. The Novicki master plan for Chandigarh was designed as a branch of a tree and the superblock as a leaf plan.

Mayer's project was revised by Le Corbusier and his team (Maxwell Fry, Pierre Jeanneret, Jane Drew). The site of the capital was shifted to the north-west to take advantage of greater elevation against the Himalayas as a "head" of the city.

The idea of the superblock unit appeared in Le Corbusier's early works and in Ville Radieuse. Here, it was employed in making up the fabric of the town.

The concept of the new neighborhood pattern has been described by Maxwell Fry. He said: "Day-to-day life in the sector has two aspects. First, the life of activity, shopping, 'rubbing shoulders' represented by the V4 main street, in India the Bazaar street that runs irregularly across the sector and on the shady side only of which are placed the shops, local markets, offices, cinemas, etc., with plenty of shade trees and off-street parking space. Second, is the leisure aspect of sport for youth, recreation in general, education and relaxation, represented by a hand of open space running in the contrary direction, both of them continuing from sector to sector across the plan".[1]

The establishment of new towns within 5 miles around Chandigarh was prohibited under the periphery control act of 1952. Consequently it would be surrounded by a permanent greenbelt.

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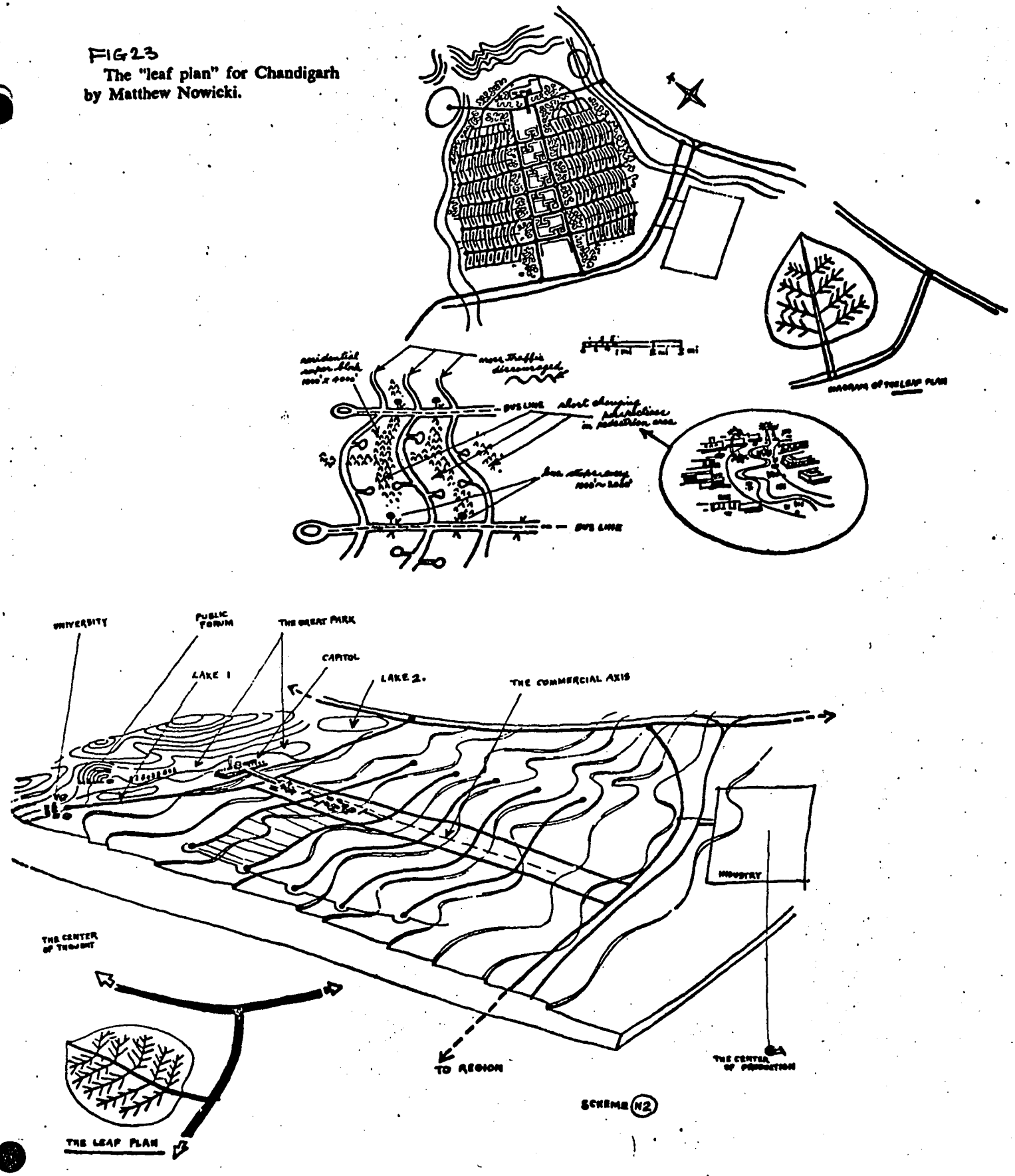
[1] E. Maxwell Fry. Chandigarh - New Capital City. Architectural Record. June 1955. P 140

FIG 23
The "leaf plan" for Chandigarh by Matthew Nowicki.



Due to rapid population growth, L.R. Vagele has pointed out, Chandigarh is becoming a nodal point of a developing region. He said: "Chandigarh cannot be a static town. Its dynamic growth has to be planned and provided for. It is necessary to delineate the city-centred region on the basis of regional analysis and to investigate the alternative regional settlement patterns which are possible and feasible.

The development of Chandigarh and the other settlement in its sphere of influence should form an integral part of a strategy of comprehensive regional development". [2]

SIZE AND DENSITY:

The plan of Chandigarh was prepared to accommodate a population of 150,000 in the first stage, with a second stage to provide for an ultimate population of 500,000.

The idea of population distribution was first set forth in the Mayer plan. Neighborhood units are classified into three income groups, and the density patterns follow the income groups ranging from 25 persons per acre in the upper class districts, to 50 persons per acre in middle class sectors, and 75 persons per acre in the lower class areas.

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[2] L.R. Vagele. A Case Study of Chandigarh and its Growth Potential. Ekistics. Feb.1967. Pp. 98-105

In anticipation of social change, Le Corbusier's 'sector' includes houses of thirteen different income categories. Nearly 90% of settlers came to Chandigarh and other urban places in its environs before 1955. The proportion of the population is very low in the over 35 age group, but its environs have a high percentage of working population (nearly 40%).[3]

The housing accommodation provided has been correlated with income irrespective of family size so that segregation of households on the basis of pay-scales has not been avoided.[4]

According to the survey the average household contained 3.6 persons; this would indicate that the old joint family has been largely abandoned by the inhabitants of Chandigarh. Individuals living by themselves constituted 29.4% of the households, 12.0% contained two persons, and 20.6% of the households contained six persons or more.[5]

The density of dwellings is generally low but the population has been growing faster than Le Corbusier had anticipated. From the latest report, the provision of housing and community facilities has not kept pace with the rapid increase in population.

3, Ibid. Ekistics.

4, Ibid. Ekistics.

5. Norma Evenson. Chandigarh. University of California Press 1966. P 58

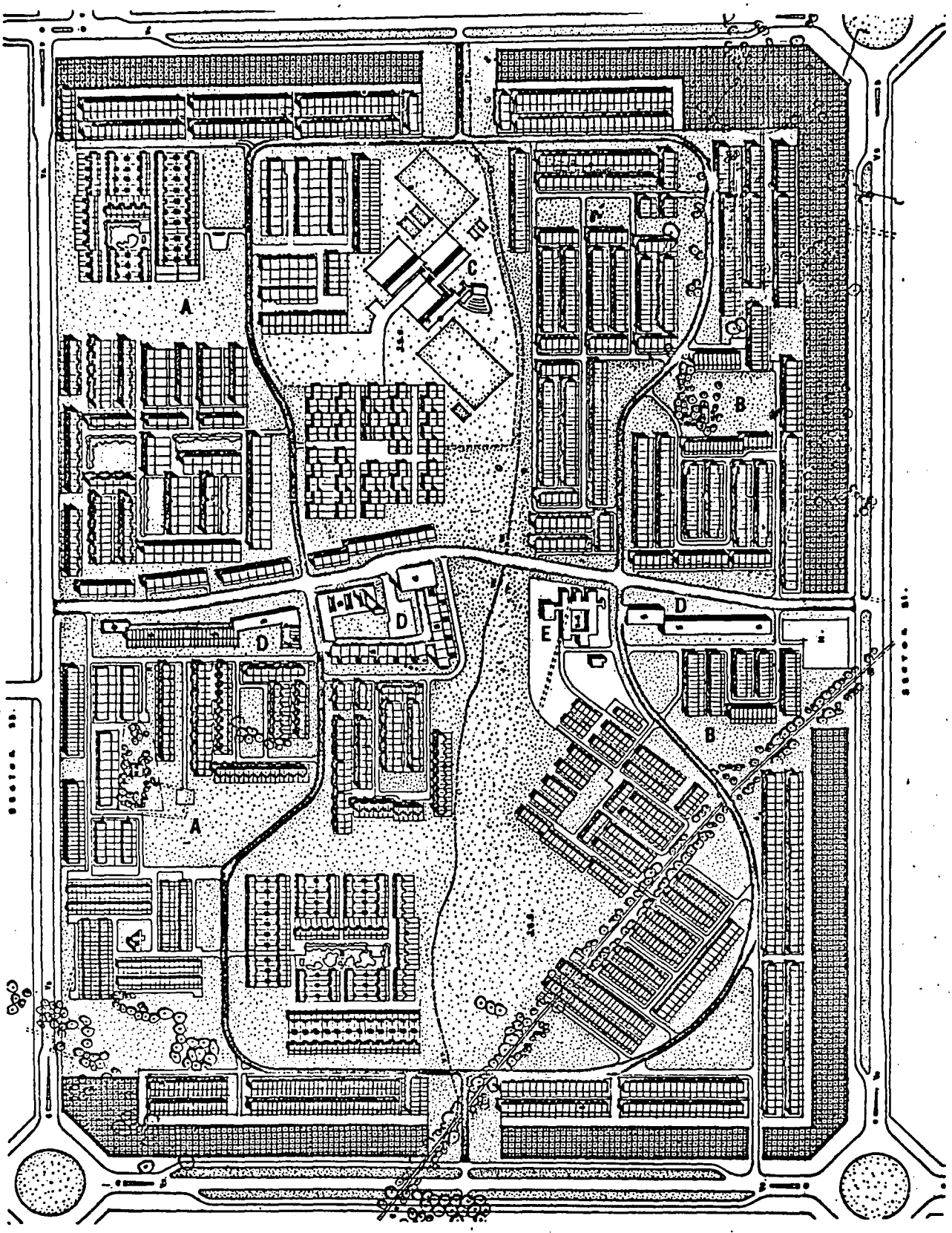

FIG24 THE SECTOR 22.

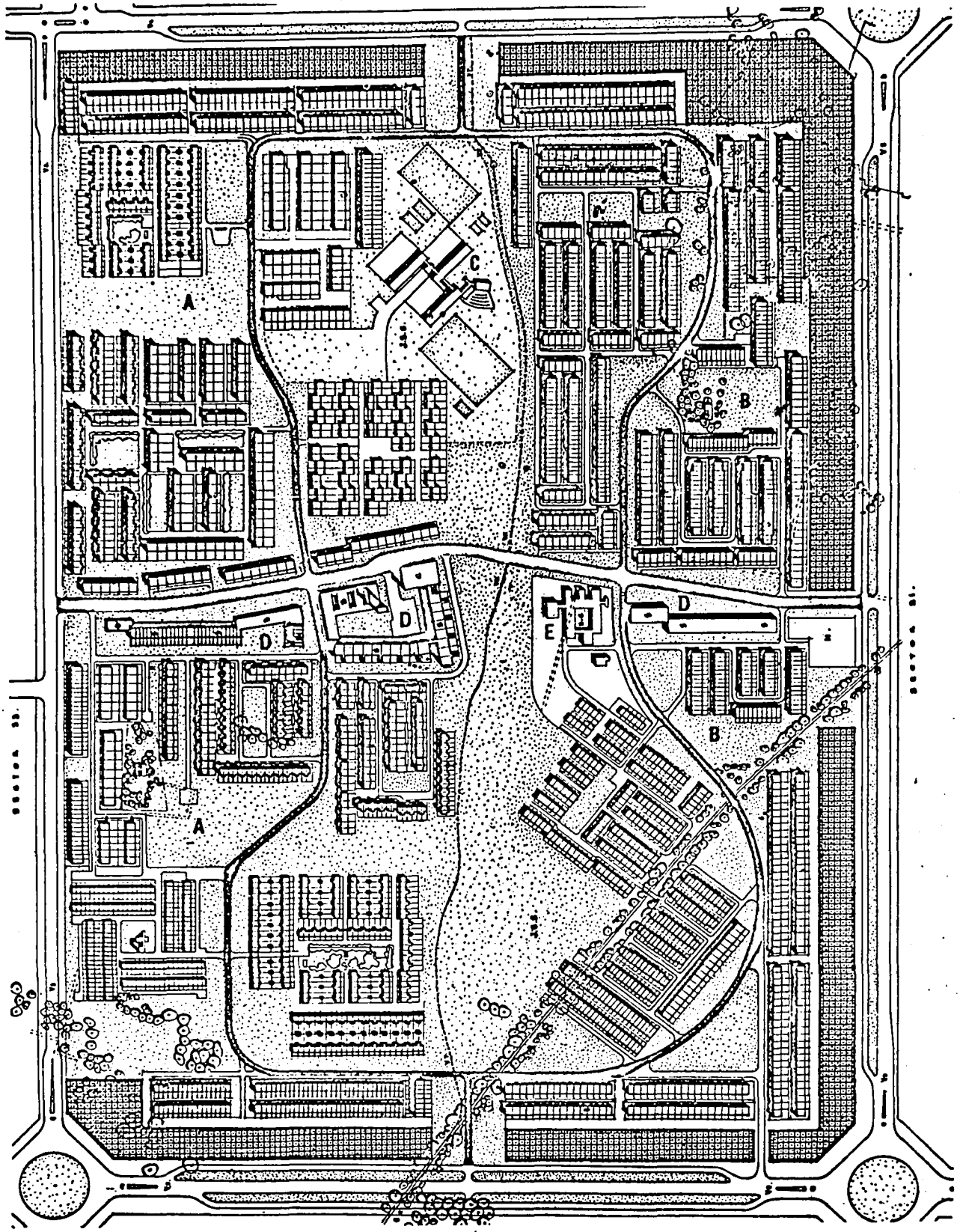

FIG24 THE SECTOR 22.

ELEMENTS:

Dwelling Units

Sector No. 22 was the sector that was almost built-up. The sector is horizontal development of row houses including government housing and private housing. The whole town was projected so that about 70% of the buildings would be private residential plots ranging in size from 75 sq.yds. to 5,000 sq.yds. In examining the layout of the housing units, there seems to be too much open space between dwellings and the compactness found in old Indian villages is lacking.

Schools

School sectors are classified into four types:

nursery schools

primary schools

junior secondary schools, and

higher secondary schools (high school)

In the first stage most of the schools were designed by Pierre Jeanneret and Jane Drew.

ELEMENTS:

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nursery schools

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TABLE 4

PROPOSED AND EXISTING LAND USES IN CHANDIGARH

	Type of land use	Envisaged land use %	Present land use %
1.	Residential	21.0	21.0
2.	Commercial	4.2	4.0
3.	Industrial	2.3	6.0
4.	Educational and Administrative	9.0	21.8
5.	Parks and other open space	24.8	26.7
6.	Roads and Streets	18.6	20.5
7.	Land not committed to any use	20.1	-
	Total	100.	100.

Source: A Case Study of Chandigarh and its Growth Potential.

Ekistics. Feb.1967

Shops

In the old Indian towns, shops are often along both sides of narrow streets. The sense of urbanity is intensified by the movement of the crowds. The shopping area " Bazaar street" in sector 22, was designed as "shops-cum-flats" with two floors of living quarters above the ground floor shops to fit the need of Indian shop owners. The local shopping centres of each neighborhood are located along the south side of the east-west V4 street.

Jane Drew' s bazaar buildings for sector 22 have been criticized thus "...reproduces much of the antiseptic vacancy of an American suburban shopping centre, lacking only the twenty-acre parking lots to complete the illusion". [6]

Centre

The central business district, sector 17, was divided into two parts by the V4 shopping street. The northern section (125 acres) is to serve as the major commercial and civic focus of the city. It contains the town hall, central library, post office, chamber of commerce, banks and insurance offices. The southern division was designed as the centre of district administration.

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[6] Ibid. Norma Evenson. P 56

Open Space

Parks and open space are planned along the line of an eroded stream bed that Le Corbusier called 'Valley of Leisure' and contains a gorge five to six meters deep and runs parallel to the principal axis. The green spaces running through each neighborhood are connected to form a landscape pattern in the gridiron.

The artificial lake to the east of the capital complex was developed as a civic recreation area. The water offers a remarkable vista toward the Himalaya mountains. It is very important to include natural beauty as a part of a daily life to offset the poverty of the people, the drabness of lives, and the lack of recreation in Asian countries.

ARTICULATION:

In the Ville Radieuse, the fast traffic is to be on elevated highways leaving the ground free for pedestrian use. Le Corbusier's plan was concerned only with motor and pedestrian separation. But the circulation in the Chandigarh plan is much more flexible, meeting the pressures of city life better than some of his earlier works.

The Chandigarh plan is based on the analysis of seven V road functions with respect to the delicate coherence of the city as

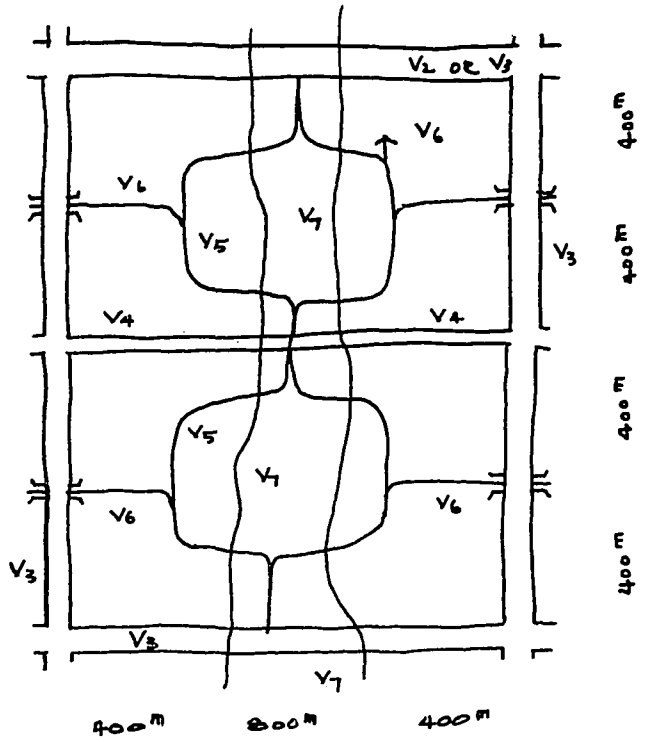

Figure 25. Seven V's, Chandigarh

The features of this plan are "sectors" (800 x 1200 meters) which are used for the first time. These sectors are enclosed by 'V3' roads allocated to mechanical transport, to which there is no direct access from the houses. Each sector embraces the daily 24-hour life of a population which can grow from 5,000 to 25,000 inhabitants, and contains essential services.

Source: Le Corbusier. My Work.
Architectural Press, London 1960. P 175

a whole. The framework of the plan is on a large modular grid with seven types of traffic and paths as follows:

V1 Regional highway

V2 Main horizontal axis of the town

V3 Segregated fast-moving traffic road, without sidewalks or any frontage development

V4 Shopping street, with business and parking

V5 Residential slow traffic, with minimum frontage development

V6 House access road, paths

V7 Recreational or cycle road in parkway or open space.

The modular gridiron is formed by V3 roads intersecting at half-mile intervals in one direction and three-quarter mile intervals in the other. The gridiron encloses about 240 acres and houses up to 15,000 people.

The roads are of the same width and scale except for the principal vertical axis and two roads across the plan. The only difference from the ancient gridiron is that the road junctions are roundabouts.[7] The tree planting was used to identify the main roads, and to provide overhead shade on the fast-traffic road.

In examining the system of Chandigarh, Norma Evenson remarked: "What is inexcusable, however, is that they would neglect

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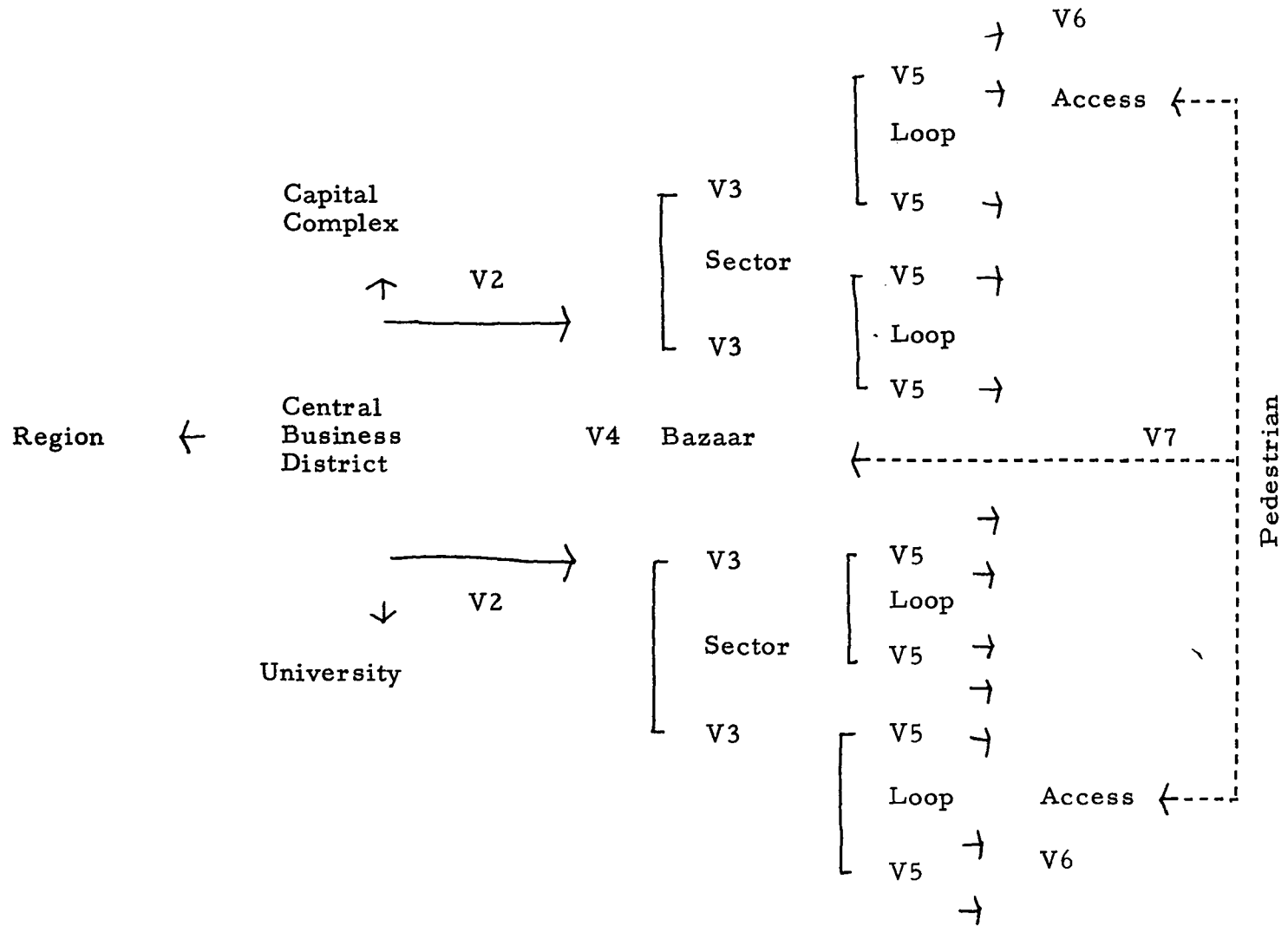
[7] Frederick Gibberd. Town Design. The Architectural Press, 1959. P 48


V6
V5
Access
Loop
V5
Capital
Complex
V3
Sector
V2
V5
Loop
V3
V5
Region
Central
Business
District
V4
Bazaar
V7
Pedestrian
V3
V5
Loop
V2
Sector
V5
University
V3
V5
Loop
Access
V5
V6

to provide for a non-motorized interim period and that they would establish a pattern of growth for the city so loosely dispersed as to make pedestrian circulation within the city extremely difficult and adequate public transport impossible. What Chandigarh needed in its early development and continues to need, is compactness, not only from the standpoint of urban aesthetics, but also for the practical functioning of the city".[8]

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8 Ibid. Chandigarh. P 96

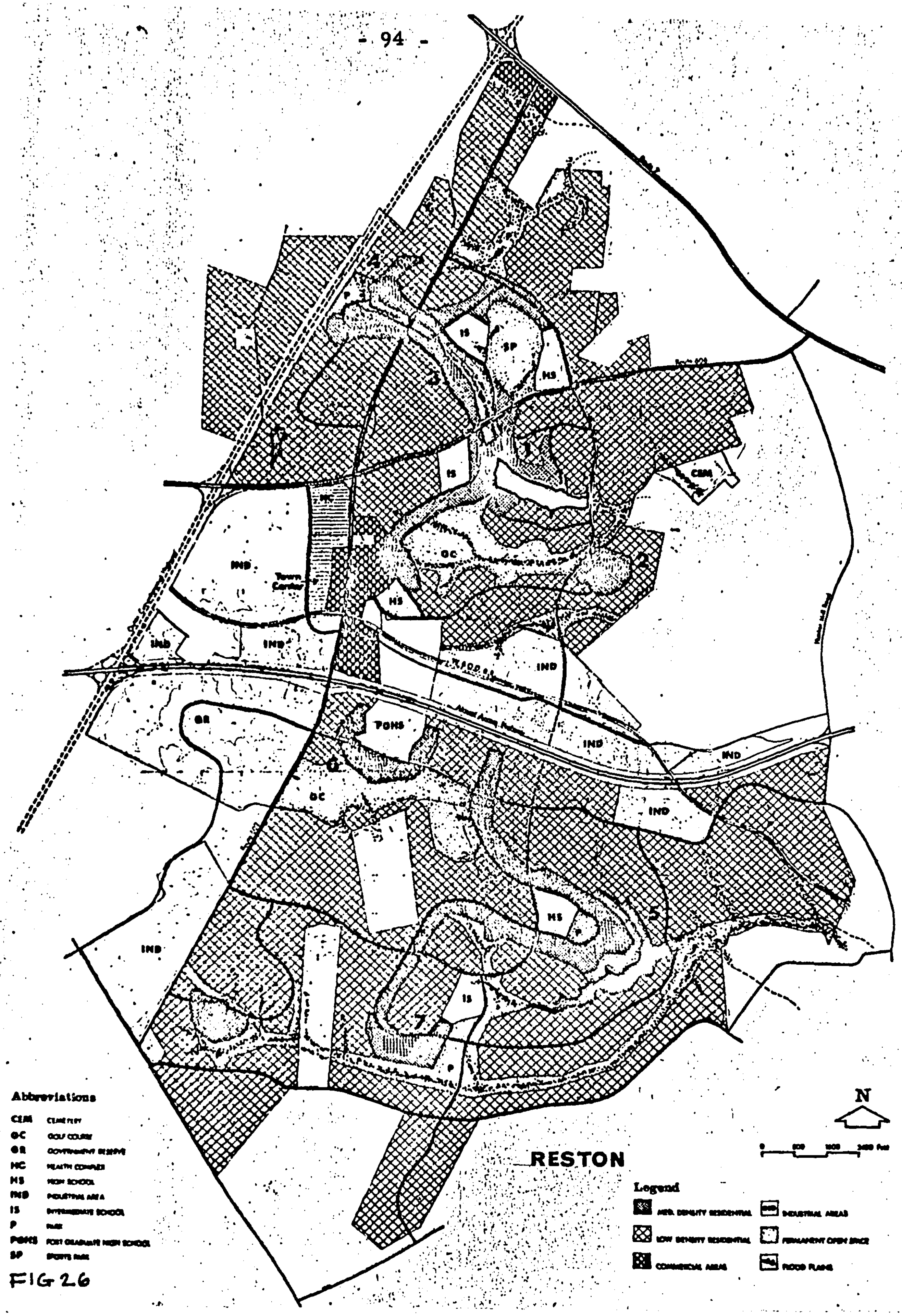
RESTON
Abbreviations
CEM
GC
GR
HC
HS
IND
IS
P
PGHS
SP
Legend
N
IS
SP
HS
CEM
GC
IND
Town Center
PGHS
GR
P

FIG 26

RESTON

CONCEPT:

The enormous increase in the population of American cities and the widespread use of the automobile reveal that suburban sprawl or single-family sub-divisions cannot be a pattern of the metropolis in the next few decades. Since the Greater London plan was based on a static concept, it has failed to keep pace with the growth of metropolitan London and has now been abandoned. The Year 2000 Plan of Washington prepared by the National Capitol Planning Commission, recommended the intercity corridors to meet the distribution of population with respect to control over open spaces between the spokes.

Reston was conceived as a pattern to spin off the growth of the metropolitan Washington-Baltimore area into separate self-contained communities. It is located in Fairfax county, Virginia, 18 miles west of Washington D. C. and 4 miles east of the Dulles International Airport. The intention of the plan is based on two convictions: "people should be able to do the things they enjoy, near where they live. Many Americans want the stability of belonging to one community for a lifetime. They are tired of rootlessness".[1]

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[1] Intercity II. Harvard University 1965. P 1.1

The 'country-city' environment is comprised of seven distinct villages, each with its own centre related to a different feature of the topography. The high density 'sinew' with town houses is located along central walkways and activity areas, and connect with local shopping centres and schools. Individual houses are grouped in compact clusters with wooded recreational areas. The light-industry parks are planned for the local employees.

Reston is not being built as part of a national program. It is developed by Rober E. Simon, Jr. in the hope of profit. Therefore it is planned to provide for the upper middle income group in the early stages. In Simon's mind, Reston is a new town ideal. He decided to build town houses in order to gain a maximum amount of open space. He stressed on physical planning and design concepts made the first village centre a remarkable example of urban architecture.

As it lacked a social mixture of income groups, the Federal Government would not support the development. The economic success still remains in doubt. J.M. Dixon commented on the future of Reston: " It has the richness of townscape that every sub-division lacks. But this richness has been achieved at the sacrifice of the cherished feature that every sub-division offers: a private castle for every family. In order to win public acceptance, the design of Reston has to appease the American desire for independence". [2]

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[2] Progress in Planning: A New Town Brings Urban Living Patterns to the Countryside. Forum, April 1965. P 84

SIZE AND DENSITY:

The site of Reston is 6,750 acres of rolling pastures and woodlands. The high density areas will be 60 persons per acre in high-rise apartment buildings with clusters of town houses at the density of 14 people to the acre. The pedestrian walkways relate to low density houses around the village centre with the high density sinews at the centre. Some low density house lots are also available and those areas will have a density of 3.8 persons per acre.

TABLE 5

ALLOCATION OF LANDS - RESTON

Item	Percentage
	%
Residential	56.1
Commercial Industrial Transportation	14.6
Public right-of-way	9.8
Institutional	5.0
Open space	14.5
Total:	100.0 %

ELEMENTS:

Dwelling Units

There are three types of housing provisions:

(a) Village centre housing - high rise apartments, group clusters, and maisonettes.

(b) Recreational area housing - attached, and detached clusters focusing on the recreational areas with immediate access to its use.

(c) Rural setting housing - medium density clusters with private patio or yard areas.

The basic configuration is one of cluster housing with a clear distinction between private and public areas.

Simon has faced the problem of cost with respect to the dwelling layout. One worker said: "It took a genius to frame those first 227 town houses" because there were 37 different floor plans with special features in each house. As the construction workers ran into an unfamiliar problem, the cost increased inevitably. It seems a dilemma between the cost and ideal type still exists.

Schools

Shops

Centre

Elementary schools will be grouped with churches and connected by pedestrian paths which run through the high density sinews.

The first village centre, Lake Anne, is almost completely built. It is reserved for pedestrians with shops, restaurant and facilities as focal points of community life and activity. The centre is built around an artificial lake which is used for swimming and boating. The first phase of construction was divided into three sections. Each has been designed by different architects. The three firms are: (1) Charles M. Goodman Associates, (2) Chloethiel Woodard Smith, and (3) Whittlesey and Conklin who had done the master plan for Reston. They attempted to find "a sense of belonging to a group of houses, somewhat like the traditional block" and give the residents something else which was missed in the typical sub-division.

The town centre will be built in stages to follow the growth of the new villages. It is intended "to reunite the town again, to reinstate the city as a desirable and exciting place to live in, and to distinguish it from more rural areas".[3]

Open Space

The total coverage of recreation and open space will be about 1,600 acres; 100 acres of lake, 400 acres for golf, 1100 acres for park and public space. It is approximately 20 acres per 1,000 inhabitants. Recreation areas are developed around each village centre, with golf courses and tennis courts available on a club basis.

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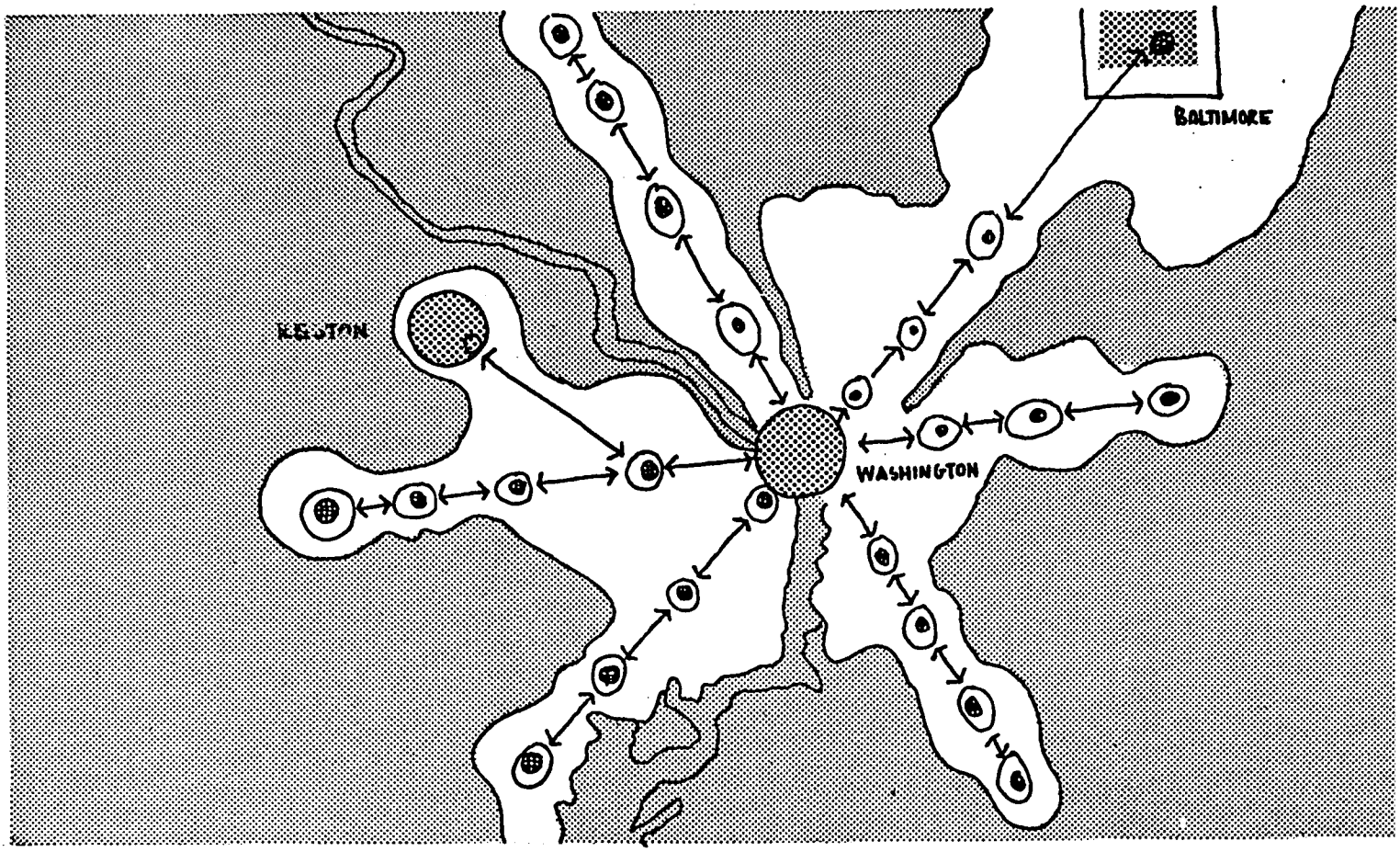
[3] The New Town. Progressive Architecture. June 1965.



Mode of attaching suburban communities to the radiating arteries in the Washington corridor plan 'for the year 2000'

1 freeway, 2 rapid transit, 3 intensive industry, 4 controlled open spaces and parkland, 5 shopping and administration, 6 residential

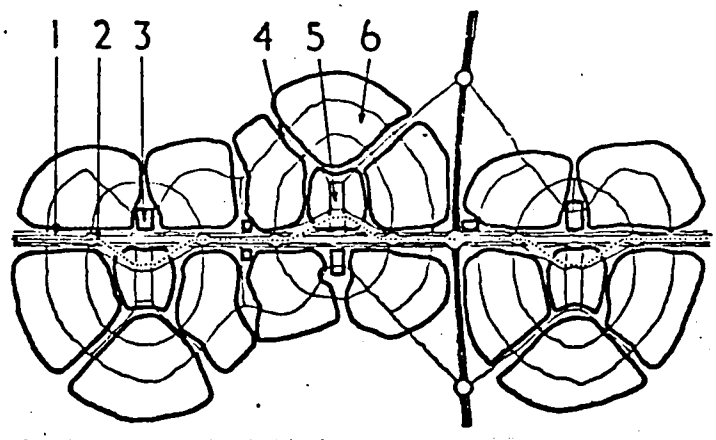


Fig 27. The Washington Corridor Plan for the Year 2000.

ARTICULATION:

The object of the internal circulation of Reston is to achieve the maximum flexibility in relation to its surroundings. Reston is a new pattern of Washington's corridors, with some principles of the corridor cities. The principles described in the Harvard's Sixth Urban Design Conference were as follows:

1. Easy access to recreational space.
2. Easy access to the central city.
3. Provision for group life in the town centre.
4. Maximum choice for individual life patterns.
5. Cross circulation between corridors without encouraging intense inter-corridor development.
6. Full consideration to use of open space between corridors by designation as recreation, conservation, farm, institutional, and other uses.[4]

The plan of Reston assumed the continued use of the automobile, but attempted to reduce the complete dependence upon it in order to revive the spirit of medieval towns. As "The Reston Story" (Brochure, 1962) said: "The home itself, in terms of transportation, is a pedestrian island. We meet our friends and have family life as pedestrians. The school is a pedestrian island; most forms of recreation are pedestrian island; the golf course, the baseball

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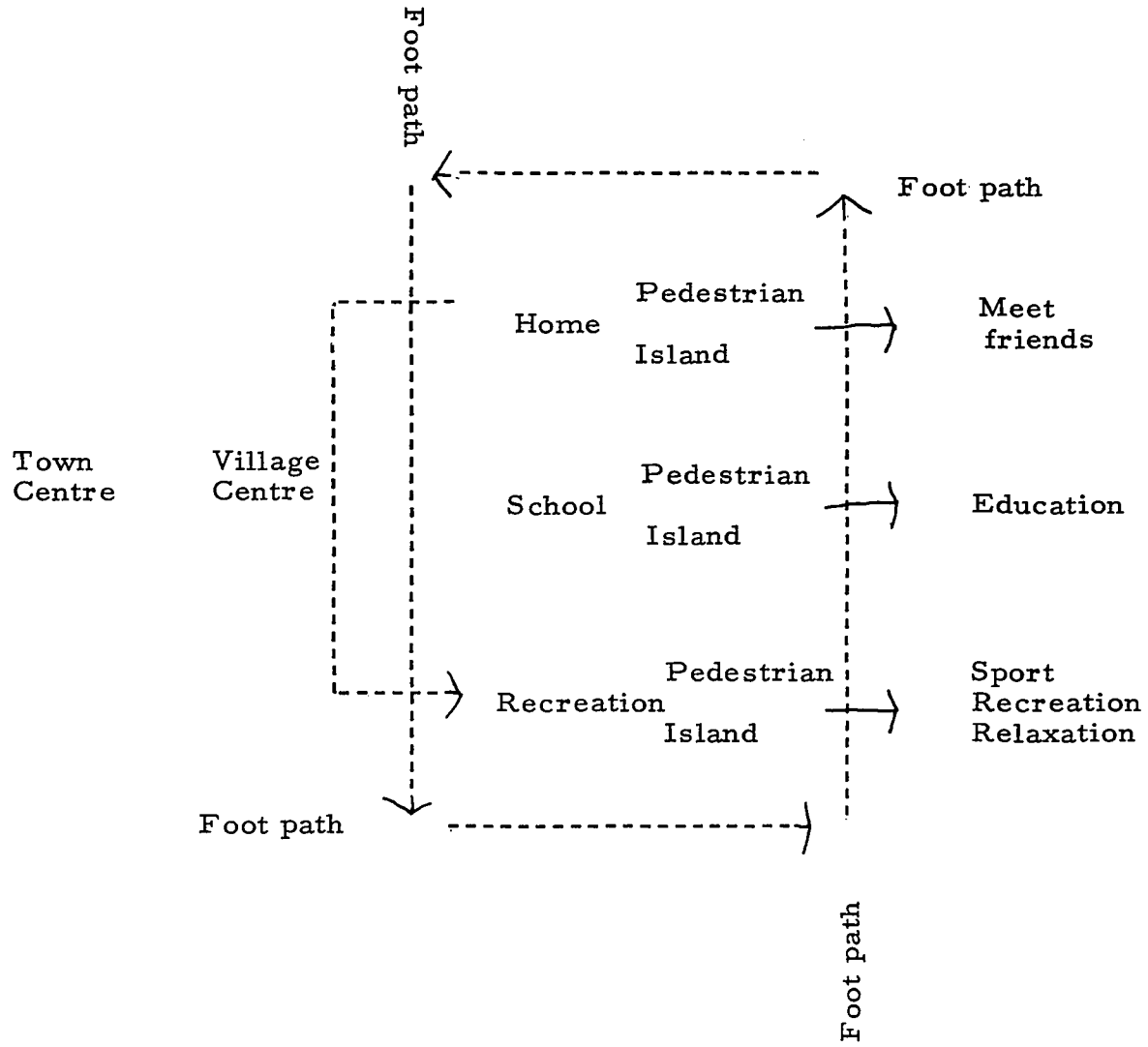
[4] Designing Inter-City Growth. Progressive Architecture. August 1962. P 102

field, the gymnasium and the tennis court. And shopping as presently developed, occurs in a pedestrian island. Now all these pedestrian islands which are the terminals of our vehicular transportation routes are all the good things of life. All of our social life, our recreation, and our education occur when we are outside of vehicles, during that portion of our life in which we are within pedestrian islands. So it seems quite logical that, in planning for a modern community, we should try to maximize the opportunity of being a pedestrian, for all the people of the community we should enlarge these pedestrian islands as much as possible". According to the norm they set up, the seven villages are linked together by walks, bicycle and bridle paths, while a network of auto roads serving the villages is separated from the pedestrian paths.


Foot path
Foot path
Pedestrian
Home
Island
Meet
friends
Town
Centre
Village
Centre
Pedestrian
School
Island
Education
Pedestrian
Recreation
Island
Sport
Recreation
Relaxation
Foot path
Foot path

HOOK

CONCEPT:

Examining the fundamental requirements of planning the new town in Britain, there are four principles recommended in the report of the London County Council as follows:

1. Urbanity.

   The town should have a coherent structure easy to understand.

2. The motor vehicle.

   The town must be designed to meet estimated future demands of vehicle ownership and car usage. An independent main pedestrian circulation system has been designed to extend throughout the town.

3. Town and countryside.

   The town should stand out distinctly from the surrounding countryside and yet be complementary to it. It is not so much a garden city as a city in a garden.

4. Population balance.

   Every effort should be made to achieve a balance of population in relation to age groups, family structure, and employment, in order to avoid second generation problems.[1]

---

[1] The Planning of a New Town.
Greater London Council 1965. Ch. 2, Pp 16-17

In order to attain the needs of urbanity, the idea of separate neighborhoods within the inner town was rejected in Hook. Instead, a centralized town with a linear central area at its heart, was conceived as the dominant focus of the town's social, business, and intellectual life.

Right from the beginning, one of the main aims of Hook was based on 1.5 standard of car ownership per family. Like Cumbernauld, Hook attempted to solve the conflict between man and motor car. The highest practicable degree of pedestrian and vehicular separation must be achieved to establish a 'traffic safety' town. As the report described it "For the most part, separation in the plan is horizontal; but in the central area where car parks are covered, separation is vertical."

It seems the linear town rested its contribution to efficient transportation. The reason to shift from a radial centripetal system to a system of linear development is to achieve a high accessibility. The expansion possibili es of the basic linear form still holds an attraction for many planners in more recent decades. Nevertheless F.G. West (Deputy Architect) stressed one point: "That the whole effort was based absolutely on a first sociological analysis. In no sense is this a preconceived aesthetic idea of what a town should be, superimposed on the landscape without any particular regard to the human and sociological problems which have to be satisfied". [2]

---

[2] New Town Development: The Hook Study. RIBA Journal. February 1962. P 46.

As a theoretical statement of new town planning principles, Hook had a tremendous influence all over the world since 1961. In describing the design criteria, the application of sociological analysis, Hook has many values to be learned.

SIZE AND DENSITY:

Hook was planned to be a new town of 100,000 inhabitants in North Hampshire between Basingstoke, Farnborough, and Reading. The town is four miles long and two miles wide. It lies north-south, across the main axis of regional and national communications, with the residential areas sited on the higher ground.

According to the provisions of the master plan, the residential structure is grouped into four main zones with respect to its own characteristics of social content. These are:

1. Central Residental Zone. This zone has 15 per cent of the population with an average family size of 2.3 persons and a net density of 100 persons per acre. It is conceived as an integral part of the central area complex. Containing the form of four to six storey dwellings, it plays an important part in the creation of urbanity.
2. Inner Residential Zone. This zone contains 45 per cent of the population at a net density of 70 persons to the acre, with an average family size of 3.2 persons. Dwellings

are between one and three storeys within a half mile walking distance of the central area.

3. Outer Residential Zone. This zone absorbs 30 per cent of the population at 40 persons to the acre. It contains larger houses for families of average size of 3.7 persons and would be outside the half mile limit.

4. Special Residential Groups. These contain some 1,200 small dwellings in high or special blocks at high density of 100 persons per acre with an average family size of 1.8 persons located at strategic points.

The studies for Hook were based on (i) the projection and analysis of population structure (ii) the desire to achieve compactness and coherence within a ten-minute walking distance of the linear centre and (iii) the solution to the problems of pedestrian-vehicular segregation.[3] In accordance with these studies, the size of the residential unit was conceived to be roughly 1/2 x 1/4 mile or 80 acres for 4,000 to 5,000 persons, including space for primary school and social buildings. In fact, this module was taken from the Radburn system and varied the size of the superblock.

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[3] Ibid. P 35.

TABLE 6

LAND USE ACREAGES AT YEAR 50 - HOOK

Item	Acreage
Central Area	100
Residential Areas[+]	2,018
Neighborhood Sub-centres	20
Hospital	30
Recreational and Open space	1,840
Schools (playing fields)	180
Roads, roadsides and railway	1,269
Industrial Areas	566
Agricultural Areas	1,028
Other uses	475
Total	7,526

+	Central Residential area	151 acres
	Inner Residential area	771
	Outer Residential area	1, 044
	Special Housing Groups	52

Source: The Planning of a New Town. P 44

ELEMENTS:

Dwelling Units

In the inner residential zone there are many housing groups. Each group consists of some 100 dwellings of the 385' x 660' module. The 20 per cent of the homes which are off the ground include some small flats and upper maisonettes in a couple of blocks of three or four storeys. These will give variety to the skyline.

In the central area the buildings rise four storeys above the shops. These blocks are maisonettes with central access corridor plans. Open access balconies are eliminated and high densities are achieved without the general use of lifts and sacrifice of space between buildings.

Schools

In the educational program at Hook the provision of schools is to provide the right number for the school-age children during the development of each stage. There are 23 primary schools on the basis of one school to every 4,300 people (residential module), each located on the main pedestrian way where children could go safely, less than a quarter mile from their homes to the schools.

Fourteen secondary schools are proposed, the equivalent of one school to every 7,100 persons. Each school is located on a main town road in relation to the forms of adjoining housing and landscape. Students would walk from home by the underpass beneath the main roads to schools.

In addition, fifty nursery schools are proposed on the basis of one school to every 2,000 persons.

Shops

It seems that the tendency of retailing is in favor of centralization with a series of shopping centres. In Hook, the shops and shopping street above the surface of the deck are prepared to allow for the changing character of modern retailing. Meanwhile the layout of the core of the central area is designed to accommodate them. One point is worthwhile to mention. Mr. Graeme Shankland said: "This need for change and flexibility in the central area is vital. In old towns it has to struggle against the permanence of buildings and the rigidity of road layouts and property boundaries". [4]

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[4] Ibid. RIBA. P 74.

Centre

"The central area serves three populations, acting as a regional centre, as the main centre for the whole town, and as a local shopping centre for the residents of the inner town". The climax of the whole town in both the social and architectural sense is the central area. "It is planned on two main levels: the upper pedestrian shopping level 20 feet above ground level, and the lower level for vehicular traffic, parking, and serving".[5] The connection between lower level and pedestrian deck are by lifts, escalators and stairs.

Of particular interest is that the deck is extended into residential areas and connected with the pedestrian network. In the report, the cross section shows how a series of intermediate levels, varying the space, links the central shopping platform and high density housing zone.

The central area occupies 100 acres, roughly a mile long. Parking spaces are provided for 8,150 cars (56 acres of land), the ultimate figure during a shopping peak period. Moreover, it would be developed by three stages and be programmed to start in the north, then extend southwards.

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[5] Ibid. RIBA. P 74

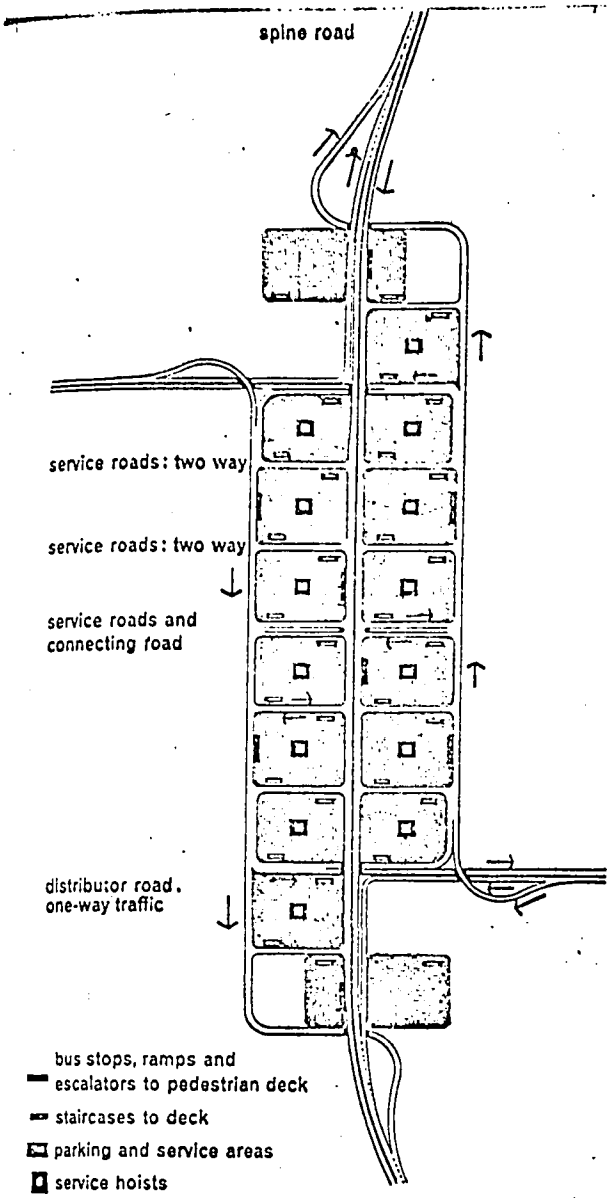
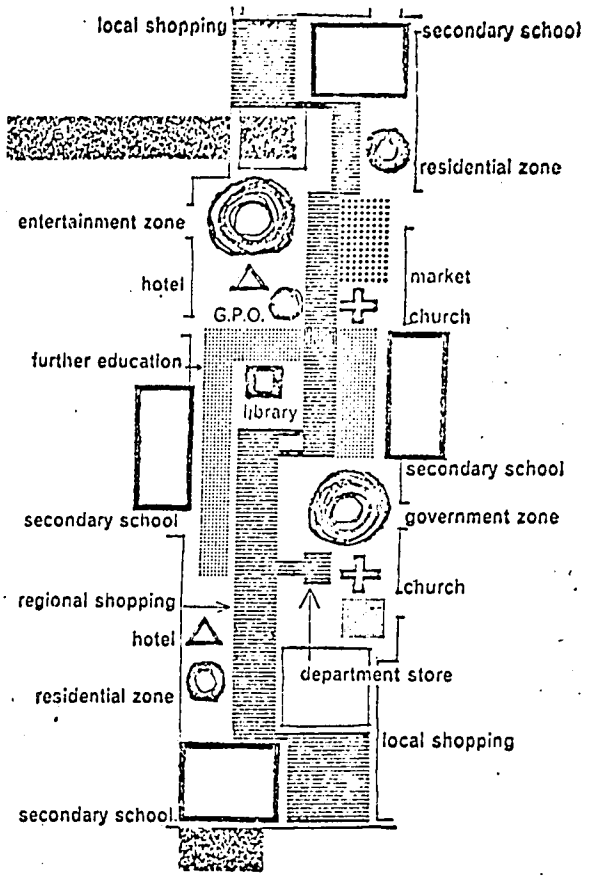


FIG 28

Ground level road and servicing systems in the central area



Major use zones on pedestrian level

FIG 29

Open Space

To follow the third principle discussed previously, the major open spaces form a continuous green belt around the whole town to define the built-up edge. It is different from the practice of housing open spaces to separate neighborhoods. These spaces are laid out along the Whitewater valley.

The 'town fields' contain a four-mile long park with the stadium and a chain of lakes. It is proposed to incorporate the 140 acres of secondary school playing fields and 600 acres of adult playing fields (6 acres to every 1,000 persons).

ARTICULATION:

The provision of major roads and minor public roads are classified by primary function into three groups:

1. National roads - these are motorways for medium and long journeys on truck routes.
2. Regional roads - these are primarily for journeys between neighboring settlements and to provide links between the town and the motorways.
3. Internal roads - these are for internal circulation within the town. They consist of town roads (major arteries within the town), distributor roads (in residential areas,

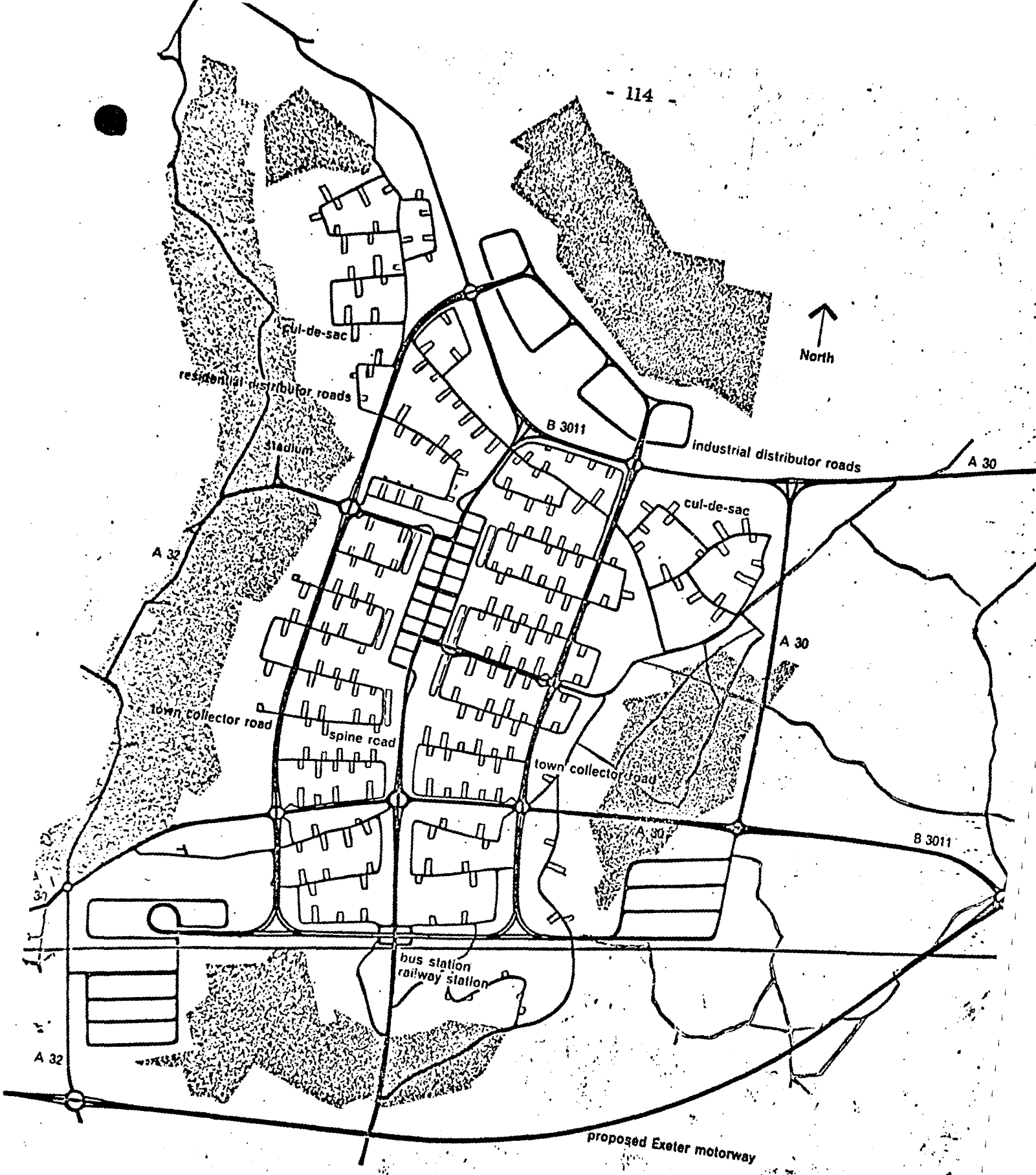


Fig 30. Road Plan of Hook.

industrial areas and central areas), and service roads (from which access to property is gained).[6]

The road plan is designed to avoid the mixture of regional roads and town roads. They usually act as the same in existing towns. In fact functions, access points and design speeds are varied. The two different types of lines have to bring those factors out clearly.

In addition to the provision for the motor car, a comprehensive system of pedestrian ways was conceived. Since most of the population live within walking distance of the central area, "the pedestrian ways take on a special importance".

The network of pedestrian ways runs throughout the whole town. It links town centre to open space and open country, home to primary school, corner shop, neighborhood centre and bus stop.

It is assumed that about 11 per cent of the total population will be served by buses for commuting from home to work. A bus service is operated on the spine road and around the residential areas for the people who do not want to drive or who do not have a car.

Paul Ritter has commented on the plan of Hook; he said: "The Hook project demonstrated that, given the need to bring thousands of cars into a centre, a valley is a good site for the centre because the vehicles can be hidden in it cheaply and easily (unlike

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[6] Ibid. P 80.

Cumbernauld's excavation). This seems to have general relevance to the selection of sites for future new towns and was foreshadowed in the use of a valley in the centre of Farsta for a service loop".[7]

On the contrary, Colin Buchanan questioned: "The Hook scheme provides a good demonstration of the working of the 'law' referred to in Chapter 2. High environmental standards, with great convenience and pleasantness of scene for pedestrians, were initial objectives. Consequently, in order to secure a high level of accessibility complex architectural and engineering forms are required at high cost".[8]

Nevertheless, the Hook study has been a big jump forward. Its valuable contribution is not only for England. When we are seriously concerned about the future of town development, no matter what kind of alternatives we are going to conceive, it would be inevitably influenced by Hook to a certain extent.

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[7] Paul Ritter. Planning for Man and Motor. Pergamon Press 1964. P 122.

[8] Colin Buchanan. Traffic in Towns. Penguin Book S 228, 1963. P 207.

SUMMARY

The Radburn idea was derived from Ebenezer Howard's Garden Cities and from Perry's version. The transformation of the Radburn idea has been revealed in many examples we observe. Generally speaking, the application of superblocks was adopted as a tool in seeking an organic pattern for a better living.

After the second world war, the concept of neighborhood cluster was applied in Harlow. In the comprehensive approach of neighborhood planning, there are four neighborhood clusters grouped around three cluster centres, with the town centre serving for the fourth centre.

A flexible method for programming development of residential neighborhood units was planned and designed as a four-stage project for the new town in the wilderness. In view of the background and planning philosophy, the pattern of residential neighborhoods was affected by its chief planner - Clarence Stein.

The plan of Vallingby is a spider form with 10 major radials. The diversified dwelling groups are arranged within easy reach to create vital space for living environment. Since Clarence Stein worked as a consultant in the planning of Village, inevitably the principles of superblock and cul-de-sacs have been applied in setting up the form of new neighborhoods.

The admirable achievement of Vallingby is that the rapid mass transit system has been integrated with the core of Stockholm and revitalized the country suburbs.

According to the established thirteen housing categories, various dwelling units are developed from sector to sector in the Chandigarh plan. The grouping of houses, open spaces and bazaar street form the pattern of the neighborhood. Seven Vs create a flow of movement leading from sector to sector and organize the city as a wholesome diversity. For the symbolic purpose, the extravagant provisions of Chandigarh have failed in the planning solutions with respect to Indian economy, climate, and way of life.

In Hook, the loop, the superblock with its internal green areas and separation of pedestrian circulation, as well as central facilities programs, are all derived from the previous examples. The multi-deck principle of Hook was inspired by the centre for Vallingby. The neighborhood concept was modified in terms of human interaction, and the pattern of the residential model was formed to enable a great number of people to live within walking distance of a linear centre.

After examining seven examples of residential neighborhoods around the world, the evolution of ideas overlapped one by one. The important achievement of these examples is not the physical form in terms of aesthetic value, but the impact on planning. From their positive experiments emerge the deeper trends of residential development for the future.

PART III

WITH SPECIAL REFERENCE TO TAIWAN

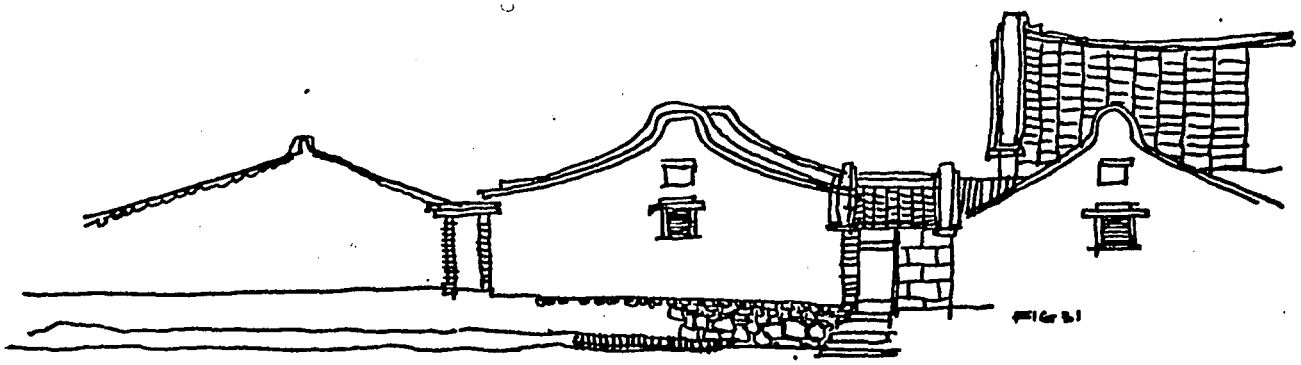
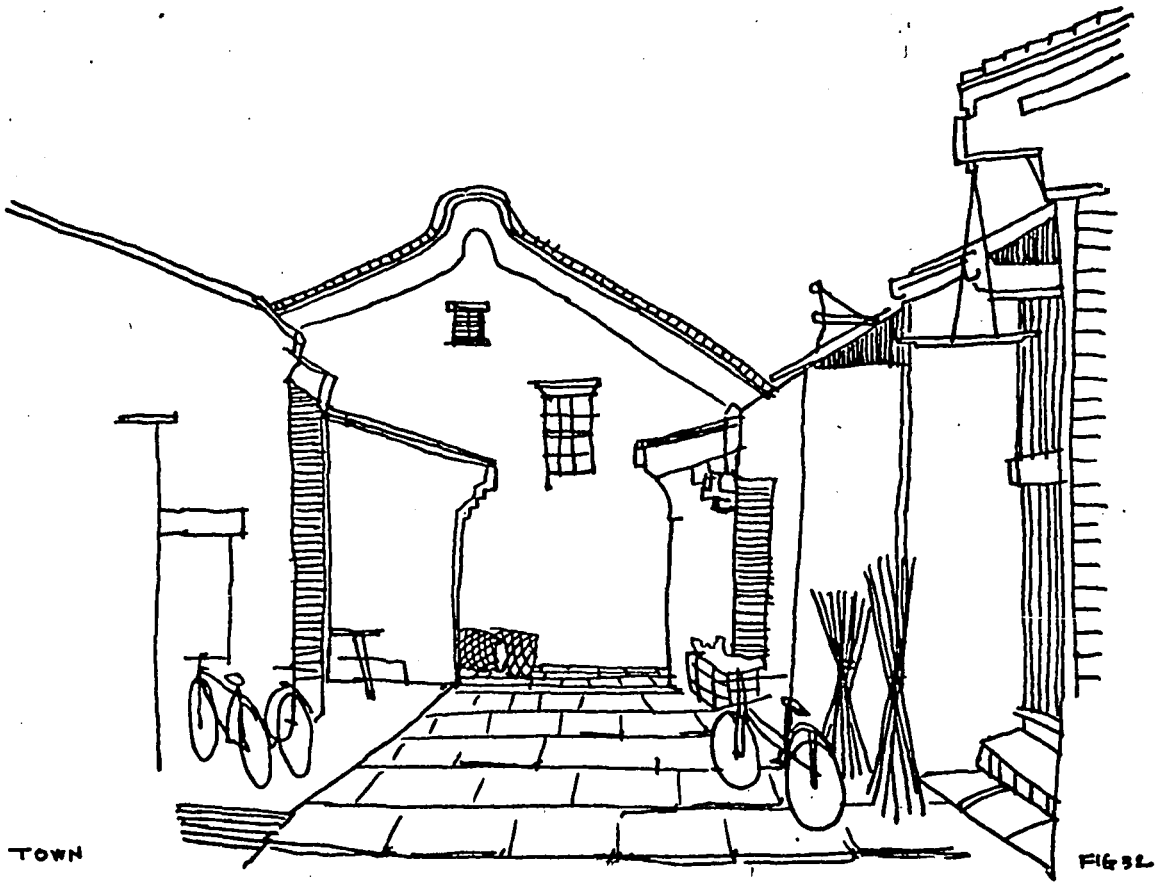


FIG 81

FARMHOUSE



TOWN

FIG 82

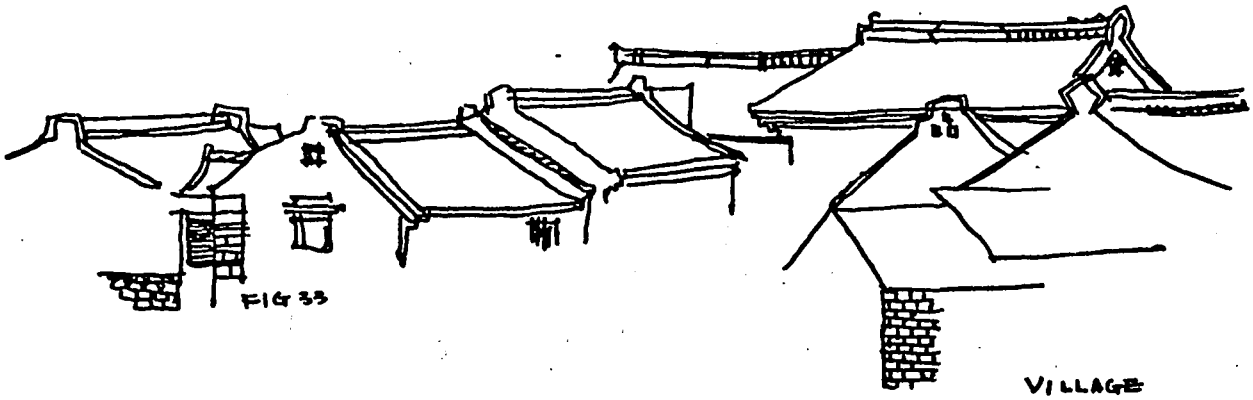


FIG 33

VILLAGE

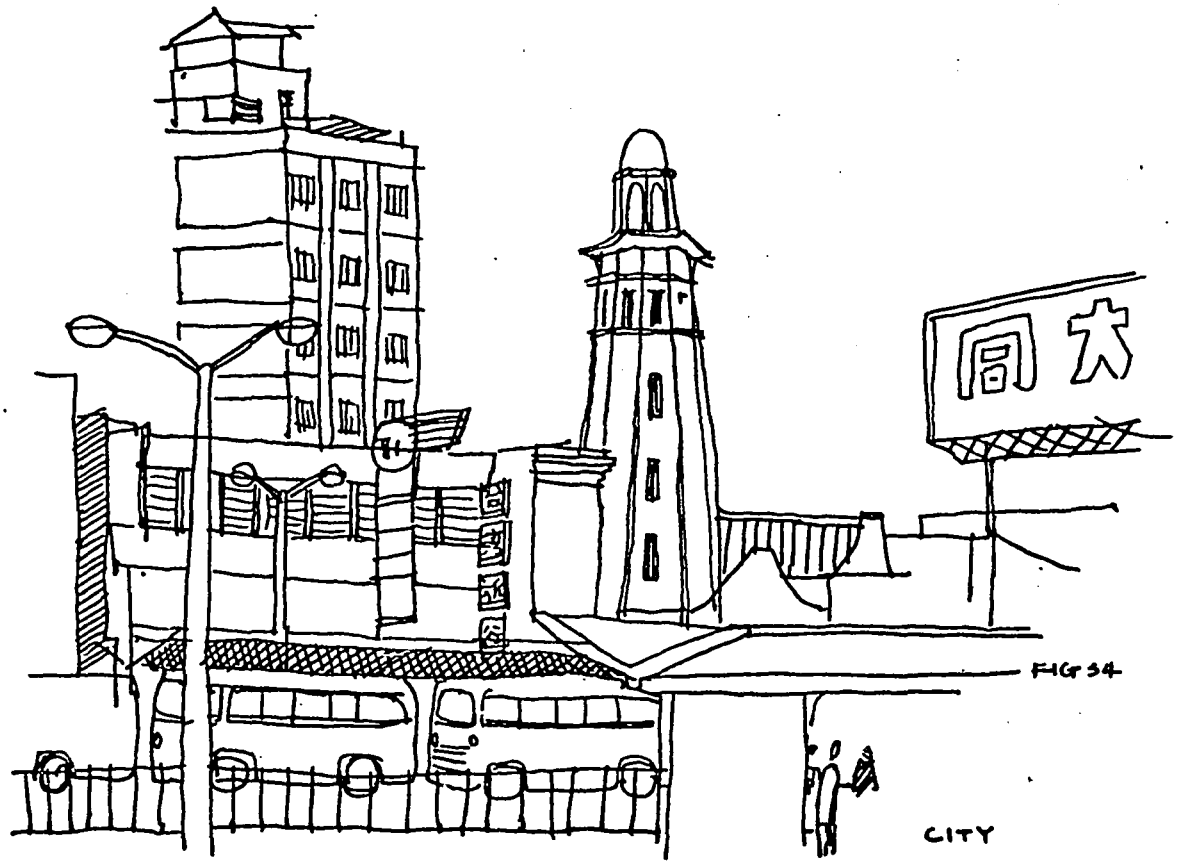


FIG 34

CITY

THE LAND

Taiwan lies 100 miles off the east coast of the mainland of China. It is about half way between Shanghai and Hong Kong, and midway between Japan and the Phillippines.

Taiwan is roughly a long oval in shape, approximately 240 miles long from north to south, and 89 miles wide from west to east. It covers an area of 13,885 square miles which is about one-half the size of Ireland, a little larger than the Netherlands, and about equal to Puerto Rico, Jamaica, and Hawaii combined.

Taiwan is a mountainous island; a range of mountains runs from the northeastern corner of the island to its southern tip. This central range occupies almost two-thirds of the island and has more than 50 peaks with elevations above 10,000 feet. In the east the mountains slope steeply toward the Pacific Ocean; west of the central mountains are found the foothills and tablelands and then a flat plain 9 to 18 miles wide.

Although the island of Taiwan is small, its landscape is greatly varied. The geographical region may be classified into five groups: (1) the northern hills and basins, (2) the southwestern plains, (3) the central mountains, (4) the eastern coast, and (5) the Penghu islands. Each has its own significant character of natural features within its boundaries and all are related as the integral whole.

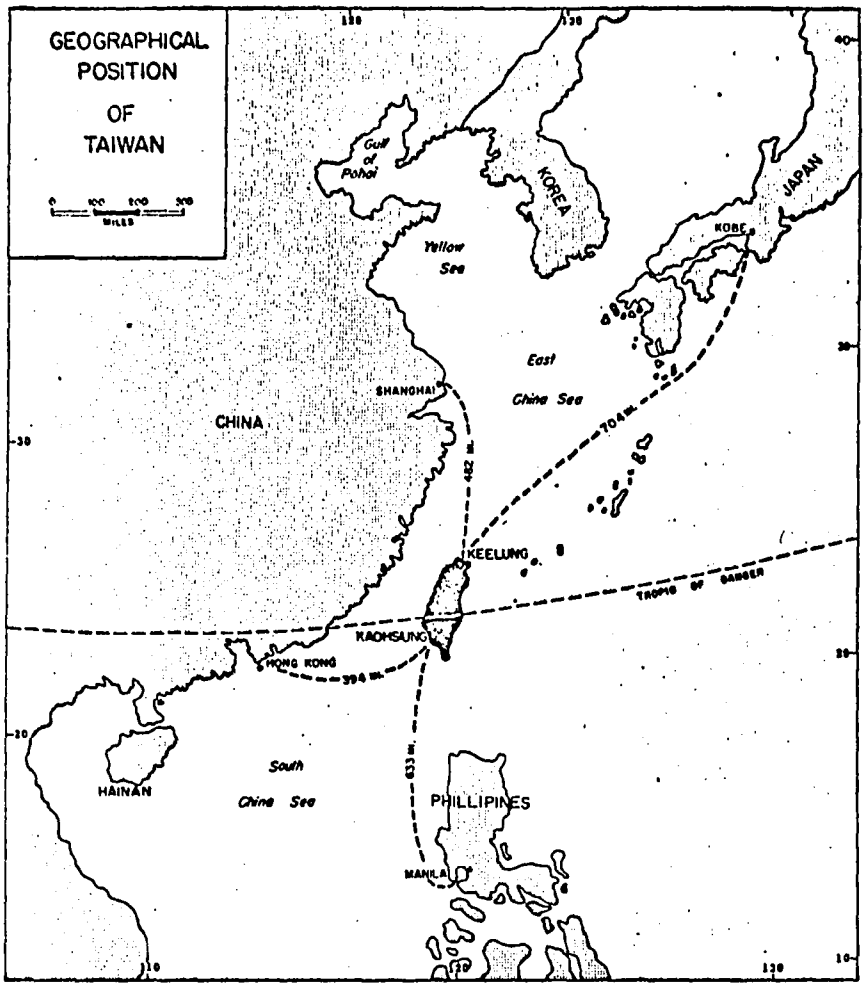

GEOGRAPHICAL POSITION OF TAIWAN
MILES
Gulf of Pohai
KOREA
JAPAN
KOBE
Yellow Sea
East China Sea
SHANGHAI
CHINA
KEELUNG
TROPIC OF CANCER
KAOHSIUNG
HONG KONG
HAINAN
South China Sea
PHILLIPINES
MANILA

FIG 35

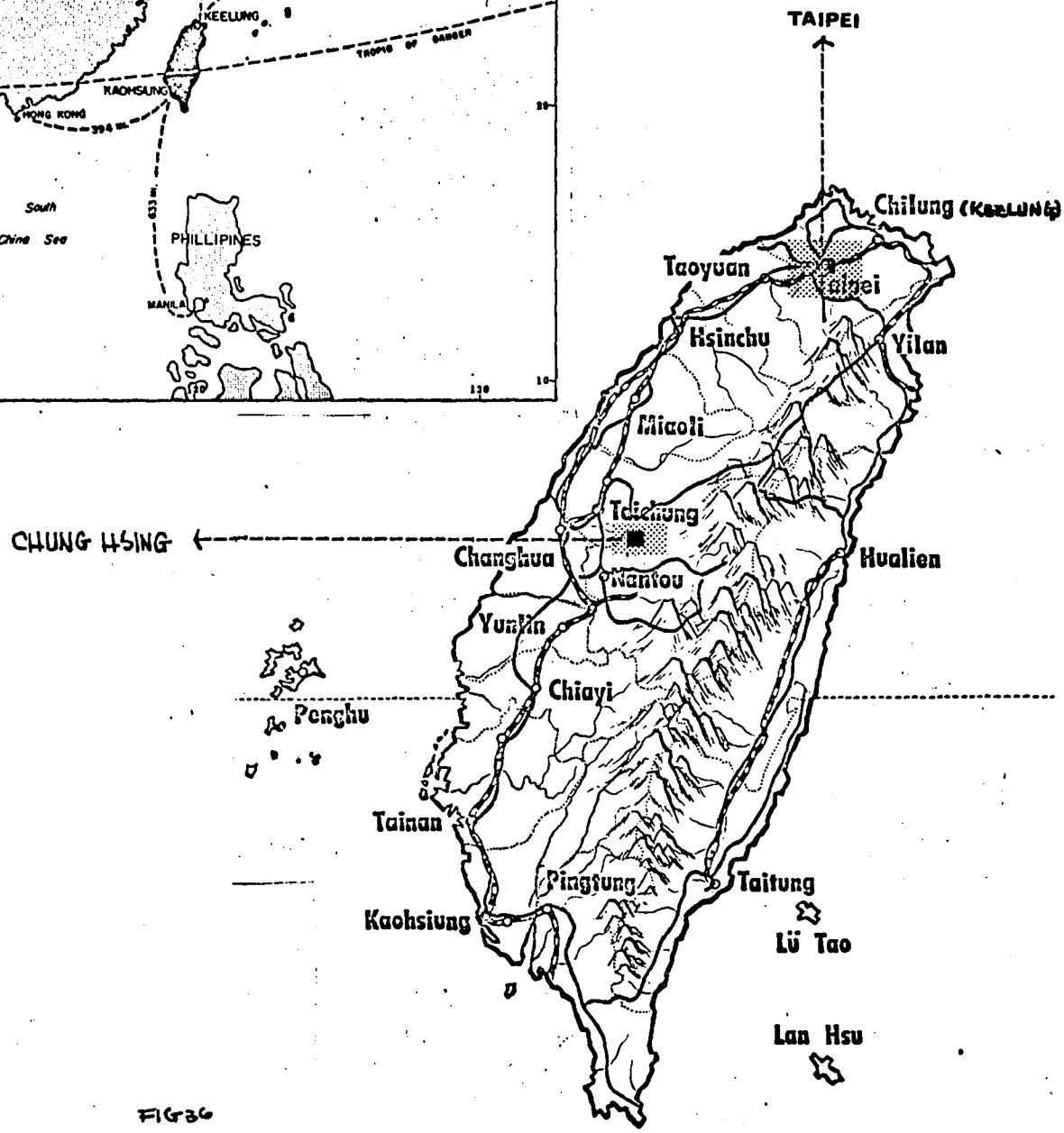

TAIPEI
Chilung (KEELUNG)
Taoyuan
Taipei
Hsinchu
Yilan
Miaoli
Taichung
CHUNG HSING
Changhua
Nantou
Hualien
Yunlin
Chiayi
Penghu
Tainan
Pingtung
Taitung
Kaohsiung
Lü Tao
Lan Hsu

FIG 36

The characteristics of the climate of Taiwan are high temperatures, heavy rainfall, and strong winds. The island's climate is influenced by the arrangement of its mountains, ocean currents, and its position relative to the Pacific Ocean and the Asian continent.

Summer in Taiwan is long and hot; winter is very short and mild. Throughout the island, the annual mean temperature is more than 70° F: a maximum temperature of 102.2° F. has been recorded. Snow is rarely seen in the lowlands and even the summits of the higher mountains are covered with snow for only a short time. Typhoons are violent and destructive, inflicting a terrible toll on houses, villages and human lives.

THE PEOPLE

The growth of Taiwan's population has been very rapid. The total population of the island in 1946 was 6,090,860, but it had jumped to 12,256,680 by the end of 1964. In a period of 18 years, the increase of population was 6,165, 820 and the overall density was 910 persons per sq. mile in 1965. Since two-thirds of the island are mountainous the actual population density is one of the highest in the world.

The most characteristic feature in the composition of the population of Taiwan is its youth who make up a large proportion of the total population (46% are under 15 years of age). Owing to the large-family tradition, early marriages and little or no use of contraceptives, the fertility rate of the island is very high. Now birth control has become a government policy.

The average rate of population growth is around 3.2% in Taiwan. The growth of rural areas is only about 2.5% while that of large urban centers is roughly 4% to 6%. This trend of urbanization is still continuing and will continue for some time. The emigrant population from rural areas is adult rather than young or aged, and more male than female.

The three factors of urbanization in Taiwan are:

1. Because of Civil War, many people come from all directions to Taiwan thus rapidly increasing the population. Between 1948 and 1949 the population increased by about 900,000. Evacuees from the mainland have to live mostly in the cities in order to earn a living.
2. In urban areas, the development of industries, commerce, political and economic activities, attract a concentration of the population.
3. A number of well-to-do people in the rural areas are attracted by the life in big cities and move into urban areas.[1]

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[1] "Housing in Taiwan". Public Works Bureau, Republic of China. May 1965.

THE EVOLUTION OF SETTLEMENT PATTERN

Before discussing further, it is necessary to note the sequence of the occupation of Taiwan. According to its historical background, the island has attracted various peoples including the Aborigines from the South Seas, the Chinese, the Dutch, the Spaniards, and the Japanese.

The various peoples settled in the island at different periods and obviously did not utilize the land in the same way. They built quite dissimilar houses and patterns according to their individual cultural customs and ways of living.

The primitive people followed the physical surroundings in forming their settlements. The landscape was later changed by those people with advanced technological skills. The influence of each different group left their mark on Taiwan.

According to the changing settlement patterns and the evolution of transportation, development and economic activities, there are five different periods of occupation in Taiwan:

(i) the period of the primitive aborigines,

(ii) the Dutch commercial period,

(iii) the Chinese agricultural period,

(iv) the Japanese pre-industrial period, and

(v) the period after the Second World War.

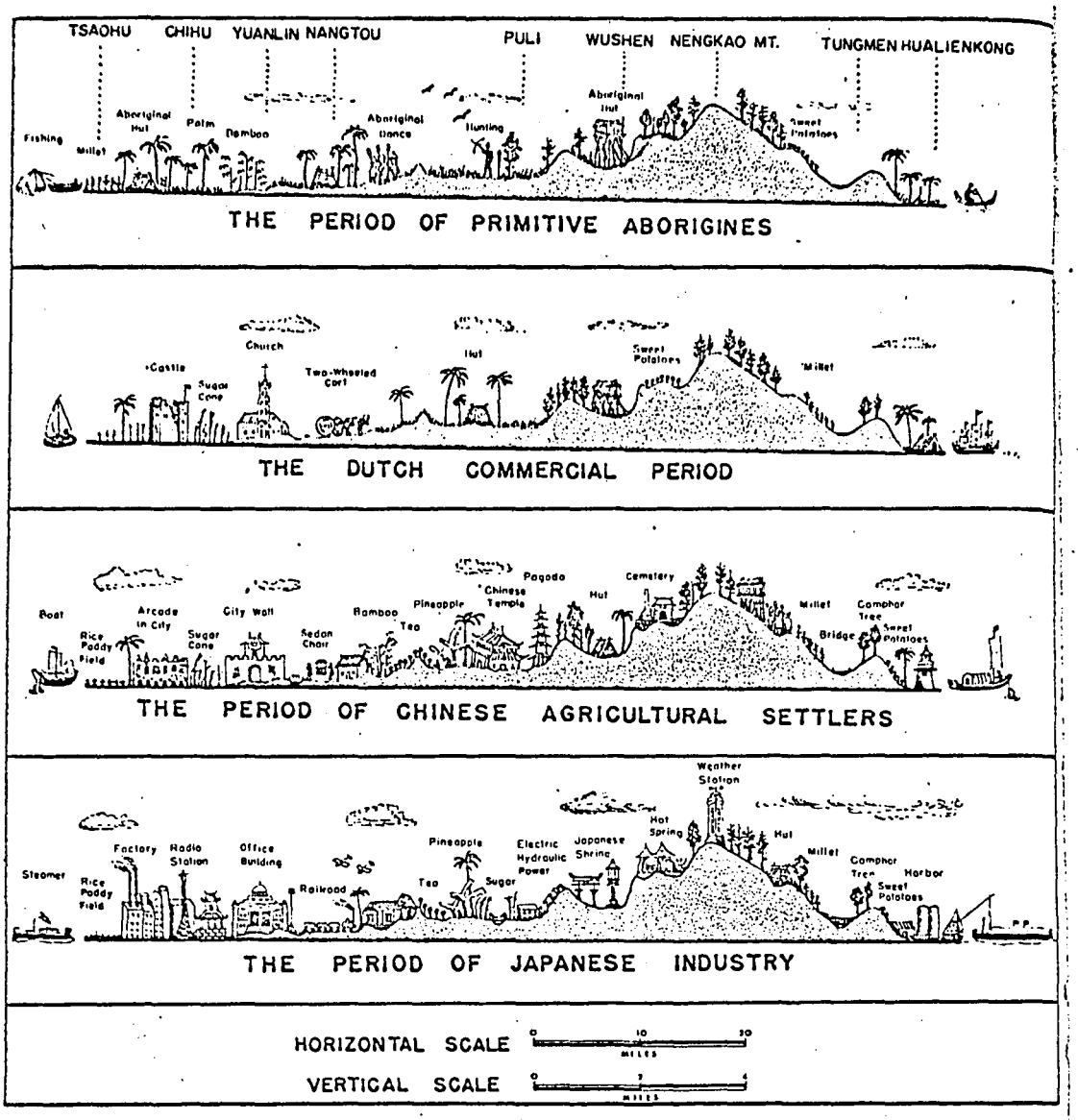


Fig 37. The Sequential Occupation of Taiwan..

Primitive Aborigines

From where did the ancestors of the modern aborigines in Taiwan come? It is still a question for archaeologists, but the shelters they have built are similar to those of the South Pacific areas. Due to their less developed cultural background, they have gradually moved away from the fertile plain to the steep mountains as the Chinese immigration took place.

Up to the present, there are seven tribes of modern aborigines in Taiwan: the Ami, Yami, Taiyal, Saiset, Tsou, Bunun, and Paiwan. About 200,000 in population, they are relatively primitive and live within their own settlements. Except for the Ami who live on the eastern foothills, and the Yami who inhabit Lanyu Island off the south-eastern coast, the other five tribes are mountain dwellers.

Most of the modern aborigines live in the interior of the Central mountains. Their means of transportation is rather primitive, as they do not have wheeled vehicles and just move about on foot.

Since they rely on primitive techniques for hunting, fishing, and farming, their living standards are generally low. The size of the aborigines village ranges from 100 to 500 persons. The location of the village is on the mountain or the steep hillsides. Their settlements are scattered in the north and fixed or compact in the south.

The shape of the aborigines house or hut is usually square or rectangular, with flat roof, bamboo wall and dirt floor, high above the ground. Their houses have no windows and are of extreme substandard construction.

European Rule

Taiwan was under the jurisdiction of the Dutch East India Company from 1624 to 1662. The Dutch introduced agricultural technology to cultivate the farms with sugarcane, wheat and tobacco. They established a base near present day Tainan. It was about this time that the Dutch came to New York, then called New Amsterdam. In 1626, the Spanish landed at Keelung and stayed for 15 years. The Dutch drove the Spanish off the island in 1641.

Koxinga took Chinese troops from Fukien to Taiwan in 1661 and re-took Taiwan to end Dutch rule in 1662.

During the era of the European influence, Spanish castles and churches were built in Taiwan. Since colonization by the Dutch and the Spanish was temporary no definite European pattern of settlement developed in the island.

Chinese Agricultural Settlers

The Chinese came from the provinces of Fukien and Kwangtung as early as the 12th century. But the flow of immigration increased after 1662.

In traditional Chinese society, the family is the important social unit: the individual is subordinated to the family group. Since the Chinese worship their ancestors instead of gods, the joint-family system influenced the types of dwellings which were introduced to the island by the immigrants from southern China. According to the

hierarchy of the traditional Chinese family, all generations live together but each generation lives in a separate part of the house. The head of the family is the father of the oldest generation. He is the authority in the family and all generations follow his instructions.

For the large family system the walled house enclosure, with one or more courtyards, was developed. The characteristic feature of this type is that many compartments can be increased by adding rows of housing units to the existing group. It also provides the flexibility for the growth of a traditional large family in the rural areas.

During this period the pattern of settlement was predominated by the rice fields. It was quite distinct from the North American farm pattern. The rice farms were very small, seldom covering more than 5 acres and divided into irregular plots.

There were two types of settlements in the rural areas - the dispersed type in the northern part of the island, and the compact type in the southern. Aside from these two types, some groups of rural houses were developed in a linear form along the banks of the river or on the natural levees. The rural houses are connected by the narrow ridge between paddy fields, while the village is frequently enclosed by a bamboo hedge.

Japanese Occupation

Taiwan was ceded to Japan as a result of the first Sino-Japanese war under the Treaty of Shimonoseki of 1895. During the period of the Japanese occupation, Taiwan served as the source of agricultural products, the market of industrial products, and the living space for overpopulated Japan.

In this pre-industrial period, harbors were built to improve sea communications between the island and Japan. The railroad and highway were developed to establish a network throughout the island.

Since most of the government organizations were established in the urban areas, Japanese immigrants were concentrated in the big cities. Consequently, the Japanese settlement was superimposed upon the Chinese pattern in the urban area.

The traditional Japanese houses use 'tatami' - straw mats covering the floor of the room as the module of the dwellings. The size and plan of the house are determined by the arrangement of tatami. The interior space is divided by 'fusuma' (paper-covered wood-frame sliding doors). In comparison with other types of dwellings, the Japanese house has high flexibility in combining adjacent rooms by the removal of partitions. But in this house one must discard his footwear to sit and sleep on the matted floor. This mode of living is quite different from that of the Chinese.

The Chinese house is made of brick, clay and stone, while the Japanese house is made of wood, grass and paper. From 1895 to 1945 the Japanese had controlled the island for 50 years. They built Japanese houses for government officials and they also constructed public buildings such as government offices, schools and railway stations.

In Chinese, the word for 'city' and 'wall' has the same meaning, because the traditional city was walled. The wall was not merely for the purpose of political organization, it was also for defence. The Japanese thought it was not necessary to retain this kind of city form so they demolished the wall and preserved the Chinese city gates as historical monuments.

From the first large numbers of Chinese settled on the island to the end of the Japanese occupation. The Chinese old farm-house tradition remained in the rural area while new materials and methods of construction were mixed with the Japanese influence in the cities.

THE RECENT PHYSICAL ENVIRONMENT

The Old versus the New

Under the present administration Taiwan has 16 Hsien (counties), one special city - Greater Taipei (the capital), and four municipalities. There are ninety urban units, each of which has a population above 2,500 persons. Most of the cities and towns are located on the western plains of the island, extending the settlement pattern from north to south.

A village is usually formed by a cluster of Chinese farmhouses which are rectangular units enclosed by walls. The village is composed of one major courtyard with several minor courtyards and surrounded by a thick bamboo hedge.

The houses in a small town are all much alike. The location of the temple is not like the western mediaeval churches, as a focus of the main axis; the temples are often sited in the foothills or scattered within the town. The street pattern of the town is not a rigid grid, but formed by the row buildings with similar facade or arcade. The depth of the lot is much longer than the frontage, thereby enabling some dwellings to have a courtyard in the middle. In the town most of the buildings serve a dual purpose, the principle of 'add on'. The shop occupies the front and the owner's family lives on the floor above the shops.

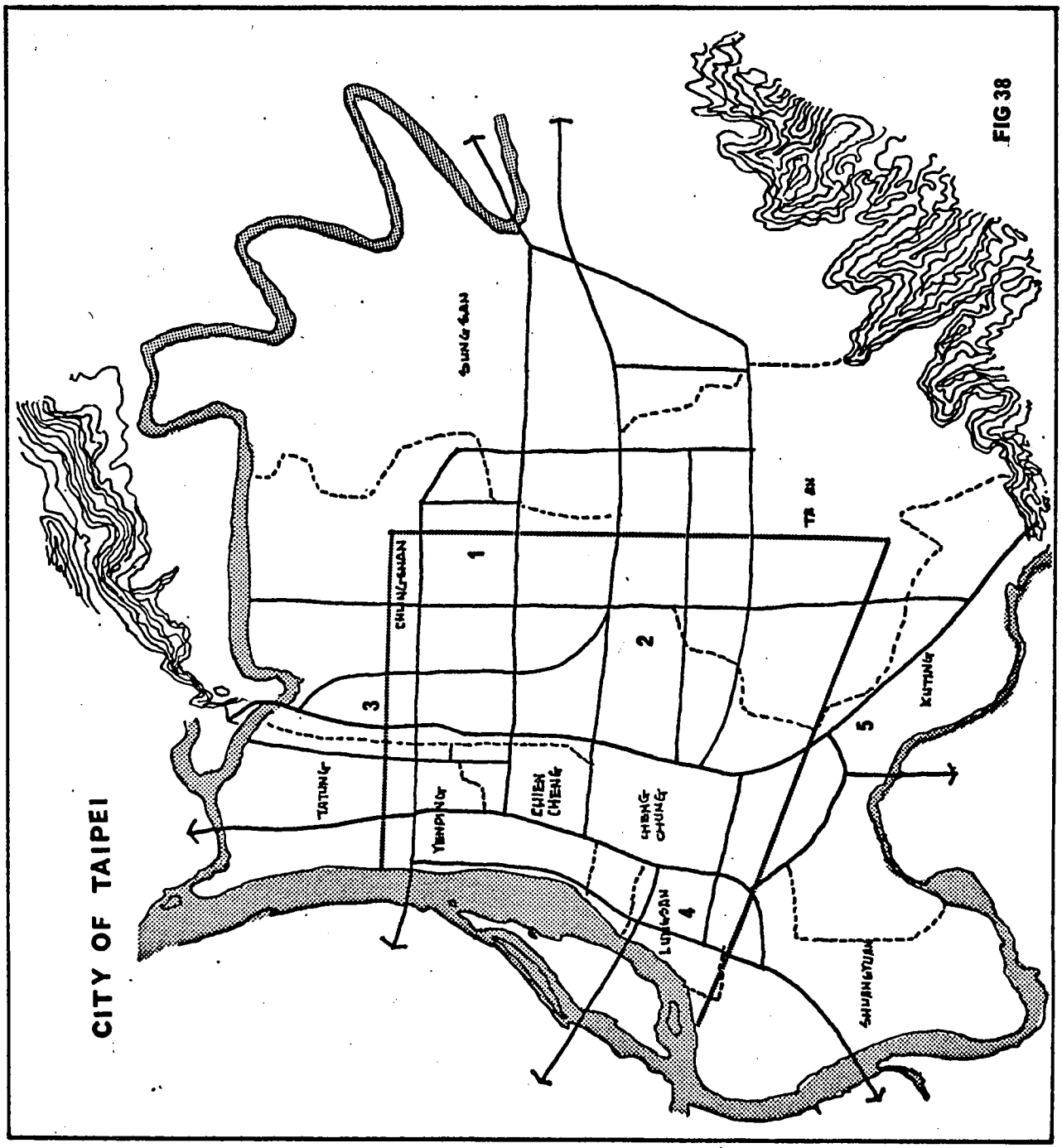

CITY OF TAIPEI
SUNGSHAN
TA AN
CHUNGSHAN
1
2
3
4
5
TATUNG
YENPING
CHIEN CHENG
CHUNG CHUNG
LUNGSHAN
KUTING
SHUEIKUTIAN

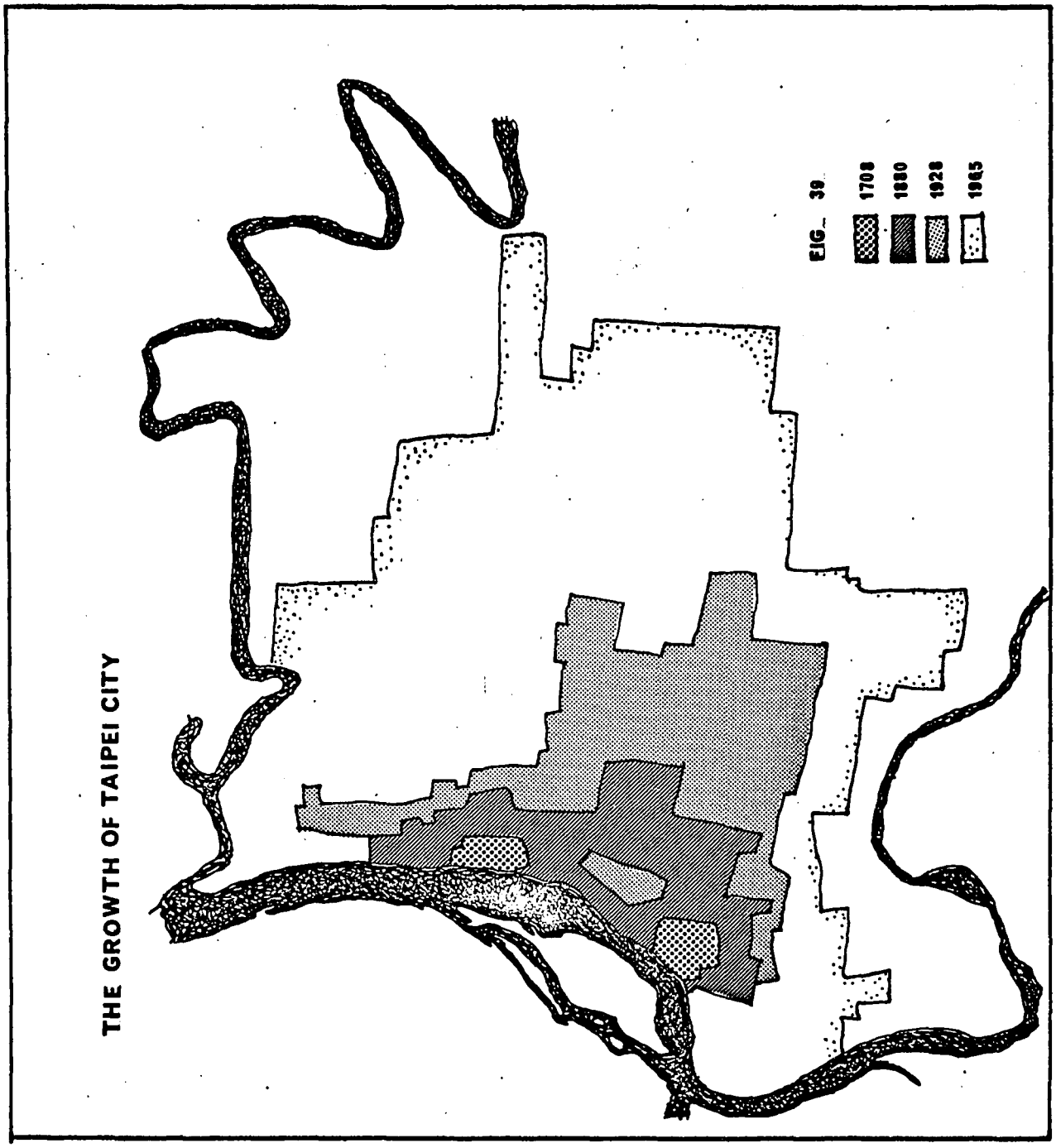
FIG 38

Taipei is located in the middle of the Taipei basin formed by three rivers, Tamshui, Keelung, and Hsintien. The original site of the city, Meng Chia, was a trading area for the Chinese settlers and aborigines. In the beginning of the 18th century the Tamshui River was the waterway from Taipei to the sea. Junks could reach Meng Chia from the mainland of China and the settlement was developed along the river side in the early days.

Since the silting up of the Tamshui River, difficulty in navigation caused a decline of the riverside area. The growth of Taipei expanded from the river to the eastern side. In order to connect the inner city and the outlet port - Keelung, the first railway was constructed in 1885.

During the period of the Japanese occupation, Taipei was the political center and capital of the island. The master plan for Taipei was made at that time. Even now, the city of Taipei is still following the old Japanese plan with slight modifications.

There are 10 administrative districts of Taipei City. These are: Sungsan, Ta-an, Ku-ting Shuangyuan, Lungsan, Chengchung, Chiencheng, Yenping, Chungsan, and Tatung districts. The greater part of the population increase has taken place in the Ta-an, Chungsan, Kuting, Tatung, Sungsan, and Hsuangyuan districts during the last fifteen years. So far those districts are relatively unsaturated, while the remaining districts of Yenping, Lungsan, Chengchung, and Chiencheng are already saturated.


THE GROWTH OF TAIPEI CITY
FIG. 39
1708
1880
1928
1965

Most suburban towns have an average rate of increase greater than that of Taipei city. The highest is Yungho, about three times the rate of increase of Taipei city; the next highest is Sanchung, more than twice that of Taipei city.

The population distribution in the city is very uneven, the highest density was 713 persons per hectare and the lowest was 40 persons per hectare in 1960.

The city of Taipei contains five zones: residential, commercial, industrial, mixed and agricultural zones. They may be grouped as follows:

(1) Residential zone -

North of Chungcheng road
West of Chungsan north and south road
South of Nanhian road
East of Chung Fa road

(2) Commercial zone -

Lungsan area
Chengchung area
Ribbon development

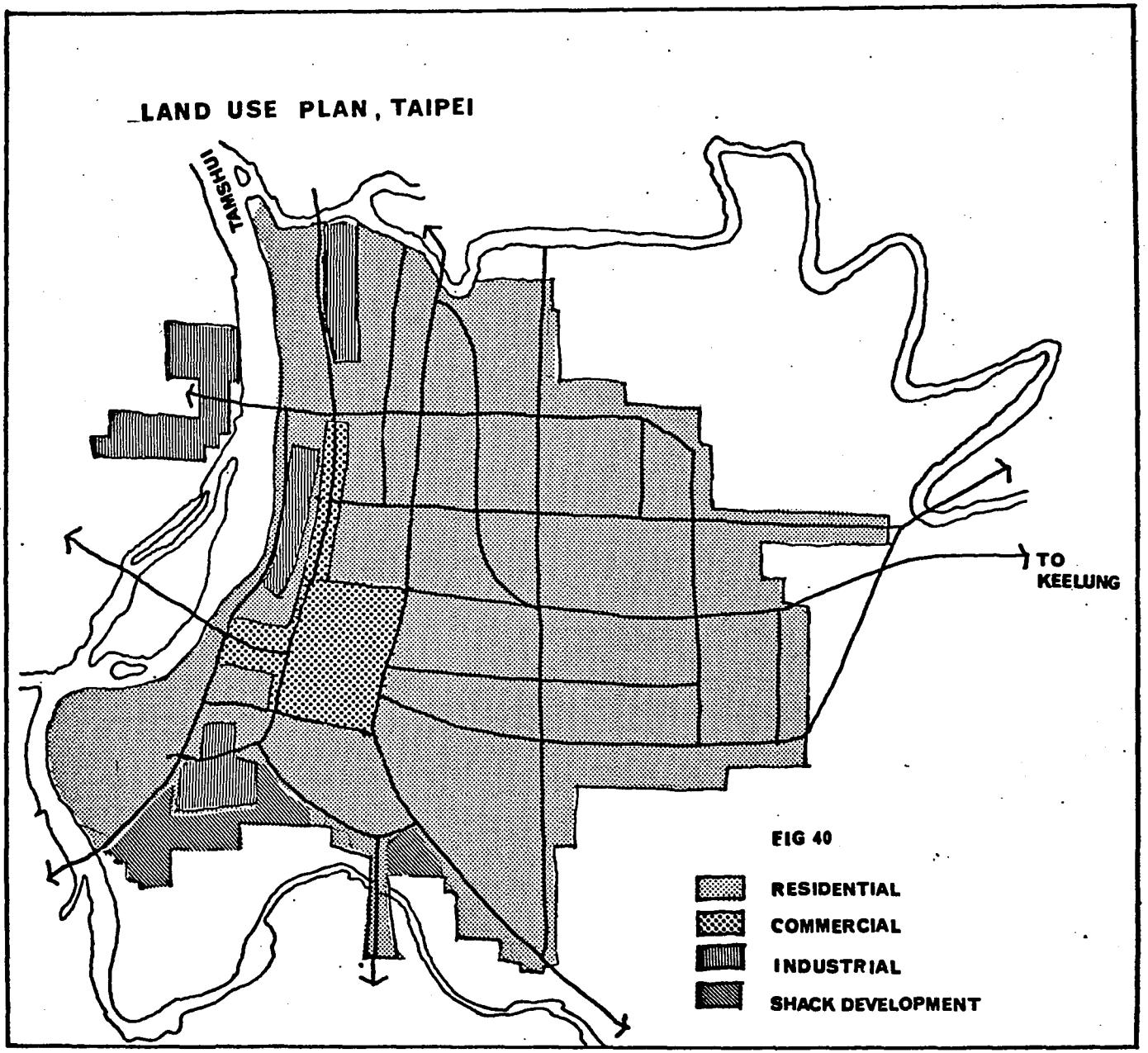
(3) Industrial zone -

Wanhwa and Tatung area
Hsuan Yuan area
Other small areas

(4) Mixed zone -

Yenping, Lungsan, etc.
Hsuan Yuan area
Others

(5) Agricultural zone


LAND USE PLAN, TAIPEI
TAMSHUI
TO KEELUNG
FIG 40
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
SHACK DEVELOPMENT

Generally speaking, the residential zone occupies the northern and western parts of the city; the commercial zone is roughly located at the central part of Taipei; the industrial and mixed zones have been developed in the eastern parts at the original site of the old city. The agricultural zone is on the fringe of the city.

Lacking comprehensive city planning, houses are built virtually back to back with a small drainage ditch between them, resulting in very little open space between the rear of the buildings.

The influx of the mainland refugees has caused a serious problem. It was estimated that 150,000 persons live in shacks and are squatters. The large shack clusters have appeared on publicly owned vacant land along the Tamshui, Hsintien Rivers and railway tracks, some are squeezed into odd pieces of land on the corner of streets. They are almost completely covered and the interiors are often dark, ill-ventilated and overcrowded.

To relocate the shanty areas and to rebuild, a series of ad hoc public and publicly-aided projects have been undertaken in the central areas. The recent structures are generally walk-up buildings, two to four storeys high. Most of them have arcades and shops on the ground floors to enable the occupants to make their own living.

Commercial activities comprise banks, department stores, movie houses, hotels, restaurants, trading companies and other enterprises. Taipei city has five public wholesale and nineteen public

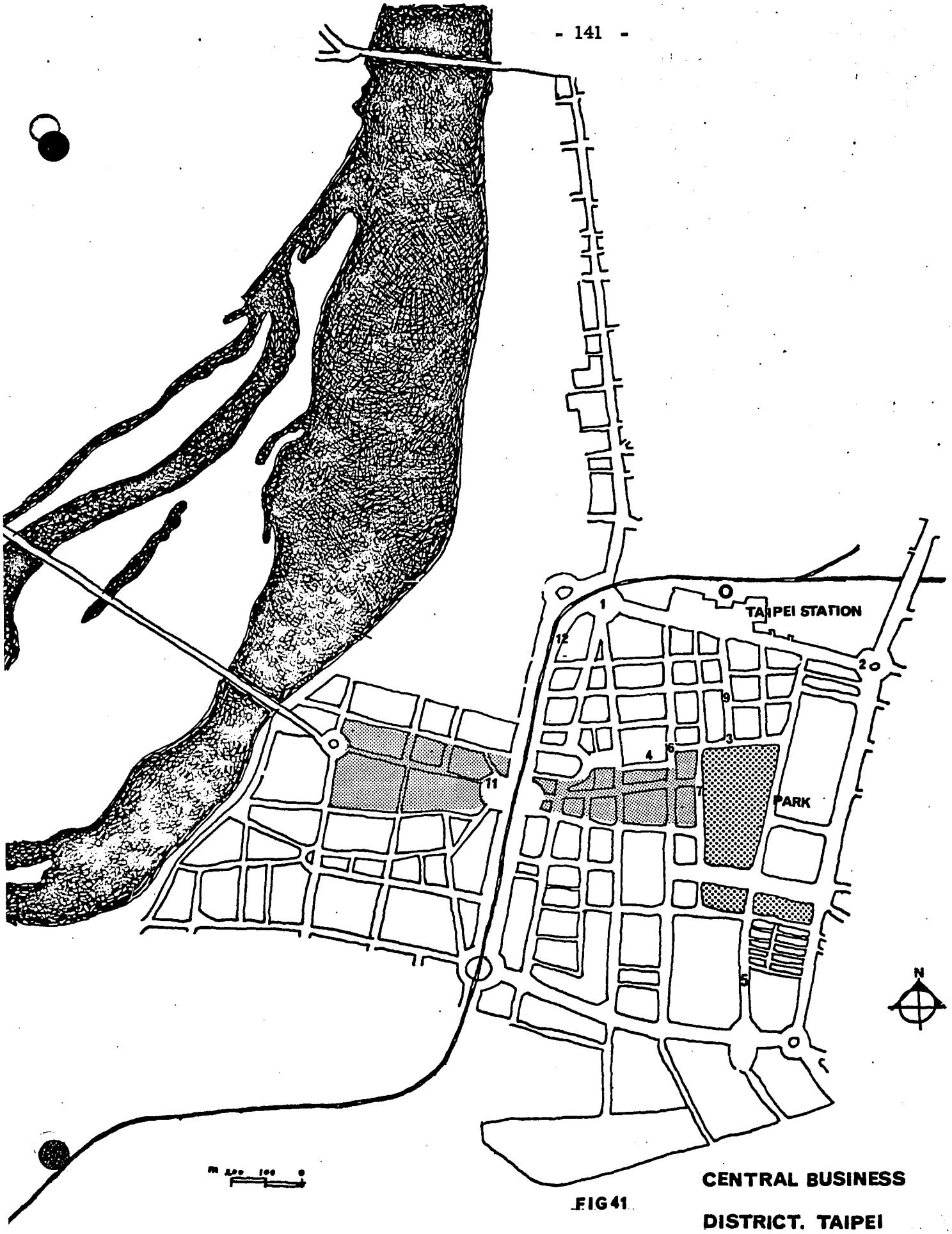
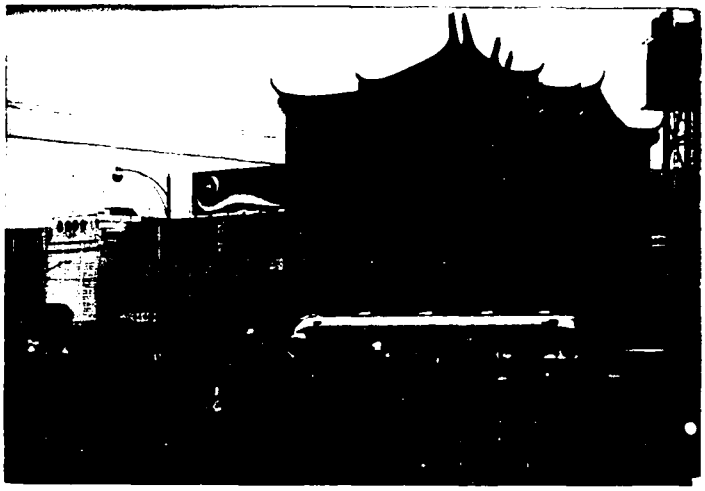
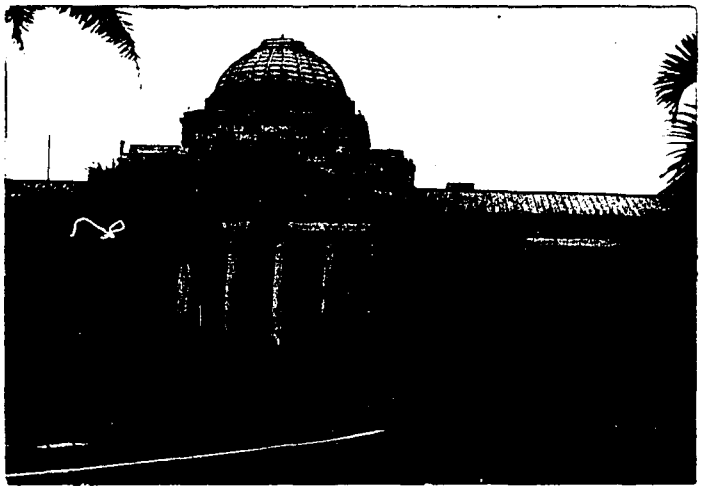
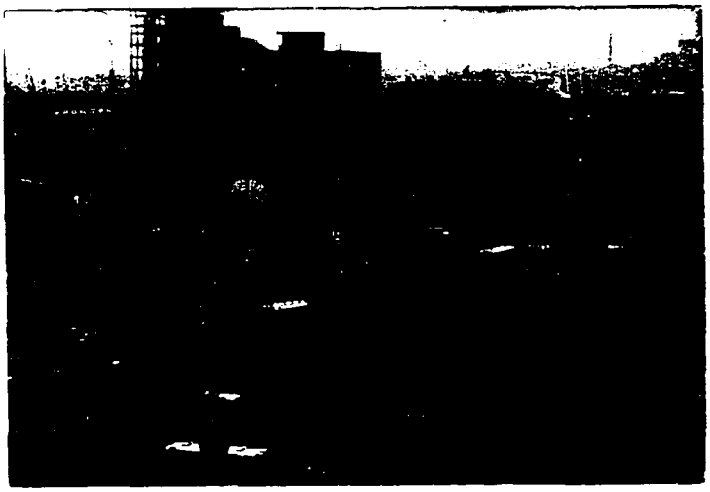
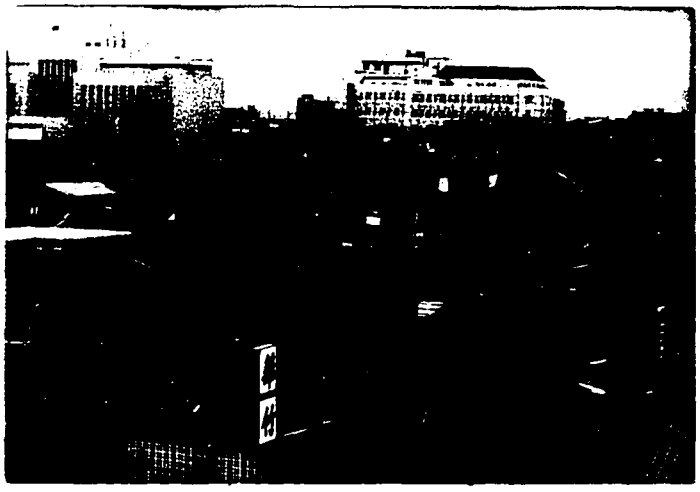


FIG 41 CENTRAL BUSINESS DISTRICT. TAIPEI

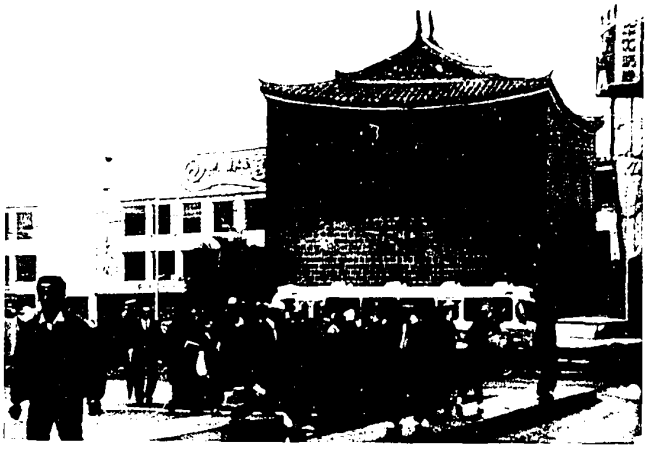


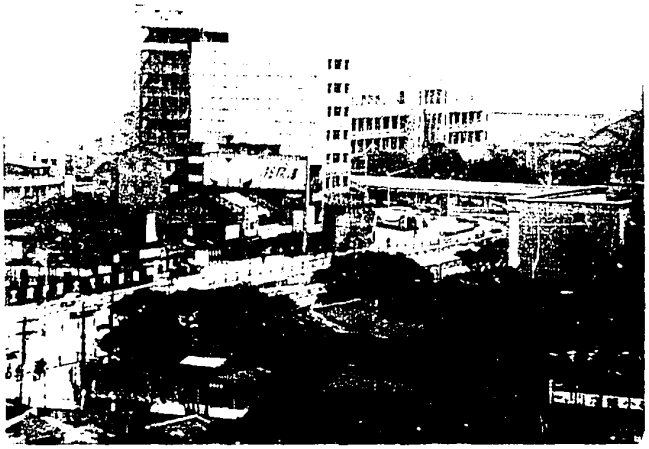






1 OLD CHINESE GATE
2 SKYLINE OF TAIPEI
3 TAIPEI MUSEUM
4 SKYLINE OF TAIPEI





1 OLD CHINESE GATE
2 SKYLINE OF TAIPEI
3 TAIPEI MUSEUM
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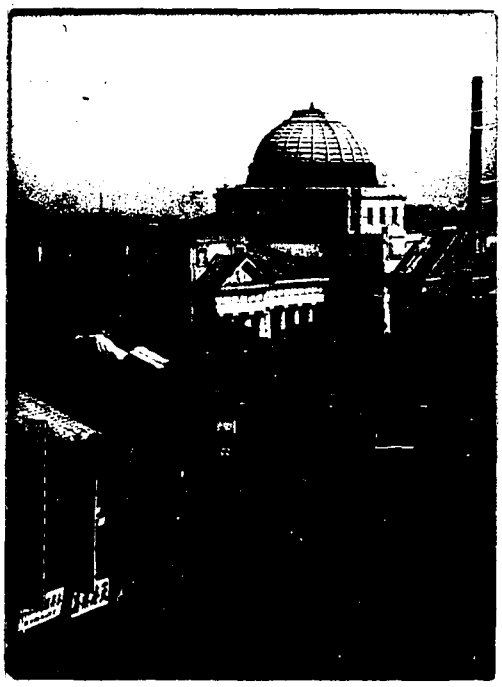

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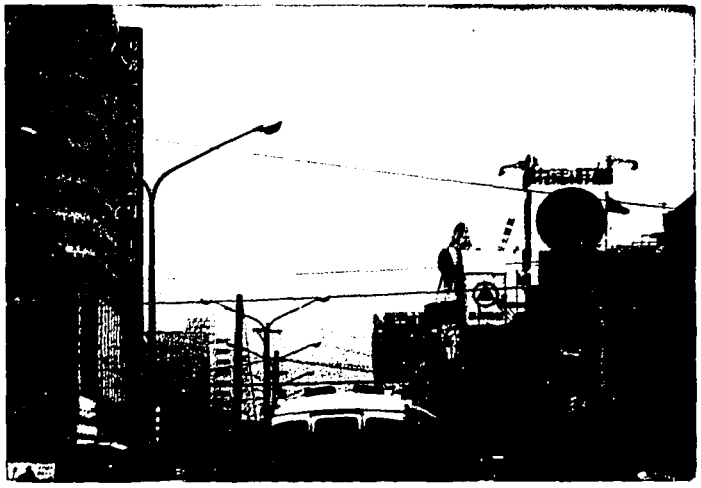

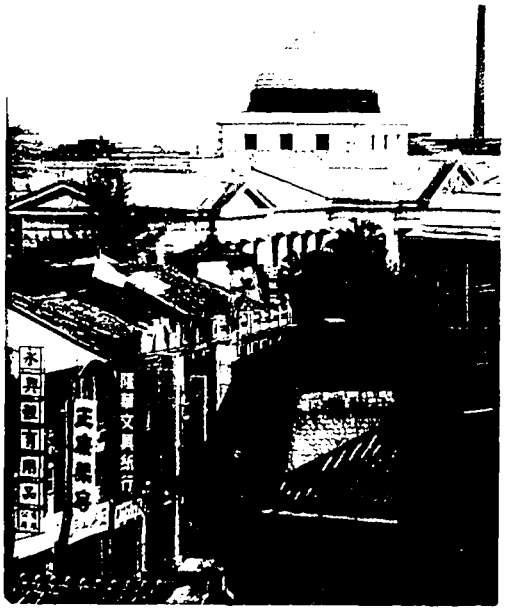

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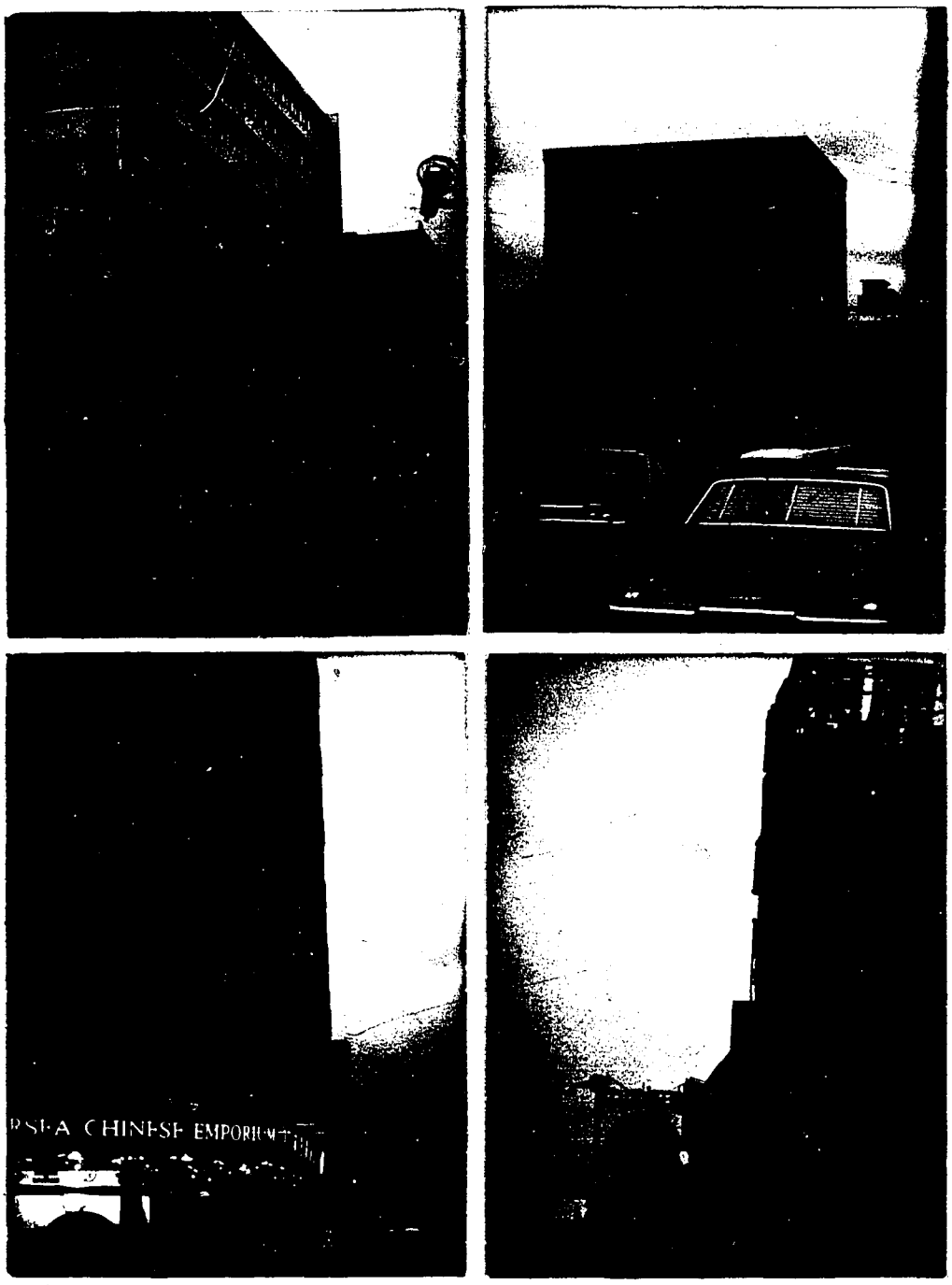
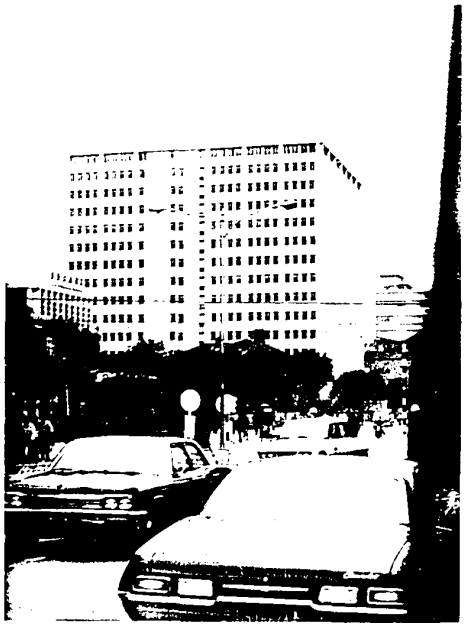


9 10
11 12



9 10
11 12

retail markets.

The central business district of Taipei was laid out during the period of the Japanese occupation. It was about one kilometer square defined by four main traffic roads where the old Chinese walls were located. The interior of the square is serviced by secondary lanes with sidewalks in addition to arcades forming the downtown pedestrian way.

The commercial district is a mixture of loose clusters of administrative and cultural buildings. The business streets are lined with a series of arcades, which shelter shoppers from the sun and rain and permit the display of goods. Most of the shops open upon the arcades. Western influence is evident in multi-storey department stores scattered within the central area.

Since a great number of the downtown employees use the bicycle, the downtown streets and arcades are usually blocked by, or parked with bicycles. The existence of different types of vehicles has raised a serious traffic problem in the central business district. There are trucks, automobiles, motorbikes, primitive low-powered cargo carriers, bicycles, pedicabs, and handpushed cars, all intermingling in the streets. The problem lies in the intersections: the change of traffic signals results in a mad scramble of the different types of vehicles with varying speeds.

To achieve improved traffic control, vertical separation

at the main intersections and parking lots have been applied in the central business district.

Factories range from food processing, through textiles, clothing, and other light industries to machinery. These factories are generally close to a railway or located along the Tanshui and Hsintien Rivers.

In examining the residential communities it appears that better conditions exist in the north-west and south-west parts of the city, than in the eastern area. Most of these communities were developed after the Second World War. The narrow lanes and disordered pattern of squatters' shacks are found generally scattered in the south-east and southern parts of Taipei.

From statistical data we find that the role of housing plays a small part in the national economy. The national distribution of private consumption indicates as follows:[1]

	%
Food, beverages and tobacco	56
Transportation and communication	12
Personal and health care	8
Furniture and household equipment	8
Rent, fuel, water, light	7
Clothing and personal effects	6
Recreation and entertainment	3

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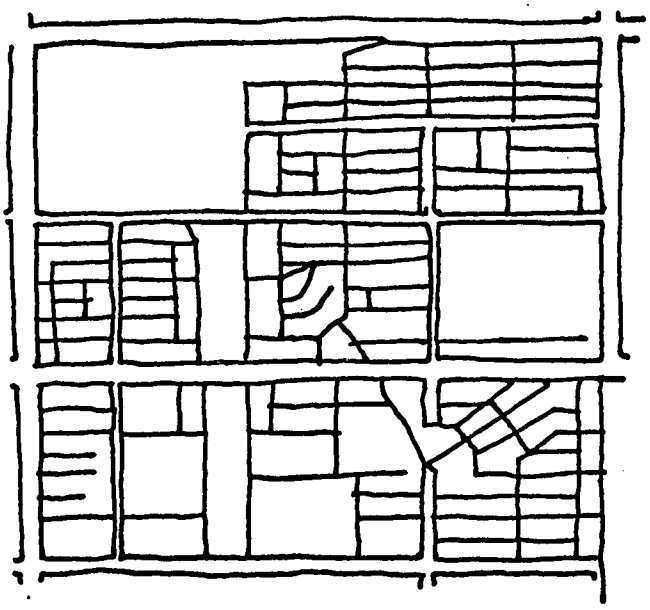
[1] Taiwan Statistical Data Book, 1964
Council for International Cooperation and Development.
Executive Yuan.



1 CHUNGSHAN

FIG 42

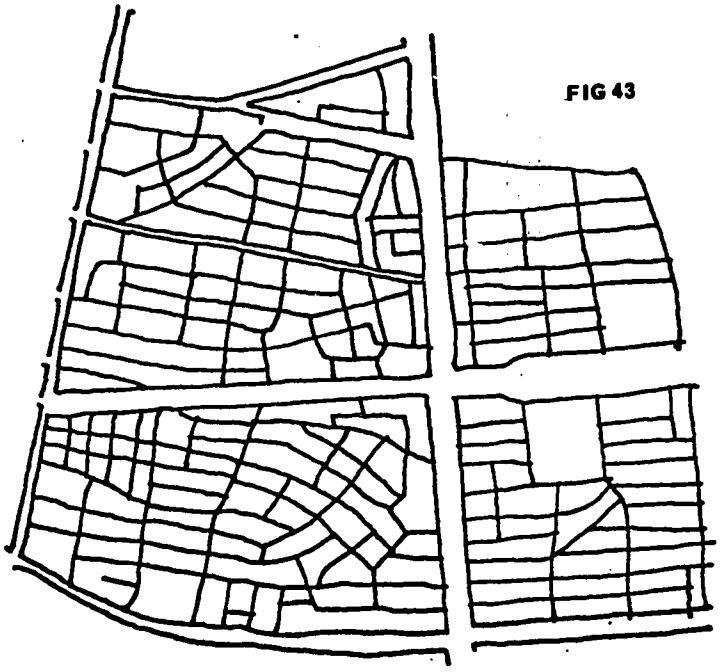
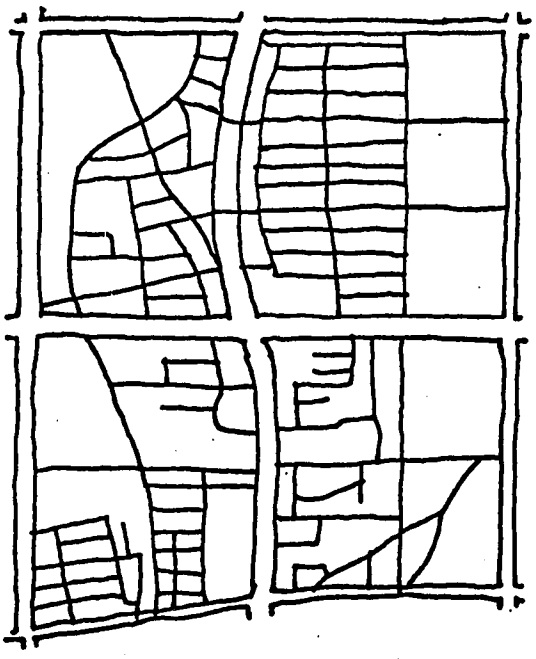


FIG 43

PATTERN OF RESIDENTIAL NEIGHBORHOODS

2 TA AN

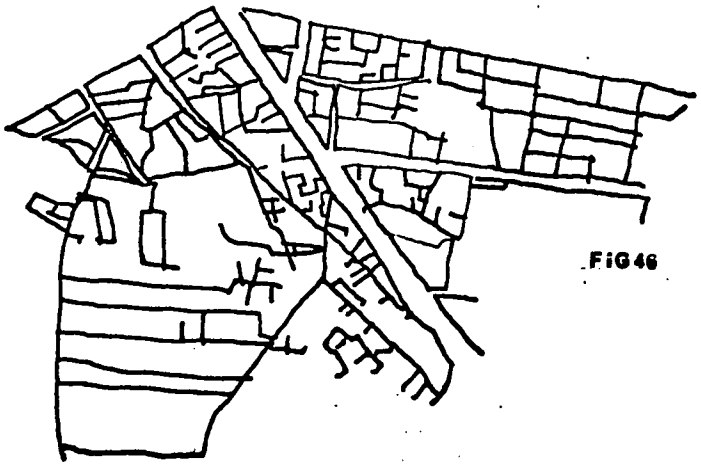


3 TATUNG

FIG44

4 LUNGSAN

FIG45



5 KUTING

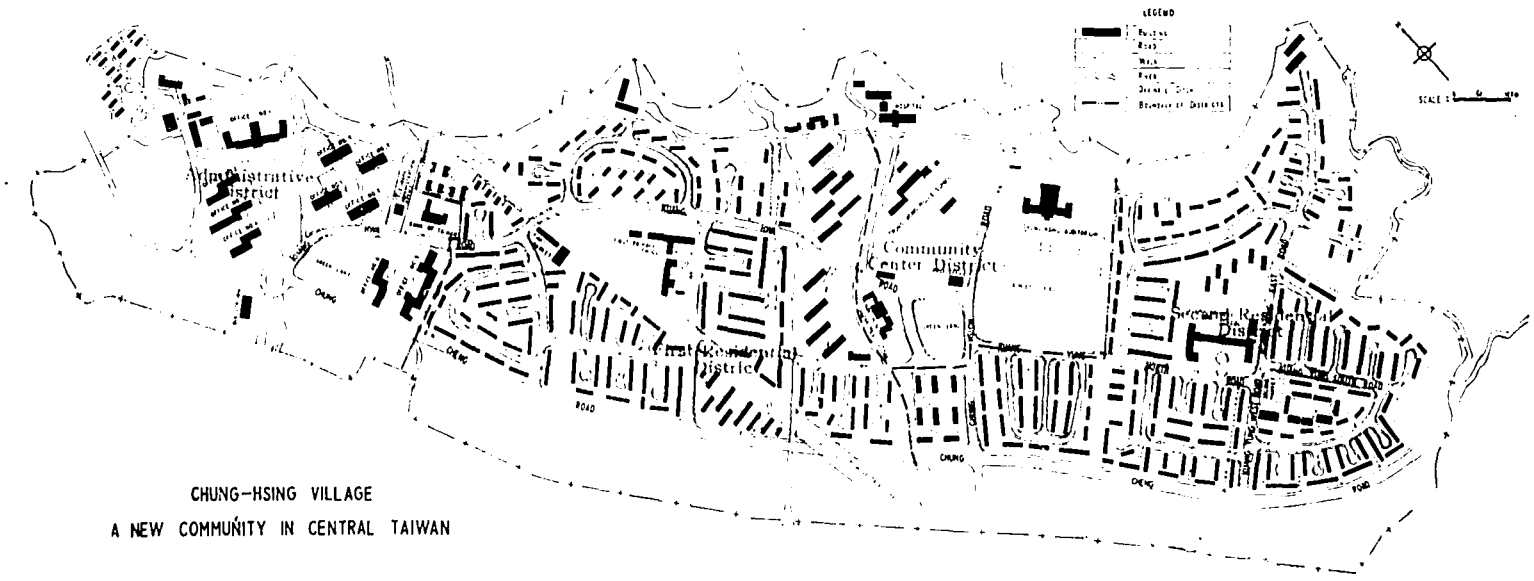
FIG46

Obviously, the lower income families would spend higher than 60% for food. In comparison with the more industrialized countries, the people of Taiwan spend too small a proportion of their income for housing. As Taiwan is in a stage of light industrial development, the consumption patterns are different from West European, U.S., or Canadian distributions.

Referring to the residential neighborhoods of Taipei city, the street patterns are laid out in orderly rectangular grid in the north and the west. The old districts of Lungsan and Yenping are formed by an irregular pattern with narrow lanes in the east, while the misshaped blocks and disordered alleys are affected by the shacks in the south. In Hsuan Yuan area, the residential neighborhoods are almost a cluster of squatters.

In general, the primary schools are uniformly distributed with respect to the neighborhoods. There are as many as four high schools in the western area, while in others there is none. Public facilities are limited to district offices, police stations, and health centers located without orderly layout. Most communities lack local parks or children's playgrounds.

FIG 47



CHUNG-HSING VILLAGE

A NEW COMMUNITY IN CENTRAL TAIWAN

CHUNG HSING

CONCEPT:

Chung Hsing village is the first and only community with neighborhood planning in Taiwan. The project was set up to relocate the Taiwan Provincial Government from Taipei to central Taiwan in 1955. There were three aims in the relocation project:

1. The new site for the Provincial Government should be within easy access to the transportation lines but not necessarily in close proximity to the main railway trunk lines running north and south.
2. The relocation project should in no way involve excessive use of paddy fields so as to affect the production of rice.
3. The relocation project should not disturb or interrupt the normal life of the local communities.

In order to achieve sound and comprehensive planning, the site was carefully chosen and its location near the Tiger Mountain makes it one of the scenic spots of the island; its connections by train and by bus make it easily accessible from all parts of the island.

The community is composed of one administrative district, one centre and five residential groups. Since it is the provincial capital, the character of the community is a homogenity of neighborhoods. It is also a dormitory town for the civil servants, with daily and social services.

SIZE AND DENSITY:

The site of Chung Hsing is approximately 1.75 miles wide and 3.5 miles long. The whole community includes Ying Pan-Kou, Nei Lu and a part of Shan Chiao Li, covering an estimated area of 1,105 acres. Of the total area, 635 acres were planned to accommodate 24,700 persons, while the remainder was proposed as an agricultural and forest preservation area.

In the first residential group, various types of houses were constructed for the accommodation of 2,700 persons, at the gross density of 40 persons per acre.

The second residential group covered an area of 76.5 acres, with similar density to the first group of 40 persons per acre.

The proposed third, fourth, and fifth residential groups would be three-storey apartment buildings with a density of 100 to 150 persons per acre. So far only the first and second residential groups have been completed.

ELEMENTS:

Dwelling Units

There are six dwelling types designed in Chung Hsing: (1) one-storey semi-detached (2) one-storey row houses (3) two-storey row houses (4) two-storey flats (5) two or three-storey bachelor apartment buildings (6) workers' quarters. Because of the uniform

occupation, the size of the houses is based on the family structure. All these houses are reinforced concrete beam and slab construction with brick or concrete block exterior walls. The house is generally set back at least 20 ft. from the street, and each house has its own garden plot.

Schools

There are two primary schools and one high school provided for the education of the children of government employees. In the first and second residential groups, each primary school is located in the centre, within a walking distance of 1,500 ft. The primary school buildings are all of one-storey reinforced concrete beam and slab construction, with brick walls and tile roof. Each school has an auditorium, a library, teachers' office, classrooms, and playground. In the campus, each has a fountain, a flag pole, covered playground and entrance gate.

The buildings of the high school are two-storey reinforced structures and are constructed by stages according to actual requirements.

Shops

The markets were built in the first and second residential groups. Like the primary school, it is located in the centre within

a walking distance of 2,000 ft. The way of Chinese living is different from the North American; the Chinese housewife has to buy daily food from the market and the role of the market is therefore similar in some respects to the shopping centre in Canada.

Centre

Open Space

In the community centre, there are a shopping centre, a high school, a post office, a hospital, and auditorium. The three-storey shopping centre contains a department store, a restaurant, a barber shop, billiard rooms and a hostel.

The centre lacks compactness and is separated by a vehicular road into three parts. Obviously the initial plan was to use the stadium, auditorium, and swimming pool for the high school students as well as for the public. Children's playgrounds and parks are all adjacent to the centre.

ARTICULATION:

Chung Hsing lies 24 miles north of Taichung which is the major city in central Taiwan. The system of circulation contains four types of roads as follows:

1. Main roads - 50 ft. in width, are designed to carry through traffic between the districts and surrounding areas.

2. Minor roads - 20 to 35 ft. in width, are designed to connect administrative district, centre and residential groups.
3. Service roads - 15 ft. in width, are designed to collect the traffic among 'superblocks' and residential groups. In most cases they are dead end streets.
4. Sidewalks are laid on both sides of the street. Pedestrian paths, 6 to 10 ft. wide, are arranged at the back of every house.

In examining the street pattern, the layout of loops and cul-de-sacs are obviously the result of American influence. The Radburn layout is very seldom found in the island, but this is the exceptional case. Nevertheless, the trend of private housing projects is to follow the grid pattern and ignore the importance of communal sense.

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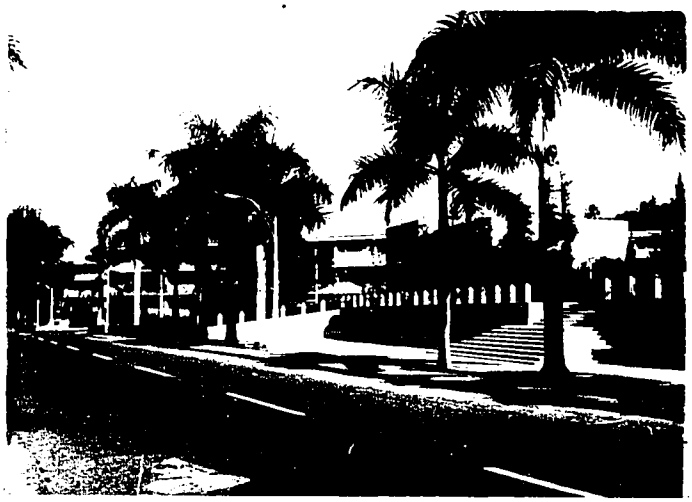
MAIN ENTRANCE
OFFICE BUILDING



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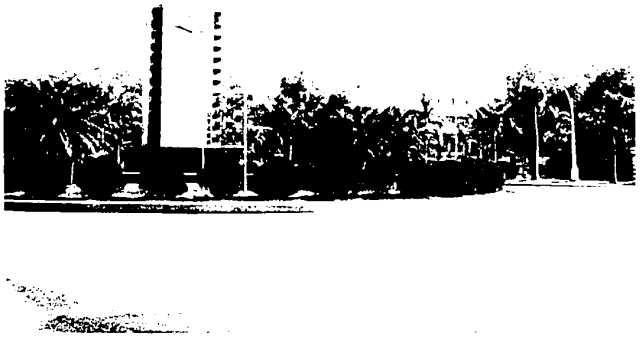


3

MAIN ENTRANCE
OFFICE BUILDING

4

5

- TWO-STORY ROW HOUSES
- SINGLE-FAMILY HOUSE

6

7

- ROW HOUSES
- BACHELOR APARTMENT

8

5

TWO-STORY ROW HOUSES
SINGLE-FAMILY HOUSE

6

7

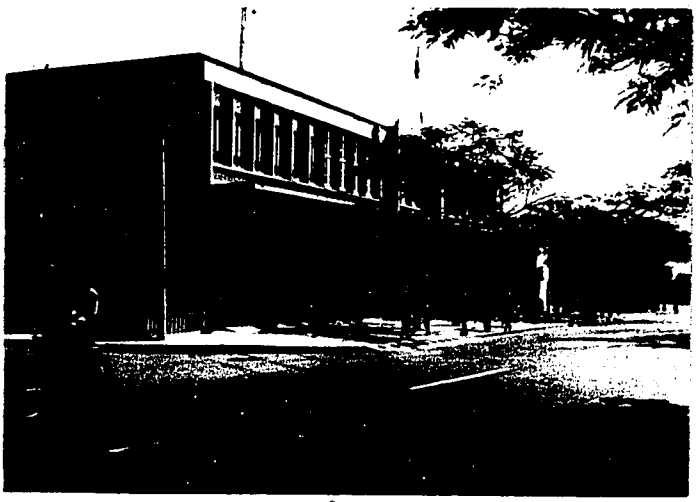
ROW HOUSES

8

BACHELOR APARTMENT

9

SHOPPING CENTRE
FIRE STATION



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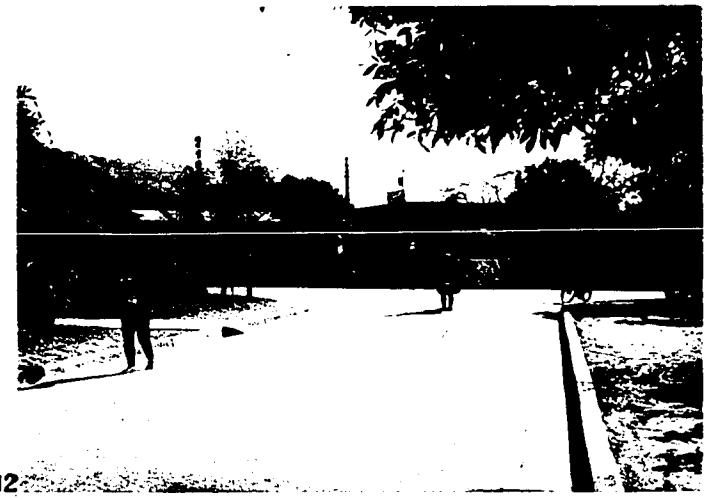
MARKET



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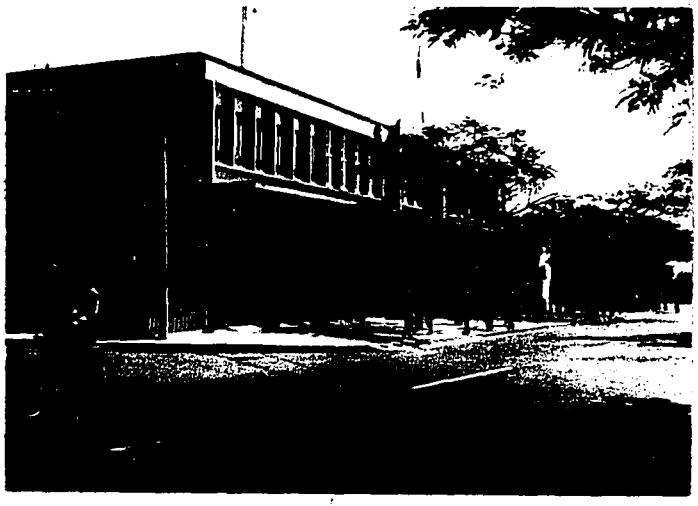
9

SHOPPING CENTRE
FIRE STATION



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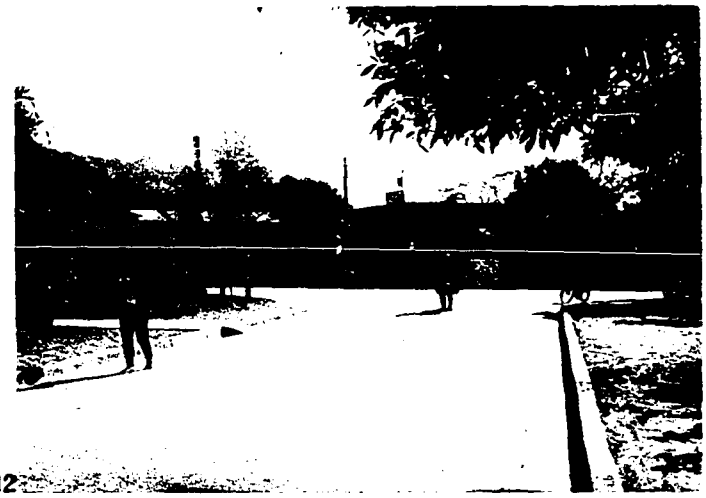
11

MARKET



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SHOPPING CENTRE
FIRE STATION

10

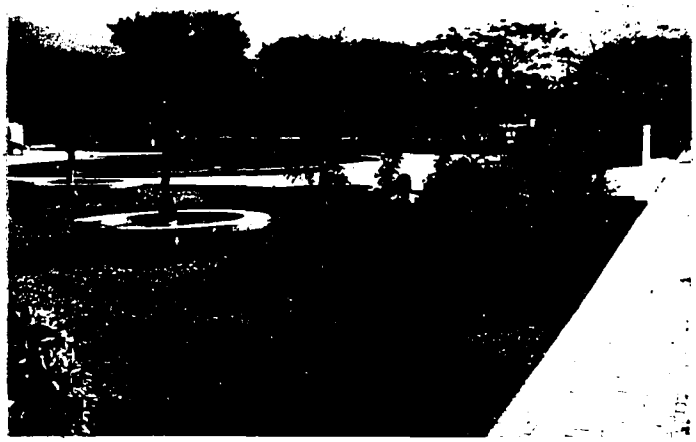
11

MARKET

12

13 HIGH SCHOOL

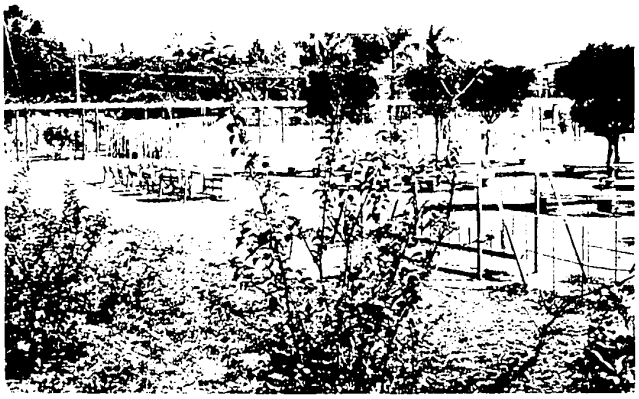
ELEMENTARY SCHOOL 14



15 PARK 16

13 HIGH SCHOOL

14 ELEMENTARY SCHOOL



15 PARK 16

17 MAIN ROAD

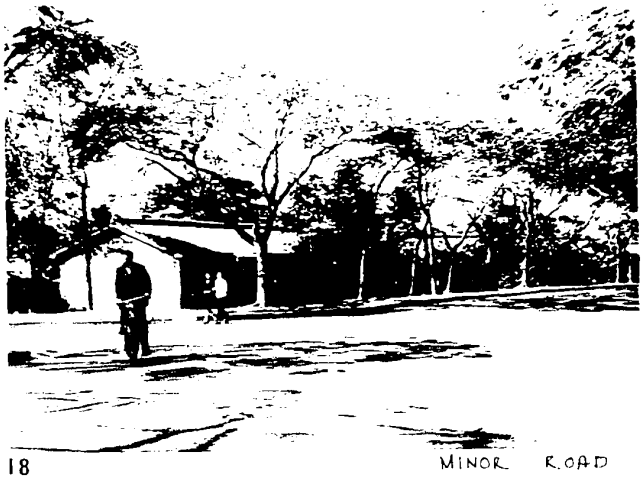
CUL DE SAC 19

18 MINOR ROAD

PEDESTRIAN 20

17 MAIN ROAD

CUL DE SAC 19



18 MINOR ROAD

PEDESTRIAN 20

THE GROWTH OF THE CITY

In 1966 there were five cities with a population of over 278,000 on Taiwan. Two of these form the core cities of the Taipei-Keelung Metropolitan Area that was delimited according to the definition of Standard Metropolitan Areas of the U.S.A. by Taiwan Public Works Bureau.

As far as size and population are concerned, the area covers two cities and 39 townships, with 2,500 sq.kilometers and 2,334,000 persons. It is rapidly growing and has the greatest concentration of refugee families in the island. The regional population density in the area grew from 577 persons per square kilometer in 1950 to 937 persons in 1960.

Since rapid urbanization has taken place in the cities of Taipei, Keelung, and their adjacent areas, the whole region has merged into a larger urban settlement in the northern part of Taiwan during the recent years.

In 1965 the growth rate of industry was 16 per cent, that of agriculture was 6 per cent. The future economy of Taiwan depends largely on industrial development and expansion of foreign markets. The population has grown so large, relative to arable land, that agriculture cannot provide the only basis for a high standard of living.

In many cases current residential development takes the form of piecemeal additions to existing settlements. On the basis of economic and sociological factors in Taiwan, an overall program for housing, urban uses, and communications must be undertaken.

SUMMARY

During the periods of Dutch, Portuguese and Spanish occupations, foreign influences were introduced into the island. As the Chinese moved from the mainland over the past centuries, they developed local traits and variations. Like a forbidden city in China, Taipei was defined by walls at that time. The Japanese occupied Taiwan from 1895 to the end of the Second World War. They removed the old walls to create roads. Taipei was rebuilt with some Japanese buildings. Streets were planned and commercial buildings constructed.

Today, the physical environment of Taipei has two faces: the pseudo-Chinese and the American styles. Both are mixed with some old Japanese buildings while the ancient core still remains. As economic conditions improve, the city of Taipei grows. But comparing Taipei with western cities, development is almost horizontal due to the height of the buildings being restricted on account of the frequency of earthquakes.

Chung Hsing, the new provincial capital, has been built on a completely new site. Design standards are fairly high, land-use control and peripheral control are strict. Construction was by conventional methods without the use of heavy equipment. The development of the town is to be carried out by three stages.

Housing units are overcrowded in many existing cities. Comparing the physical quality of houses and the standard of social facilities, Chung Hsing is superior to most towns in Taiwan.

In general, many parts of Taipei have clumsy groupings of houses, lack of open spaces, narrow streets, and inadequate markets. However, the planning of Chung Hsing new village provides for open spaces, well designed streets and adequate shopping areas.

The use of the neighborhood unit and superblocks with cul-de-sacs is obviously affected by American influences in Chung Hsing. The pedestrian path has been formed between the rear yards of houses. The local officials have not emphasised the separation of automobile and pedestrian because of the low proportion in car ownership, thereby eliminating the need for over- and underpasses.

The shortcoming of Chung Hsing is the failure to create a vital centre. The loose layout does not tend to integrate the core with the residential sectors. Furthermore, the population in Chung Hsing is composed completely of civil servants and their dependants; the whole community lacks variety in its population structure. Nevertheless, the living environment is much better than most unplanned developments which have no adequate social facilities and comprise squatters' settlements in sunless shacks in the existing cities of Taiwan.

SOME SUGGESTED THOUGHTS

CONCEPT:

In the present transitional period, the changing socio-economic structure of the island is emerging from an overwhelmingly agricultural economy to a modern industrial state; from a centuries-old pattern of village life to the complexities of urbanization; from the traditional Chinese concept of the family as a dominant unit to awareness of the common welfare.

The importance of neighborhood planning has to be given serious attention in Taiwan. The cities are overwhelmed by low income population growth because of the wide disparity in income between rural and urban areas. There are inadequate houses and other necessary facilities whereby a family can occupy a healthy home. A squatter feels frustrated at society; it is not merely a private problem of family, it is a problem for the whole community.

Observations to be borne in mind in neighborhood planning for the island should be:

1. The acquisition of huge tracts of vacant land for the development of concentrated towns or self-contained satellite towns is not applicable in the mountainous island of Taiwan.

2. Owing to the critical problem of numbers, one solution would be a planned chain of neighborhoods on a region-wide scale.
3. Formation of a system of neighborhoods as a new settlement pattern, to skim off the inter-city growth.
4. Development of residential neighborhoods in linear form and adjusted in shape to follow the topography.
5. A large number of standardized or prefabricated housing units may be laid out on the basis of family size and habits to deal with the living problem of the population.
6. To ensure that the people of the island understand the importance of communal responsibilities, instead of being lost in a large amorphous city, adequate social facilities to be provided.
7. The criteria of one car per family as a dominant factor for Taiwan neighborhoods is irrelevant. An effective rapid mass transit system should operate between the new industrial parks, urban units and inner cities.

The principles of residential neighborhoods are needed in Taiwan. Solutions will have to be found with reference to local conditions which will differ from North America or Europe.

SIZE AND DENSITY:

There is no legal definition of the term 'urban' in Taiwan. The term was defined as "any place with a population concentration of 2,500 persons or more and provided with the minimum services for urban life".

In accordance with western principles of neighborhood planning, the size is generally based on the radius of walking distance. Considering the small proportion of private car owners in Taiwan, it is much more important to make the walking distance justify the size.

To provide a local market and primary school for an adequate number of families, I would suggest that the size of the neighborhood vary with the topographical condition ranging from 1,000 to 1,200 families. Each unit would be planned roughly three quarters of a mile long and half a mile wide in linear form strung to an arterial road.

ELEMENTS:

Dwelling Units

Much of the existing housing is deficient with regard to space and access to light, air and sunshine. Space standards should be set on the basis of the Chinese way of life.

The dwelling is not merely a shelter from the weather, it is a basic need of human living: both quantity and quality have to be provided. Unfortunately, this is not generally recognized by the people, or even by many government officials in Taiwan.

The various types of dwelling units could be laid out in terms of cost and adaptation to Chinese customs thus: multi-level or walk-up apartments, bachelor dormitories, storied-row houses, row houses and public housing under the promotion of government policy. The dwelling layout would be a mixed development with a small proportion of detached houses.

The recent tendency of housing projects lacks variety in arrangement on the island. The grouping of dwelling units should avoid monotony. The natural geographical features should be utilized to the maximum.

Schools

Because of the sub-tropical climate, a long distance to school is undesirable for the young child. Children of primary schools or low-grade pupils should not have to walk more than a quarter mile from home to school. The school would best be located at the centre of pedestrian networks without crossing major traffic routes. For the high school students, bicycle paths may be parallel to the pedestrian walks.

Shops

Centre

In Taiwan, small shops and markets for daily needs are playing a more important role than other neighborhood facilities. Usually the Chinese housewife has to shop every day. Although the refrigerator is not a 'luxury item' in the middle class family, frozen food is generally disliked by Chinese people. Small shops may be scattered or form a sub-centre within residential groups.

The neighborhood centre would be composed of shops, market, clinic,communal hall and library. To achieve a sense of belonging together, the centre should be linked with pedestrian networks to embrace the neighborhood as a whole.

Open Space

The traditional Chinese courtyard as a common open space for a number of families is equivalent to plots for communal use within the group of dwelling units in North America. Apart from school playgrounds and public meeting-places or parks, open space would be formed between the chains of neighborhoods. For instance, following the Keeling River, a continuous green belt may be arranged along the Taipei-Keelung valley.

Playgrounds, parks and green areas are to be laid out in accordance with the planned population density and natural environment. Open space can be designed for various recreational activities to create a vital element in common life.

ARTICULATION:

In seeking a better environment for the outward population movement to the adjacent suburbs and the outlying region, the continued growth of the urban areas should be planned.

The urbanized pattern has been largely shaped by the railway and main roads in Taiwan. Both are roughly parallel and follow the topography. The first provincial express highway has been constructed between Taipei and Keelung. It will be continuous from the north to the south of the island.

Future development is likely to extend into a band corridor and the chains of residential neighborhoods would be superimposed on these transportation routes. For the convenience of a great number of people in Taiwan, the train, buses and rapid mass transit system have to operate as commuter and inter-urban traffic.

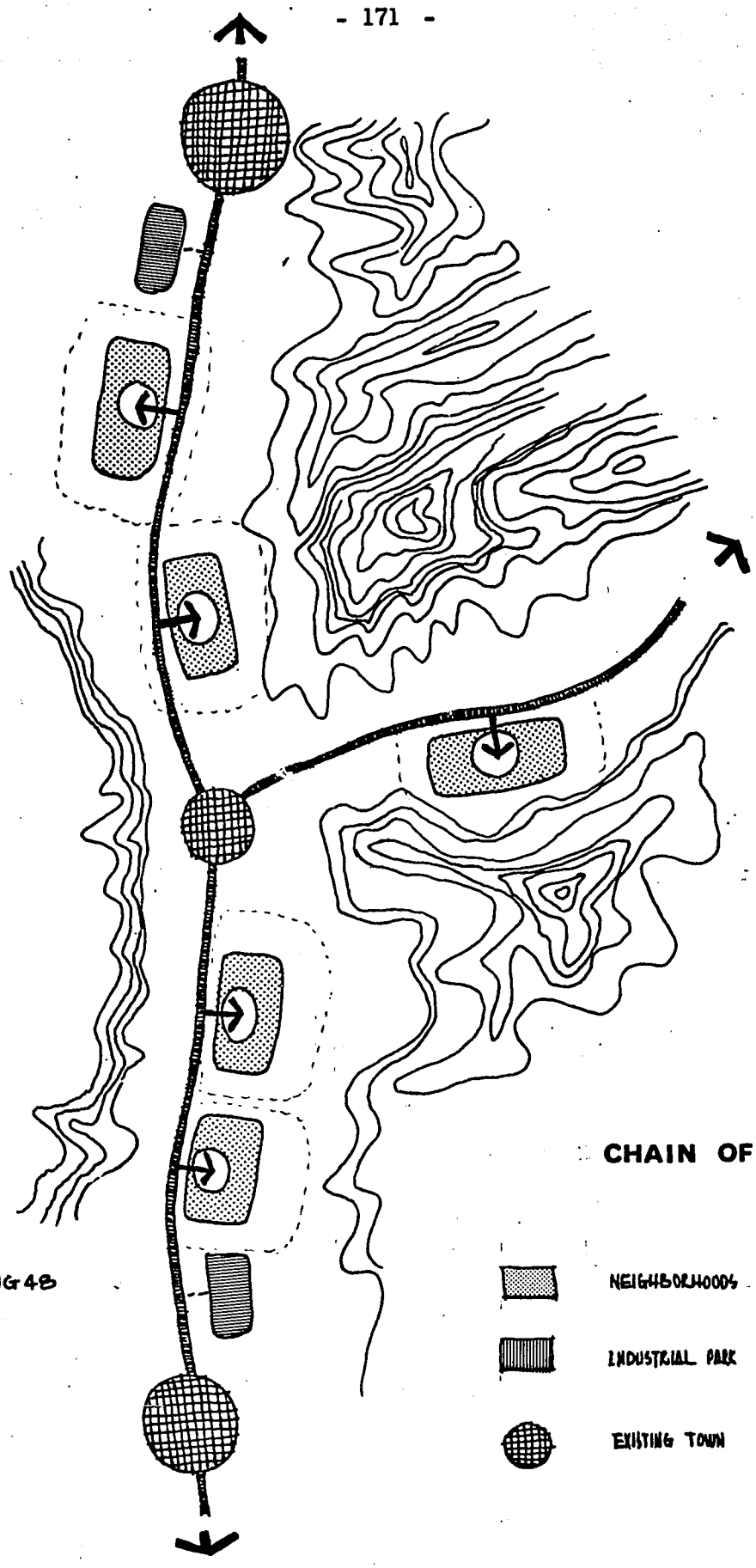

CHAIN OF NEIGHBORHOODS
NEIGHBORHOODS
INDUSTRIAL PARK
EXISTING TOWN

FIG 48

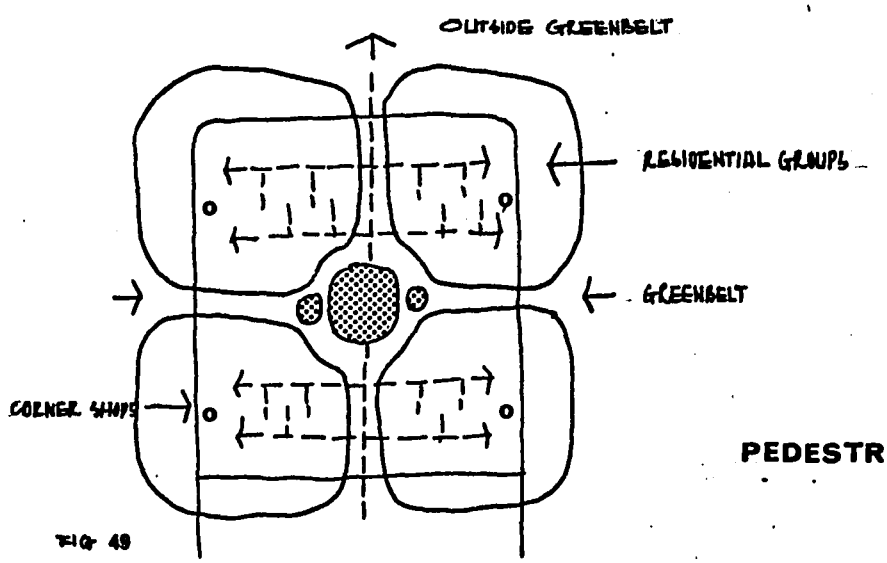


FIG 49

PEDESTRIAN

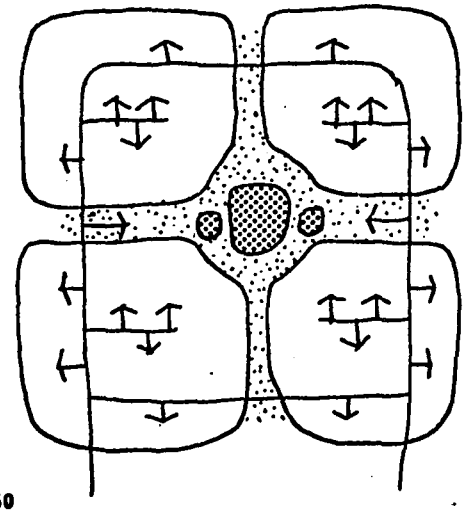
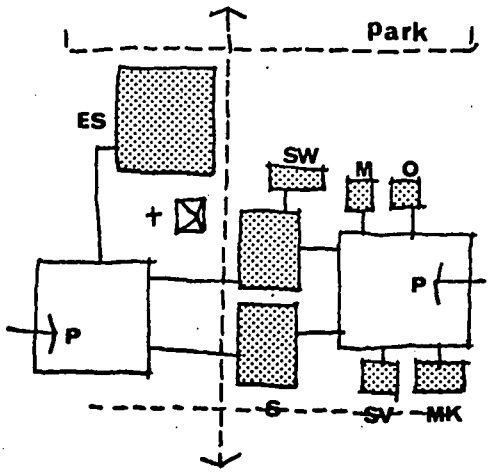


FIG 50

TRAFFIC

FIG 51



ES	ELEMENTARY SCHOOL
PL	PLAYFIELD
SW	SWIMMING POOL
CH	COMMUNITY HALL
O	COMMUNITY OFFICE
M	MEDICAL CENTRE
P	PARKING
S	STORES
MK	MARKET
SV	SERVICE

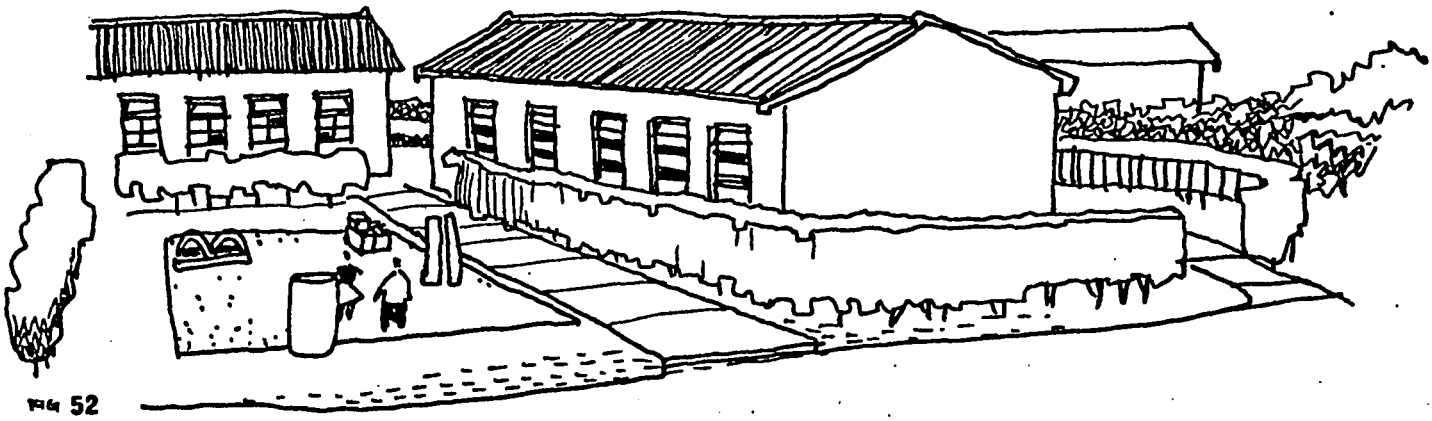


FIG 52

ROW HOUSES - PLAYGROUND

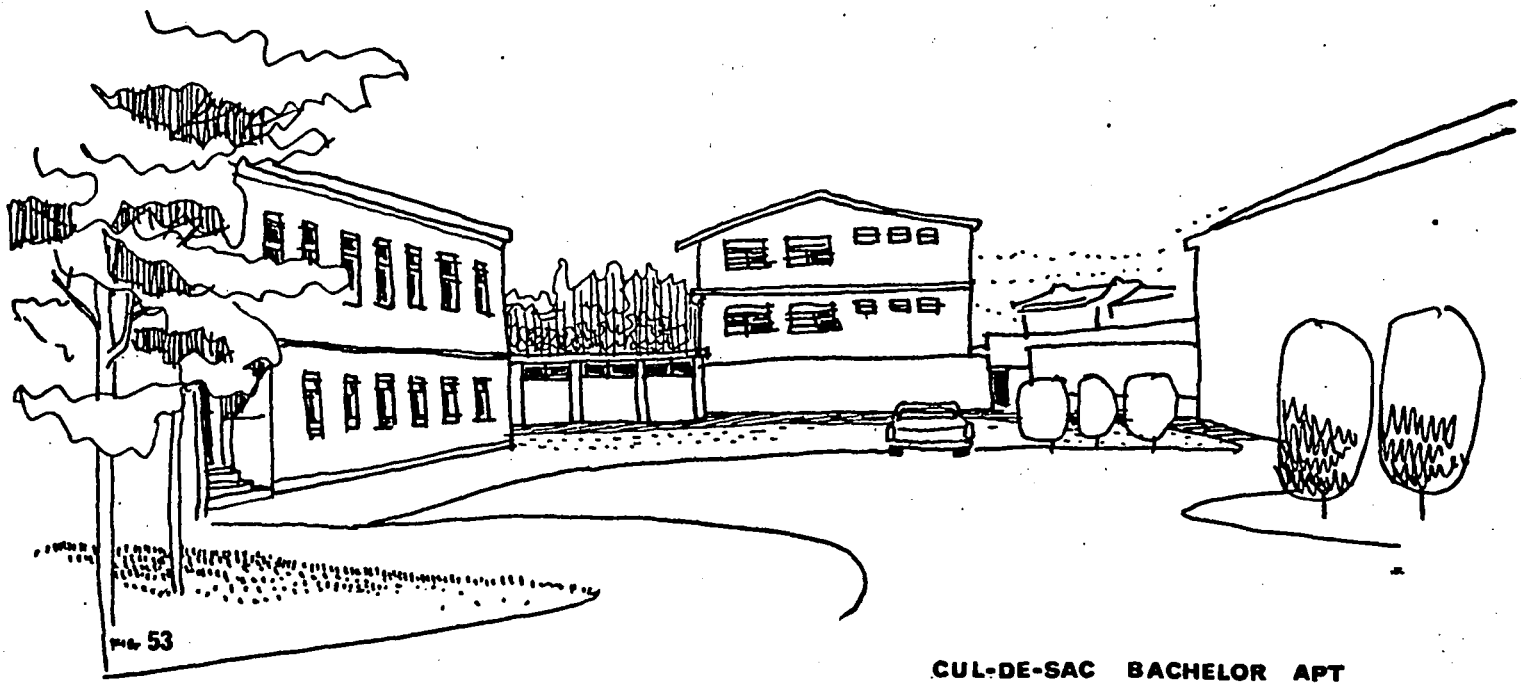
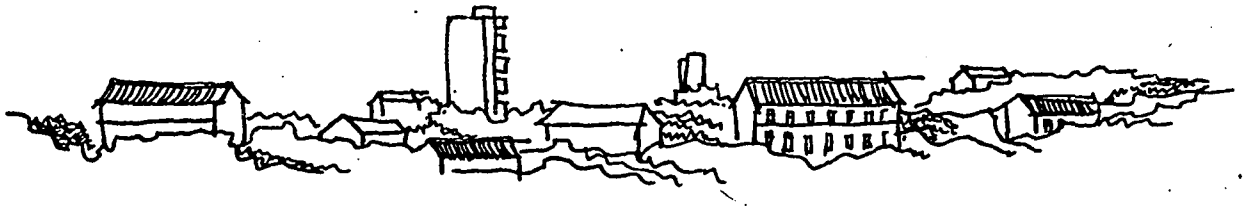
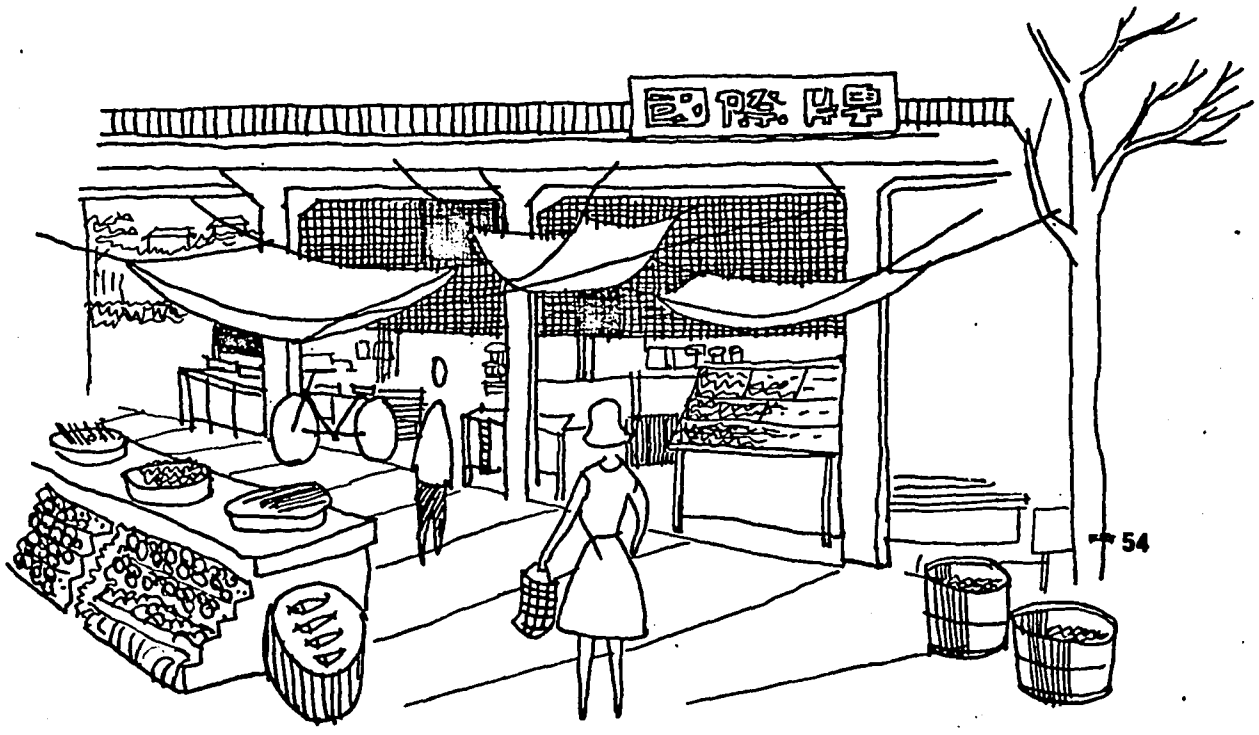


FIG 53

CUL-DE-SAC BACHELOR APT





MARKET

PART IV

GENERAL CONCLUSION

From the space arrangement within a fixed boundary in Garden Cities to the linear development of Hook, there is no universal criterion. In adopting the principles of residential neighborhoods in overall planning, the effectiveness in creating 'neighborhood' consciousness seems to vary. For instance, the ideal of 'urbanity' has increased density in Hook. Contrariwise, planning for the wilderness has kept the density fairly low in Kitimat. Similarly, various functions of Chandigarh are segregated and isolated.

The growing importance of the centre has emerged and the tendency to a main centre looks backward to a traditional spirit of common life. The multi-level deck as related to pedestrian movement has become a solution for the separation of man and car.

In most of the highly developed nations, the basis of an average of one car per family is a norm of neighborhood planning. Nevertheless, the wide variations in conditions, costs and customs of developing countries require particular consideration.

Certain common factors have been revealed in the process of our observations:

1. The concept of residential neighborhoods is generally based on walking distances.
2. Means of under- or overpasses for pedestrian inter-connection are adopted to ensure a better habitational environment.

3. The socially balanced neighborhood unit has been tested to some extent for the emerging needs of heterogeneity within homogenous groups.
4. The communal facilities have been grouped to create a sense of belonging and are vital elements of community life.
5. The growth of the residential neighborhoods is by stages with respect to the social and visual pattern. From the beginning, the centre and footpath systems grow spontaneously.
6. The form of residential neighborhoods has been planned as a pattern of inter-city growth.

The problems facing Taiwan are the great number of people, the limitations of housing, the lack of financial sources, and unplanned urban growth. Despite its housing shortage, community facilities are generally inadequate. For instance, the city of Taipei sprawls unevenly in a pattern of scattered and string developments, the private developer using up vacant lands for financial profit. With little control of urban planning, schools, playgrounds and other needed social facilities are scarcely considered.

Chung Hsing was planned and developed by the Taiwan Provincial Government; the whole procedure was an activity of government for its own use. Nevertheless, it has been revealed that in Taiwan complete neighborhoods can be carried out through planning.

To apply these factors, appropriate public facilities should be integrated with residential units. Neighborliness is a remarkable quality and many experiments have demonstrated this in their schemes. As human contact is demanded by the oriental way of life, a social intermixture of the population would be increased to create a whole diversified town. Due to the lack of recreation and a preponderance of low-income people, it is important to preserve natural beauty for the people in Taiwan. Open spaces would be laid out in accordance with the natural environment and be introduced into the groupings of housing.

The various conditions of economic, social factors and the living habits of people must be taken into account in the planning process. Industrial districts may be separated from residential areas by major roads or agricultural greenbelts, the location would be based on a regional scale.

In the developing Asian countries, sunless and congested shacks spread throughout the cities. A sound program of construction and development in terms of place, time and money must be made systematically at all stages.

Efficient planning for residential neighborhoods is required as well as adequate organization for the control of land and programming the growth of the town. The objective of residential neighborhoods is fundamentally a social rather than a profitable undertaking. The entirely private corporation with large-scale capital for long-term investment in development, such as Reston, is not applicable in Taiwan.

So far there is no organization to plan a systematic development program and no definite financing sources for community development in Taiwan. Owing to rapid urbanization and economic development in the past years, a co-ordinated operation between the government and private groups for building neighborhoods has to be established.

For the compulsory purchase of development land or through replotting, the joint corporation has to be empowered to carry out the provisions for the residential neighborhoods; financial assistance may be partially required through foreign investment.

Future residential neighborhoods have to find the satisfaction of humanistic values. The dehumanized settlement of machine-made sterility would not be satisfactory as a new order of urban development. From the exchange of ideas, new thinking would be filled with the significant contribution of experiments to form a new pattern of urban settlement.

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