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A B S T R A C T

Considering the complexities of Urban Geography, this study attempts to synthesise the many disparate elements within the whole field of Geography, in the analysis of one urban area, Tehran. The study stresses the contrast between Tehran and the rest of Iran, a result of the concentration of development within the capital city, and also the contrasting patterns within the city itself, the result of rapid expansion. The first three chapters are an attempt to consider the various processes that have contributed to the development of Tehran, which was arbitrarily chosen as capital less than two hundred years ago. Even within this framework contrasts due to historical or demographic differences become apparent.

The first chapter looks at the physical setting and how this has influenced the growth and development of the urban area. The second chapter considers the development of the city up to the Second World War, and the importance of historical processes for spatial contrasts within the city. Demographic characteristics are analysed in the third chapter.

The focus of the study is chapter four, in that it analyses the most important functions and activities of the capital and considers how these have developed, interacted, and been located by the physical environment.

Transport is analysed in chapter five, both internal and external. Finally chapter six is a synthesis of all the various processes and location patterns in the context of the major land use categories.

Throughout the analysis attempts are made to focus attention on the distinctiveness of the capital city, but at the same time to show how Tehran has been integrated into a regional, national, and international framework.

T E H R A N : A N U R B A N A N A L Y S I S

Thesis submitted to the
Faculty of Social Sciences, University
of Durham, for the degree of M.A.

H. Bahrambeygui

University of Durham,
Durham City,
England,
June 1972.

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Thesis
M.A. 154

PREFACE

The present thesis is the result of a period of study in the Department of Geography, at the University of Durham, England where the author had training as a research student.

The main aim of the study is to investigate the principle characteristics of the growth and development of Tehran, one of the largest cities in the Middle East. The main emphasis has been on describing and analysing the contemporary problems which have arisen as a result of the rapid expansion of Tehran, a city which until very recently had no comprehensive urban planning programme. The familiarity of the author with the field, in that he is a resident of Tehran, has to some extent facilitated the study. Nevertheless the sprawling vastness of the city and its huge population is enough to indicate that a detailed and comprehensive study of Tehran would require the cooperation of many research workers with different fields of specialization and rapid expansion means that no study can be totally up to date. The author's particular appreciation for guiding him through the complexities of such a study must go to Mr. B.D. Clark his supervisor together with thanks for his constant patience and encouragement without which this study would not have been completed.

I am also indebted to Professor W.B. Fisher, Head of the Department of Geography at Durham for kindly accepting me as a research student in his department and allowing me to have access to the Departmental library and cartographic facilities. I must also thank Professor J.I. Clarke for his kind advice and guidance.

In Tehran thanks are due to Professor M.H. Ganji, Head of the Geography Department and Professor K. Vadiel, Geography Department both of Tehran University for their initial recommendation and continuous encouragement of my work and also Dr. S. Rasekh, Head of the Statistical Centre of Iran, for providing me with the Enumeration District maps of the 1956 and 1966 censuses and other information.

During the course of my research programme, I received cooperation and valuable suggestions and comments from my research colleagues but I would particularly like to thank; Mr. D.J. Marsden (Anthropology Department) and Mr. K.J. Thorpe. I would like to thank all the staff of the Geography Department, the Science Library and the School of Oriental Studies especially the Middle East Documentation Centre and its Director Professor H. Bowen-Jones of the University of Durham.

Finally I offer my warmest thanks to my wife for her great patience, cooperation and endurance which has never failed.

Durham, June 1972.

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ABBREVIATIONS

- 1- D.C.R.S. Department of Civil Registration and
Statistics.
- 2- I.N.A.C. Iran National Airlines Corporation.
- 3- I.N.T.O. Iran National Tourist Organization.
- 4- N.C.C. National Cartographic Centre.
- 5- N.I.O.C. National Iranian Oil Company.

LIST OF COMMON LOCAL TERMS

1-	Bazaar	Market Place.
2-	Bazaarcheh	Local Market.
3-	Carvanserai	Large enclosed courtyard, surrounded by rooms for warehouse activities.
4-	Darwazeh	Gate (of city).
5-	Hammam	Public Bath.
6-	Juy (Jube)	Small uncovered canal for water drainage.
7-	Khiaban	Avenue, Street.
8-	Kucheh	Lane, Alley.
9-	Kuh	Mountain.
10-	Kuy	District, Street.
11-	Madrseh	School, Theological College.
12-	Mahalleh	District, Quarter.
13-	Maidan	Square, Place.
14-	Mawat	A legal term for unused lands.
15-	Qahvehkhaneh	Tea Shop.
16-	Qanat	Underground water canal.
17-	Sara	Commercial premises, for both wholesaling and retailing.
18-	Shahr	Town, City.
19-	Timcheh	A small market place having a few units.
20-	Vaqf	A ⁿ endowment land and/or property.
21-	Zoorkhaneh	Place for traditional sports.
	'abad'	Suffix meaning developed settlement.
	-e-	A sign equivalent to 'of'. e.g. Baq-e-Shah: the garden of the Shah.

Rial: The Persian unit of currency. In 1972 there were approximately 186 rials to the pound.

I N T R O D U C T I O N

The present city of Tehran as the capital of Iran is one of the largest and most important cities in the Middle East and accounts for 12% of the country's total population. This important position has been reached in a comparatively short period of time and has transformed a traditional city into a sprawling metropolis with little to show in many areas that it is part of an eastern nation. In function, and increasingly in form, it is virtually indistinguishable from many large western cities. The rapid growth of the city in comparison with the developing hinterland of the rest of the country has produced severe, and many would say dangerous, economic and social inequalities as a result of these contrasts. Tehran can boast 4 Television stations, has world cultural contacts and is perhaps more in touch with European fashions than many European cities. It is a centre for important international conferences (such as the O.P.E.C. conference in 1971 resulting in the so-called 'Tehran agreement'), and can play the spectacular host to world heads of state as witnessed at the recent celebrations for the 2,500 years of the Persian monarchy. And yet, although at the hub of world events, Tehran is not really representative of Iran when for example, subsistence agriculture, is still the most common livelihood of the majority of Iranians.

Political stability within Iran has greatly influenced the flow of foreign capital into the country, and this has

helped the rapid change. It has also been a period when royalties and revenue from the oil industry have been greatly increased. As the seat of government Tehran has received the lion's share of all development and with its wide tree-lined avenues, large buildings, luxury theatres, high-class residential areas, and newly built hotels and parks, it now appears very prosperous although increases in the cost of living and the price of land, services and facilities are all having important spatial effects.

Not only are these contrasts between Tehran and the rest of the country apparent but also contrasts that exist within the city. The attitude of the rest of the country to Tehran is ambivalent and not entirely un-resentful. All major decisions are taken in Tehran and most educated personnel wish to operate from Tehran. Within the city there are significant differences between the north and south, a major theme which will be developed in the following pages. One typical example of this is that northern residents usually enjoy the luxury of piped water whereas their southern counter-parts normally live in mud-houses relying on communal taps. Immigration into Tehran has been mainly concentrated in the southern suburbs producing overcrowded conditions and potential health hazards.

The emergence of the Pahlavi dynasty in 1925 was the starting point of much of the rapid socio-cultural, administrative and economic development. Rapid change was the direct result of the arrival of a large number of foreigners who introduced new values forming a kind of

'Perso-European' culture. Foreign investment for example was one means through which Iranians became familiar with western civilization. This in turn introduced considerable changes in Iranian traditions.

In 1948 the First Seven Year Development Plan was carried out by both the public and private sectors and introduced many new features of development. At the present time, the Fourth Development Plan (1968-72) is still in progress and has achieved the remarkable annual rate of 6.5 per cent increase in G.N.P. (a 10 per cent increase was calculated for 1970-71); a rate which is much higher than any other Middle Eastern country, and comparable to that of Japan. Per capita income is rising rapidly, but figures for the whole of the country give little indication of the absolute rise in Tehran itself.

During this period, a very large share of investment has been concentrated in Tehran, so much so that it forms one third of all national investment, which in turn results in a high degree of centralization. This is a major reason why Tehran enjoys a far greater rate of economic growth compared with the rest of the country. The promotion of economic development and its resultant effects on urban growth has been studied by many authors. In the case of Tehran it has resulted in rapid population growth since the Second World War. Between 1956 and 1966 whilst Iran had an overall growth rate of 32 per cent Tehran has had a 79 per cent growth rate. During this intercensal period an even greater rate of increase was in the two townships of Rey and Shemiran

resulting in a great expansion of the metropolitan area of Tehran.

The aim of the study is to analyse the modern city of Tehran to bring out how changes in the morphology and present day functions of the city are a result of the city being the political, administrative and economic centre of the country and how these factors have all had a great influence on the townscape of the city.

Thus whilst the study will stress the contrasting pattern between Tehran and the rest of the country, the main aim is to analyse the spatial contrasts within the city. The first three chapters are an attempt to consider the various processes that have contributed to the development of Tehran although even here contrasts due to historical evolution or demographic differences become apparent. The first chapter considers how aspects of the physical environment have influenced the city landscape. The second chapter considers the evolution and historical development of the city up to the impact of the Second World War. Whilst demographic characteristics are analysed in the third chapter. The focus of the study however is chapter four, which analyses the most important functions and activity system^s of the capital and considers how these have developed, interacted and been influenced in their location patterns by major geographic processes. Transport is then analysed in chapter five with emphasis being placed on both external and city networks.

Finally chapter six is a synthesis of the various processes and patterns of location in the context of land use.

For the convenience of the reader a map that gives the names of frequently mentioned areas and avenues of Tehran and a generalized land use map of the city, and five aerial mosaics covering whole Tehran are available in the back of the thesis together with a map showing the position of Tehran in relation to modern communications.

CHAPTER 1

PHYSICAL SETTING OF THE CITY

The interior part of Iran is a vast plateau, which encloses a series of basins which lie at an altitude of between 300-1,200 m. It is here that two of the world's most arid deserts are to be found; the Kavir-e-Namak and the Dasht-e-Lut. Aridity within this central area is one of the major reasons why most settlement is located on the margins of these deserts, towards the foothills of the surrounding mountains. (See Fig. 1.1) Here water resources are available, mainly from 'qanats'.¹ As a result, the large and important cities of the interior part of the country are located on the western, northern and southern flanks of these deserts. Furthermore important historical routes such as the great Silk Road from China to the Mediterranean passed through Iran on the southern slopes of the Alburz and the ancient Indian highway ran from south to north on the eastern flanks of the Zagros and connected these populated centres and were major reasons for their development. (See Fig. 1.1A)

Tehran, the capital city of Iran is one such city located on an alluvial plain, between two of the south facing valleys of the Central Alburz Range, the Karaj valley to the west and Jajrud valley to the east, with a mean altitude of 1200 m. (See Fig. 1.2). The city is only 18 km. from the 3800 m. peak of Tochal to the north and its south east suburbs

FIG. I.1 GENERAL LOCATION OF TEHRAN IN IRAN.

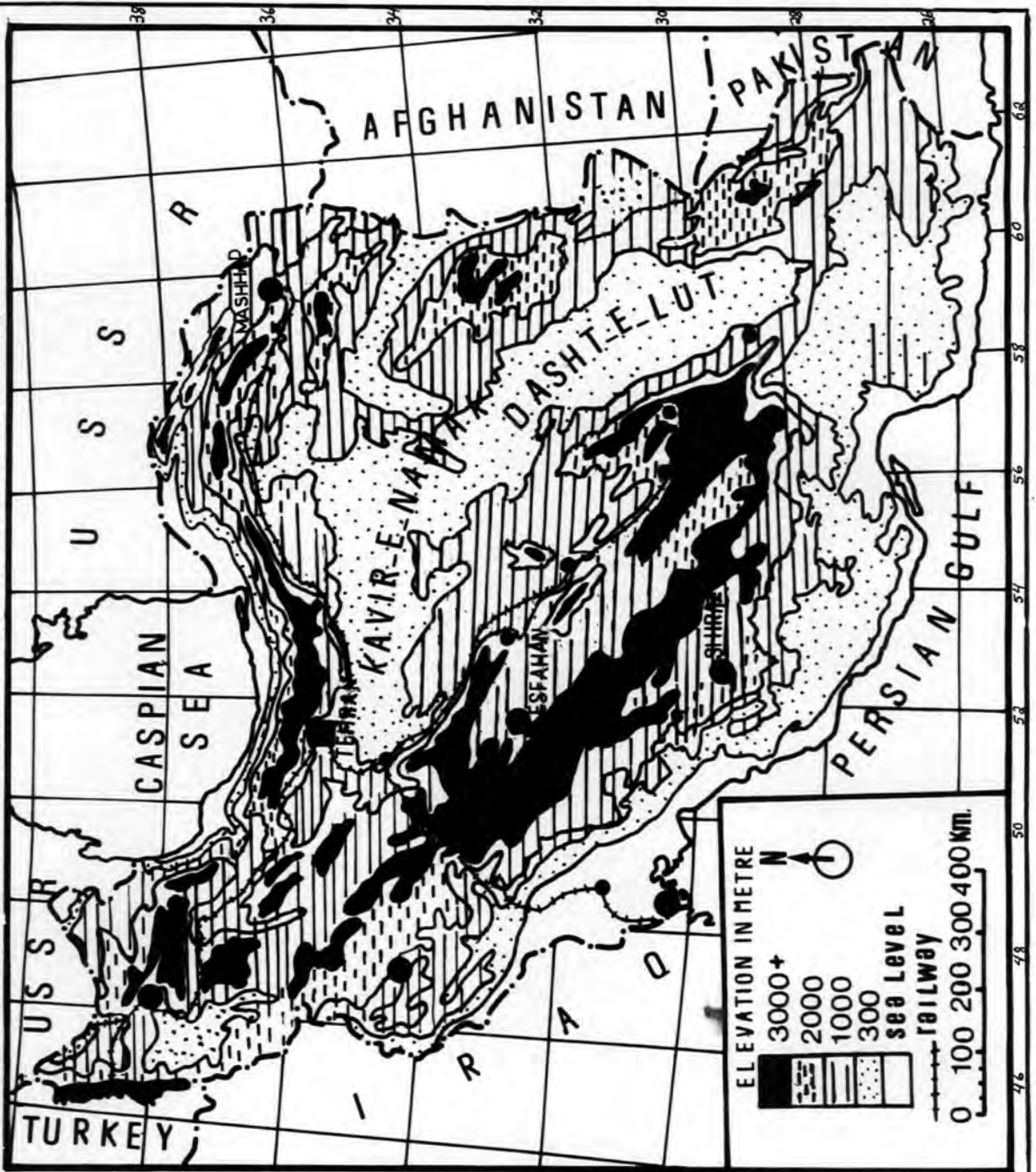
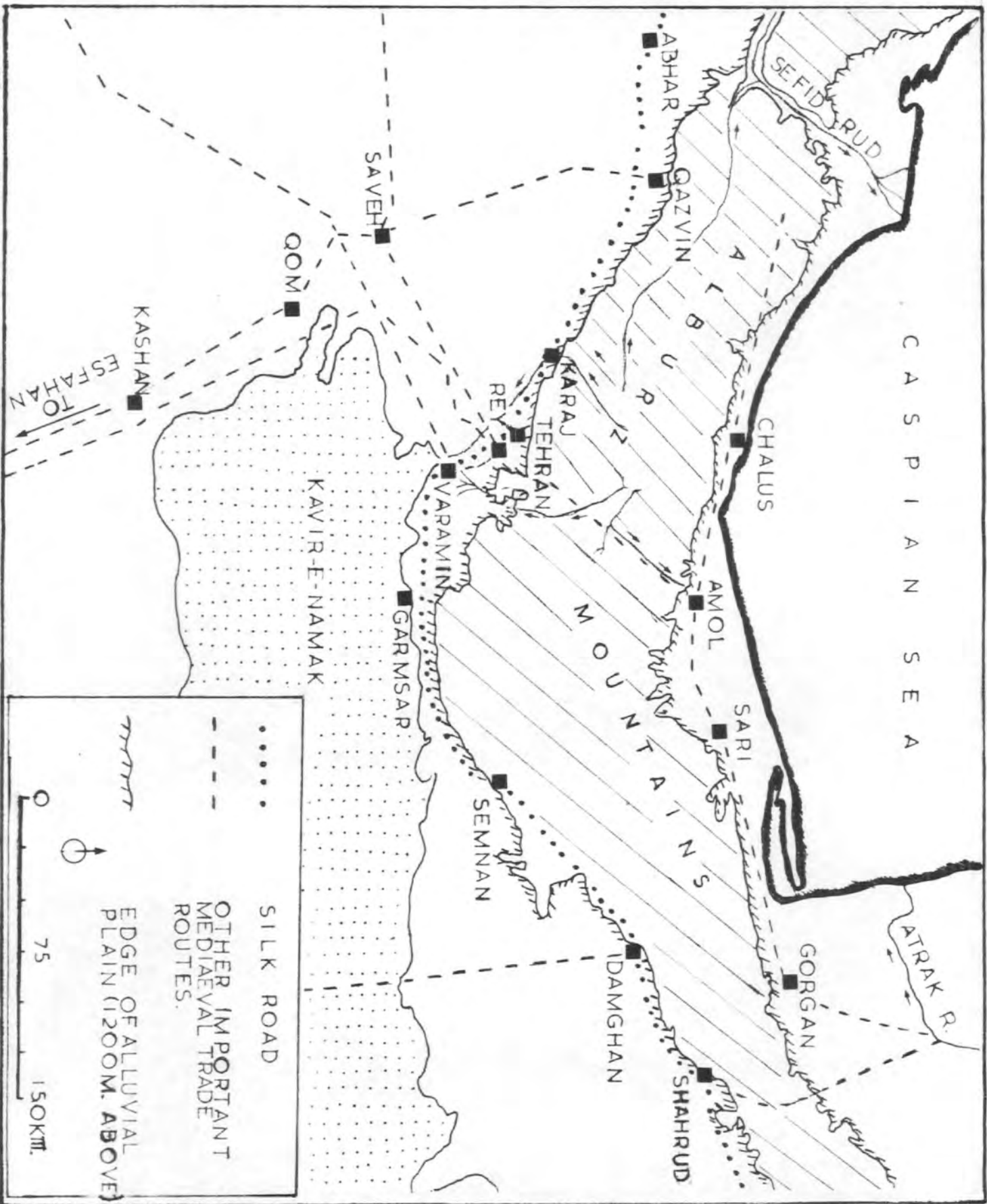


FIG.1A POSITION OF TEHRAN IN RELATION TO TRADE ROUTES ALONG THE ALBURZ PIEDMONT.



SOURCES 1. BOULNOIS, L. THE SILK ROAD, 1966.
 2. LE STRANGE, G. THE LANDS OF THE EASTERN CALIPHATE, 1930.
 3. BRICE, W. C. SOUTH-WEST ASIA, 1966.

N.B. PLACE NAMES NOT NECESSARILY CONTEMPORANEOUS.

are bordered by the sand of the southern desert.

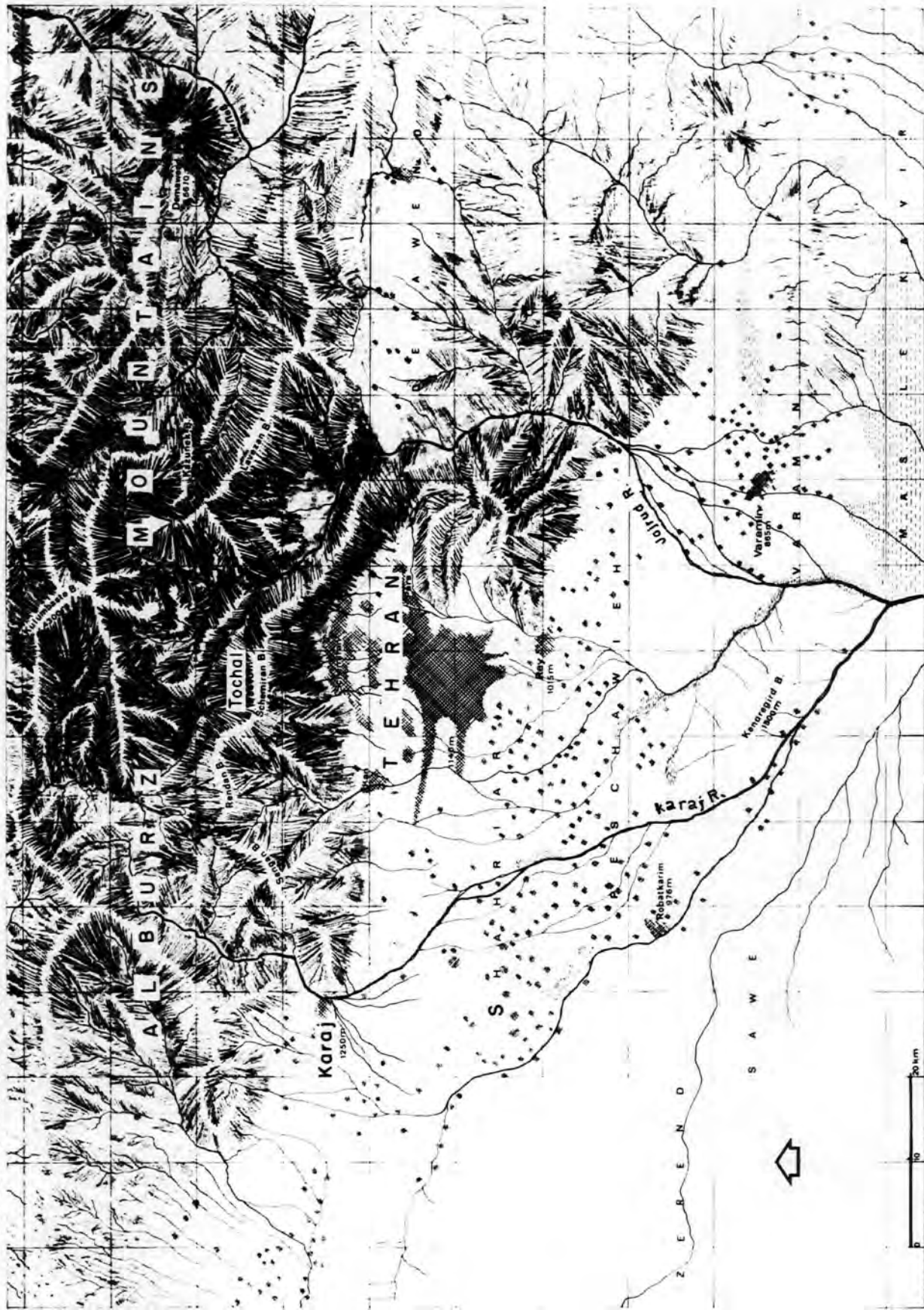
The plain of Tehran is covered by alluvium deposited by the rivers and seasonal streams running from the Alburz. Previous studies, have distinguished three physiographic zones in Tehran with a broad north-south trend.²

The first zone, now forming the extreme northern suburbs of Tehran, consists of heavily textured soil and is not very suitable for cultivation. Farmland is very limited by the shallow depth of soil, although some wheat and barley is grown. Overall however this is a limited zone except where gardens have been laid out on the flanks of south-facing valleys watered by streams such as at Darakeh, Evin, Darband and Shahabad. Summer retreats for Tehranis, occasionally in the form of houses, more usually as picnic and garden areas, are found in this zone.

The second zone is covered by shallow gravel on which most of the built up area of Tehran is to be found. The surface material originates from fragmented debris washed southward from the Alburz range and has a medium sized texture. This zone extends from Tajrish in the north to the centre of Tehran near Khiaban-e-Sepah.

The third zone consists of calcareous and red soils averaging three to four feet in thickness, increasing in depth southwards where it has been extensively used as brick clay in the southern parts of the city. Here the surface soil is of a very fine texture and although such limitations as salt, sand dunes and shortage of water are present, it is moderately fertile and two of the most fertile areas of

FIG.1.2 TEHRAN IN ITS PHYSICAL SETTING.



SOURCE: AHRENS, P.G. 1966.

Tehran's plain, Varamin and Shahriyar are situated here. This zone continues to the Kavir. Salt accumulation is helped by the various anticlines which dam up the ground water to produce salt marshes.³

Although the plain on which Tehran has grown has one of the most gentle gradients of the southern Alburz, a clear north-south gradient is nevertheless apparent. Thus, in Tajrish in the north the height of land is 1310 m. and decreases to 1100 m. in the south near the railway station, 15 km. away. In other words there is a 13.5 m. decline per km. in a north-south direction. Such a tendency together with the particular texture of the soil, has resulted in natural water drainage for the northern and central built up areas of Tehran and is the main reason why Tehran has not been provided with a sewerage system. (See chapter 4: Sewerage Disposal). This altitudinal difference between the north and the south provides a basis for a great many contrasts in urban functions and morphology as will be shown later.

Climate

The interior of Iran is an almost entirely enclosed plateau, bounded by mountainous areas which are generally characterized by cold winters and mild summers, whilst in contrast internal basins have a much warmer climate. The precipitation regime on this plateau is of the Mediterranean type, with a winter maximum and a summer minimum.

The climate of Tehran includes most of the above

mentioned features. With the exception of winter and early spring, aridity predominates in the rest of the year. Winters in Tehran are fairly cold and long, starting at about the beginning of December and continuing to mid March. Exceptional cold caused by Polar Continental fronts, may keep the ground frozen for several weeks. The minimum temperature may drop to below -15°C . Most of Tehran's precipitation falls in this period, and is largely of a frontal type associated with cyclonic activity. To the north of the city, precipitation is mainly in the form of snow and remains as such until mid June, and produces the main resources of both under-ground and surface water in the Tehran area.

Spring in Tehran is often short, the precipitation falling mainly as rain and being convective in nature. Compared with winter, the intensities over short periods may be much greater though the total amount is less. The heavier precipitation which occurs at the higher elevations also falls as rain, this together with the higher short-period rates of intensity, results in a greater risk of flood damage in spring, which is intensified by melt-water from the Alburz (see Chapter 4: Flood Control).

Summer in Tehran is very hot and dry, with monthly mean temperatures throughout the season above 20°C . Rainfall is rare and humidity is very low. As a result city life is very uncomfortable and people have traditionally retreated to the cooler, northern suburbs. Local wind eddies especially in the southern suburbs are not uncommon and in the afternoons

often cause dust storms.

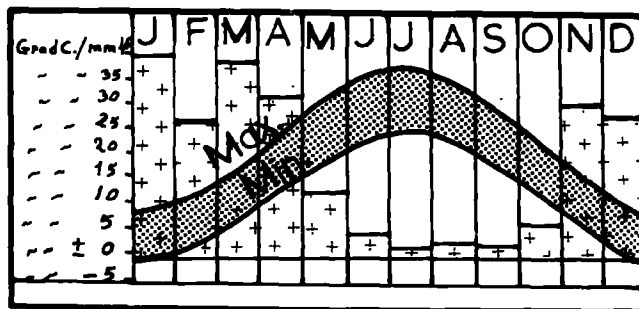
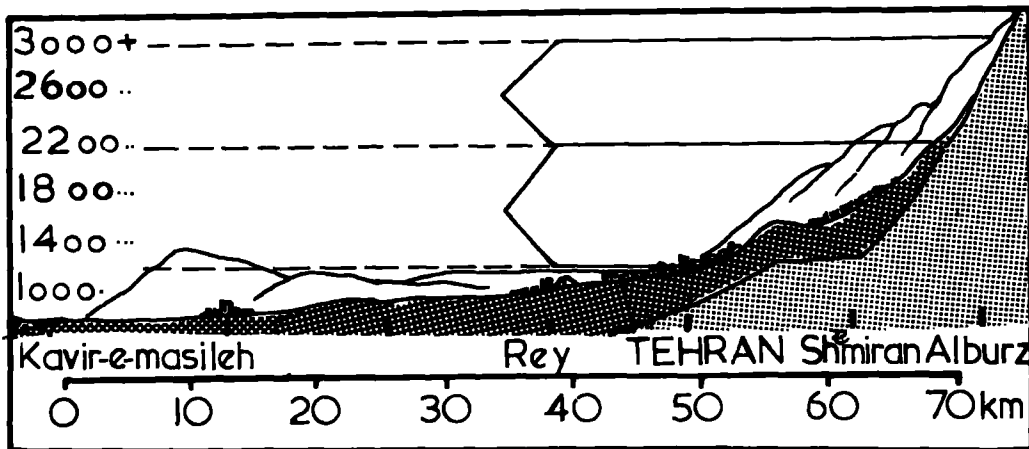
Autumn like spring is a short season, usually commencing about the beginning of October and lasting till the end of November. It is fairly mild and the daily temperature in October ranges between 16° - 18° C. which produces a favourable climatic condition. Towards the close of autumn westerly winds gradually provide some rain and the sudden reduction of temperature heralds winter's approach.

Tehran is affected by two types of winds, macro and local. The macro winds are largely the result of Polar-Continental air masses, which are dry and cool in winter and dry and hot in summer. They may be moderated by westerly winds which are humid in nature and originate in the Eastern Mediterranean.⁴ The direction of local winds in Tehran is shown in figure 1.3 and shows a circular distribution of wind frequencies with a westerly bias. Such westerly winds dominate from October to May and occur in the afternoons, reaching generally higher speeds in March, when seasonal changes are becoming evident. In contrast summer winds have a predominantly south-east direction and are locally called 'Khar' and 'Varamin'. As a result of their passage over the Kavir, they usually provide dust and occasionally sandstorms.

A northerly wind is another type of local wind occurring in a Katabatic form. This in fact is a current of air over Tehran resulting from the juxtaposition of the Alburz mountains and the plain of Tehran. It usually blows

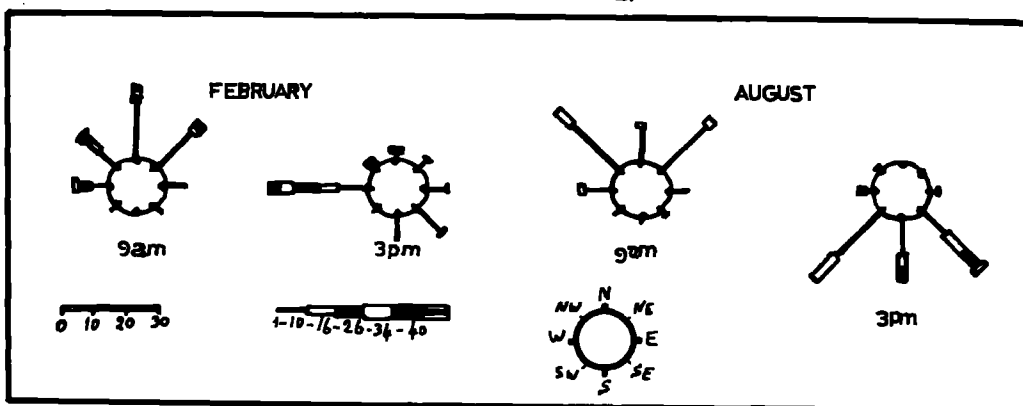
FIG. 1.3

PHYSICAL ASPECTS OF TEHRAN



+ + + RAINFALL

TEMPERATURE



SOURCE: AHRENS, P.G. 1966.

in the early morning throughout the year, and to some extent reduces the dust and summer's heat over the built up area of Tehran. Such a circulation in turn means that in order to get freshness and free passage of air through dwellings, the most desirable direction for houses in Tehran is at right angles to the dominant air-flow.

With regard to temperature, a north-south gradient is again apparent (see Table 1.1). This in fact is due to topographical conditions. Although absence of data inhibits a comparative study, a slight increase of temperature in recent years is apparent. This might be partly due to the reduction of open spaces and gardens around the city. As a general rule, winter is the cold season of Tehran with a mean temperature around 4°C . During this season the Polar Continental front may keep ground frozen in total for more than one month. By the approach of spring the temperature improvement is reflected in many aspects of urban life. One important example is the change in office hours which has important implications on daily journey to work and movement patterns within the city. In summer, Tehran suffers from temperatures as high as 42°C ., hence the traditional 'Yeilag' or migration to summer quarters results in the outward movement of wealthier Tehranis from the central part of the city.

The precipitation regime in Tehran as mentioned before, is of the Mediterranean type, with a winter maximum

TABLE 1.1:

**Climatic data for Tehran, Shemiran, Rey
and Karaj 1968**

	J	F	M	A	M	J	J	A	S	O	N	D
Average Temperature (°C)												
Shemiran	+1	+1	+8	+12	+16	+20	+23	+22	+18	+14	+5	+3
Karaj	+4	+5	+10	+16	+19	+23	+25	+25	+21	+11	+8	+4
Tehran	+5	+6	+13	+18	+22	+27	+29	+28	+24	+18	+7	+5
Rey	+5	+6	+15	+20	+22	+28	+30	+29	+25	+18	+7	+6
Maximum Temperature (°C)												
Shemiran	+14	+16	+19	+28	+30	+34	+36	+35	+34	+28	+20	+13
Karaj	+16	+17	+20	+29	+31	+36	+39	+37	+36	+28	+18	+14
Tehran	+16	+19	+24	+32	+35	+39	+42	+40	+38	+30	+22	+15
Rey	+19	+21	+27	+34	+36	+40	+43	+41	+39	+34	+24	+16
Minimum Temperature (°C)												
Shemiran	-12	-17	+0	+0	+3	+8	+9	+9	+6	+0	-10	-9
Karaj	-6	-9	+0	+1	+5	+11	+11	+12	+8	+0	-4	-4
Tehran	-5	-6	+2	+5	+9	+13	+15	+17	+12	+4	-8	-3
Rey	-4	-5	+2	+4	+7	+13	+14	+14	+9	+3	-8	-4
Rainfall (In millimetres)												
Shemiran	86	6	104	41	9	14	0	0	12	19	9	93
Karaj	26	10	62	28	5	8	0	0	0	5	55	55
Tehran	26	4	43	13	1	4	0	0	0	5	3	68
Rey	20	0	32	12	1	2	0	0	0	1	2	23

Sources: Min. of Roads, General Department of Meteorology,
Annual Meteorological Report, 1968.

and a summer minimum. It occurs mainly in the form of rainfall but towards Shemiran and the foothills of Alburz there is a tendency for snow. On the whole, the annual precipitation ranges between 200-250 m.m. and categorizes Tehran as a typical semi arid zone.

Lack of data on rainfall does not allow a comprehensive long term analysis of rainfall trends, but continuous data has been recorded at Mehrabad Airport, 6 km. west of the city, since 1943.⁵ (Table 1.2).

TABLE 1.2:

Mean annual precipitation at Mehrabad Airport

<u>Tehran 1943-68</u> (in millimetres)												
Winter		Spring			Summer			Autumn		Winter		Total
J	F	M	A	M	J	J	A	S	O	N	D	
35.3	26.5	30.3	30.7	13.5	2.3	0.5	1.5	1.4	6.2	25.8	26.1	200.1
% 44.0		37.1			2.2			16.7				100.0

- Sources: 1) Ministry of Roads, General Department of Meteorology, Annual Meteorological Report, 1968.
 2) Arid Zone Research Centre, Iranian Rainfall Data.

The above table shows the mean annual precipitation fall in Tehran for the period 1943-68. 44 per cent of Tehran's precipitation fell during December to February, 37.1 per cent from March to May, 2.2 per cent for June to August and the remaining 16.7 per cent occurred in autumn from September to November. Although a detailed comparison of the rainfall distribution patterns of Shemiran, Tehran and Rey is difficult because of the absence of comparable data the limited sources

indicate a clear difference in rainfall regimes thus showing the topographic influence of altitude on rainfall distribution (Table 1.2). Considerable annual fluctuations in rainfall are also apparent with 289 m.m. in 1904 but only 91 m.m. in 1917.⁶

Winter precipitation is largely of the frontal type associated with cyclonic activity. It is steady but as a whole is less intense than in spring although in total amount it is greater. Spring rainfall is much more convective in nature, although the total amount might be less, the intensities over short periods are much greater, resulting in a risk of flood damage in spring.

The tremendous expansion of the city in recent years has not only produced effects on the natural physical environment but has also had a significant effect on the local climate. The development of large built up areas has decreased the ability of the ground to absorb natural surface water by the covering of large areas with asphalt and concrete. Natural flood courses have been partially infilled (see chapter 4: Flood Control), and artificial diversions have increased erosion. The pollution of the atmosphere especially by the motor-car, industries and dust from the activities of people, combine with dust brought from the south to produce an unhealthy "artificial" environment, especially during the summer. Temperatures in central Tehran are significantly higher than temperatures in Karaj and even though altitudinal differences may influence this, it is possible to state tentatively that Tehran is

producing temperature differences as a result of urban activity. (see Table 1.1). Pollution is less intense to the north as a result of the presence of large planted areas which include parks, gardens and open spaces but in the south, because of the lack of open spaces, and the concentration of industry, pollution is very severe.

Notes and References

1. 'qanat' is a Persian term for an under ground tunnel which leads water by gravity flow from beneath the water table at its upper end to a ground surface outlet and irrigation canal at its lower end.
2. Riben, H., 'The Geology of the Tehran Plain.' American Journal of Science, Vol. 253, Pp. 617-639., 1955.
3. Bobek, H. 'Teheran', Geographische Forschungen Schlern Schriften, Band 190, P.9., 1958.
4. Ganji, M.H. Climate of Iran in the Land of Iran. W.B. Fisher (ed.) Cambridge. 1968.
5. Arid Zone Research Centre, Iranian Rainfall Data. University of Tehran, 1960.
6. Bobek, H. 1958, Band 190 op.cit. P.12.

CHAPTER 2

THE HISTORICAL DEVELOPMENT OF TEHRAN

At the present time it is fashionable in many geographical quarters to question the necessity of including a study of historical processes in an understanding of contemporary urban areas. In the case of Tehran however a very strong case can be made as to why this approach should be included on two grounds. Firstly the history of Iran has had important repercussion on the functional development of Tehran as the nations capital whilst secondly the physical evolution of the city has been closely related to the outward growth from the historic core. Whilst this area now appears small in comparison with the vast sprawling suburbs it still exerts a considerable influence, in both a functional and morphological sense on any understanding of the spatial contrasts that exist within the city.

In a study of the origin and historical evolution of Tehran three distinct periods of development may be distinguished. These periods are:

- a) Pre 1796.
- b) 1796 to 1925 (Qajar period).
- c) 1925 onwards (Pahlavi period).

a) Pre 1796

Compared with many other cities of Iran, such as Hamedan and Esfahan, Tehran does not have a pre-Islamic

history. However near to present day Tehran, was the ancient flourishing city of Rhaga (Rey) and its influence on the growth of Tehran is an important historical factor. Situated only 10 kilometres to the south of the present day city, numerous archaeological excavations have uncovered one of the earliest periods of settlement in Iran, called Cheshmeh Ali dating from 5000 B.C.

Although there is no evidence of settlement at Tehran during this period, there is no doubt that the northern gates of ancient Rhaga were located on important highways which probably led towards the lands of Tehran as developed in the post-Islamic period. Being located on such a route could have been a reason for the further growth of satellite settlements near the important city, and Tehran was one such satellite which eventually replaced the Median glories of Rhaga.

Most historians believe that the post Islamic growth of Tehran is closely linked to the decline of Rey. Because of this relationship, a brief account of the development of Rey is necessary. Following the Arab conquest in 642 A.D., Rey was entirely razed and a new quarter built by the Arab governor to the east of the earlier city. Under the Abbasid caliphs (7th century) it was greatly extended eastwards, its name being changed to Mohammedieh, and some Islamic geographers, such as Mustoufi, give apparently exaggerated accounts of its importance.¹ It was rebuilt during the Dylamid dynasty (11th century) after a terrible earthquake, and under the Saljuqid dynasty (12th century)

it regained its pre-Islamic importance. At this stage, the centre of gravity of the city, exemplified by the citadel which housed the administrative functions, was shifted to its pre-Islamic site. This was to the north-west where because of better climatic conditions and the availability of water resources this district was occupied by the Saljuqid governors and the high-class residents, as it had been in pre-Islamic times. According to Kariman,² the city population had increased by the mid 12th century to 1.5 million and the area of the city within the wall was 1.5 square 'farsakh', nearly 80 square kilometres.³ It was the most important administrative and commercial centre of the region, and its location on important highways (such as the Silk road and the Indian highway) gave it further significance. Numerous large bazaars in the city were served by the large caravanserais located both inside and outside the city gates. By the medieval standards of Iran, Rey had risen to be one of the most important market and exchange centres of the country. Mustoufi points out that Rey and the surrounding area was divided into four districts which included 360 villages, with Tehran as one of the most developed ones (Mustoufi 1919 p.59). At this time Rey was at its most important, before the Mongol hordes pulled the city down in 1221 A.D.

As indicated, the decline of Rey was a major reason for the initial development of the surrounding satellites, which included Tehran, whose later growth occurred at the expense of other centres in the neighbourhood. The earliest

settlements on the site of Tehran cannot be accurately dated, but it is certainly mentioned by Ibn Balkhi about 1100 A.D., and both he and Ali Samani in 1160 A.D., praise its fruits, especially its pomegranates.⁴ No other information is available until the account by Yaqut in the 13th century.⁵ He describes Tehran as a large village with 12 quarters, surrounded by dense gardens which were suitable for the defence of the village. In 1270 Yaqut and Qazvini both point out that there were subterranean dwellings in Tehran. In the 14th century Mustoufi states that Tehran was a famous town producing similar products to Rey but with a better climate.⁶ In 1404, during the reign of Timurlan, Tehran was visited by Clavijo, probably the first European visitor, who described it as a large and delightful un-walled town.⁷ Changes came to Tehran under Shah Tahmasb I of the Safavids, (1524 to 1576) who ordered an 'Arg' (citadel) and a bazaar to be built in 1553 and he surrounded the whole settlement with an earth wall.⁸ According to Mumford's ideas, having a wall in medieval times was an important factor in granting a settlement the status of city. Accepting this hypothesis it can be argued that Tehran had reached the status of a city by this time. Other factors, mentioned by different historians, such as Itemad-ul-Saltaneh, have helped to confirm this status. These include, being in the neighbourhood of the tomb of Shah Tahmasb's predecessor, the latter's interest in shooting places around Tehran, and most important of all the strategic location of the settlement to the east of Qazvin, the current Safavid capital.⁹

Although there is no doubt that the above factors were important, Khosravi points out that the most effective factor in changing the rural characteristics of Tehran was a considerable increase in its population together with commercial and administrative development. Historical evidence shows that Tehran served as a garrison town, and as such received greater consideration, becoming the seat of a Biglar Begi during the reign of Shah Abass (1587 to 1629).¹⁰

Della Valle, who visited Tehran in 1618, called it a "town of plane trees, and described it as being larger in area than Kashan but with a smaller population. He added that built-up areas accounted for no more than one third of the town, the remainder being under gardens". Nine years later in 1627 Herbert estimated 3,000 houses in the town, of which the governor's house and the buildings of the Bazaar were the finest.¹² However, as the town's economy was based mainly on small scale trading and gardening, its growth continued to be slow for over 200 years. Indeed by the early decades of the 18th century the Afghan invasions, together with epidemics and famine, saw Tehran enter a period of decline.

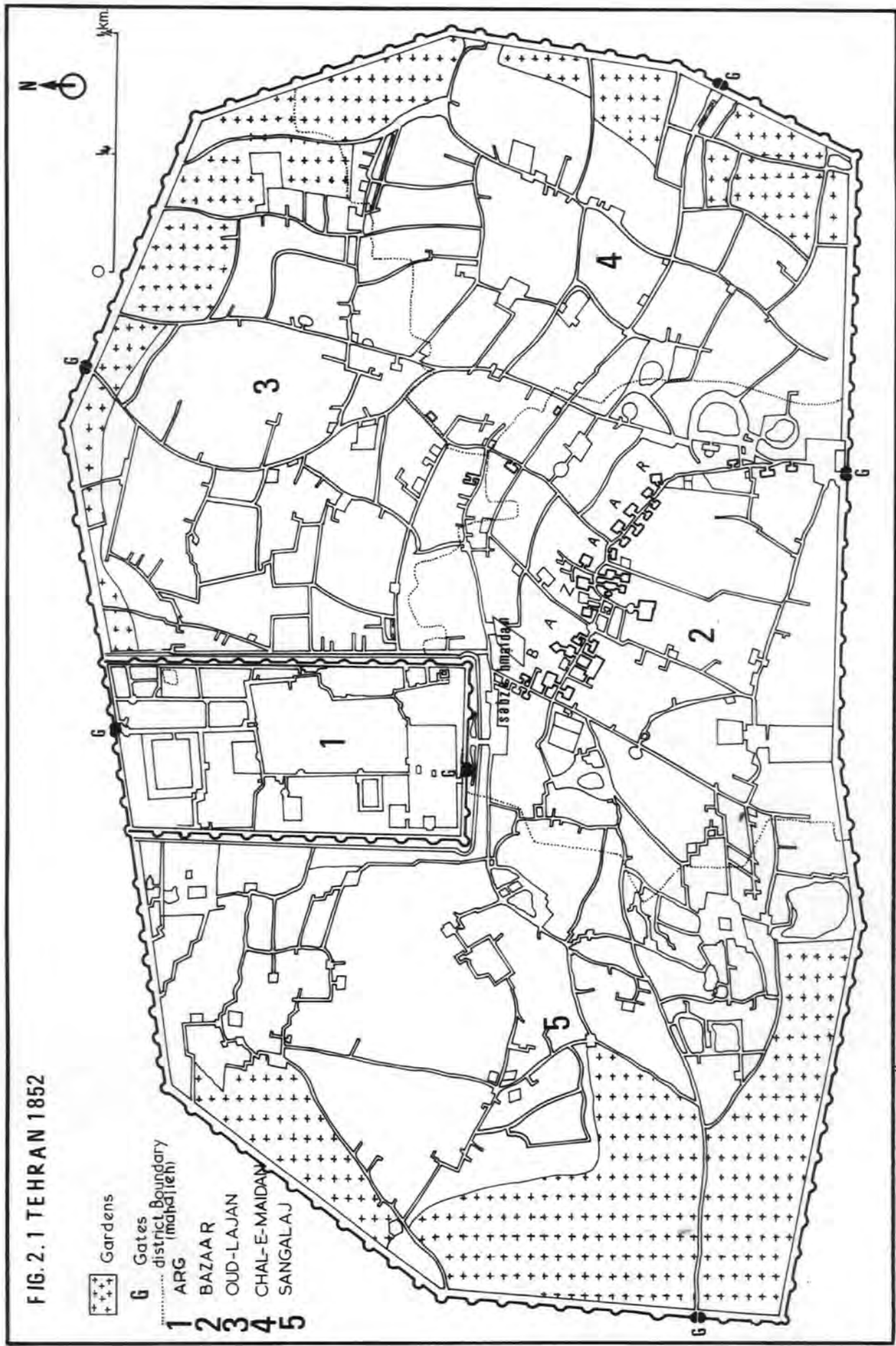
In 1759 Karim Khan Zand recognized the strategic location of Tehran. He rebuilt the wall of the town, which had been demolished during the Afghan invasions, with the aim of making it his capital. Thus the town was provided with various government establishments, although he later moved his capital to Shiraz.

b) Teheran from 1796 to 1925 (the Qajar period)

In 1796, for the same reasons as already mentioned the founder of the Qajar dynasty was attracted to choose Tehran as the national capital. This choice could be considered as a major watershed in its historical growth, but due to a period of neglect it was not fully prepared to meet the requirements of a capital. The repairing of the city wall and the Arg, and the beginning of the construction of the Qasr-e-Qajar (the Qajar palace) were the only developments during the reign of Agha Mohammad Khan Qajar (1796 to 1798).

According to Oliver's account only half of the city was then built up.¹³ Its population was no more than 15,000 of whom 3,000 were soldiers, and its area was approximately 7.5 square kilometres. It was divided into five districts, surrounded by the same hexagonal wall of the 16th century. Residential areas occupied the entire eastern part of the city within the mahallehs of Oud-Lajan and Chal-e-Maidan. To the south was the commercial district, in which the Bazaar was located, and known as the mahalleh-e-Bazaar. The royal residence and the administrative centre were located in the Arg, to the north, in the mahalleh-e-Arg. The whole of the western section of the city, known as the mahalleh-e-Sangalaj, was either unused or under gardens (see Fig. 2.1). In the first decade of the 19th century changes were few and only a small number of public buildings were constructed. In 1811 Ouseley mentions that in the city there were six gates, thirty mosques and schools, 300 hammams

FIG. 2.1 TEHRAN 1852



SOURCE: BEREZIN, "TOWN PLAN OF TEHRAN" 1852.

(public baths) and one maidan (square) located to the south of the Arg.¹⁴ The few major streets in the city were those connecting the Arg to the city's gates. The other streets were mostly unpaved and dusty kutcheh (alleys) and cul-de-sacs. The proximity of the Arg and the bazaar was not an incidental matter for the city's revenues to the government came chiefly from the bazaar and for safety and convenience it was therefore useful for the Arg and the bazaar to be close to one another. Similar contiguous locations also occurred in other Iranian cities such as Esfahan and Kermanshah.¹⁵ One can conclude therefore that a focal point of growth for Tehran in the 19th century was between the Arg and the bazaar, the area which now covers that part of Tehran known as Sabzeh Maidan (see Fig. 2.1). It must be emphasised that at this time the tribal element in the country tended to reduce the effectiveness of the political centrality of Tehran, whose status was always at risk with provinces enjoying a significant degree of autonomy.

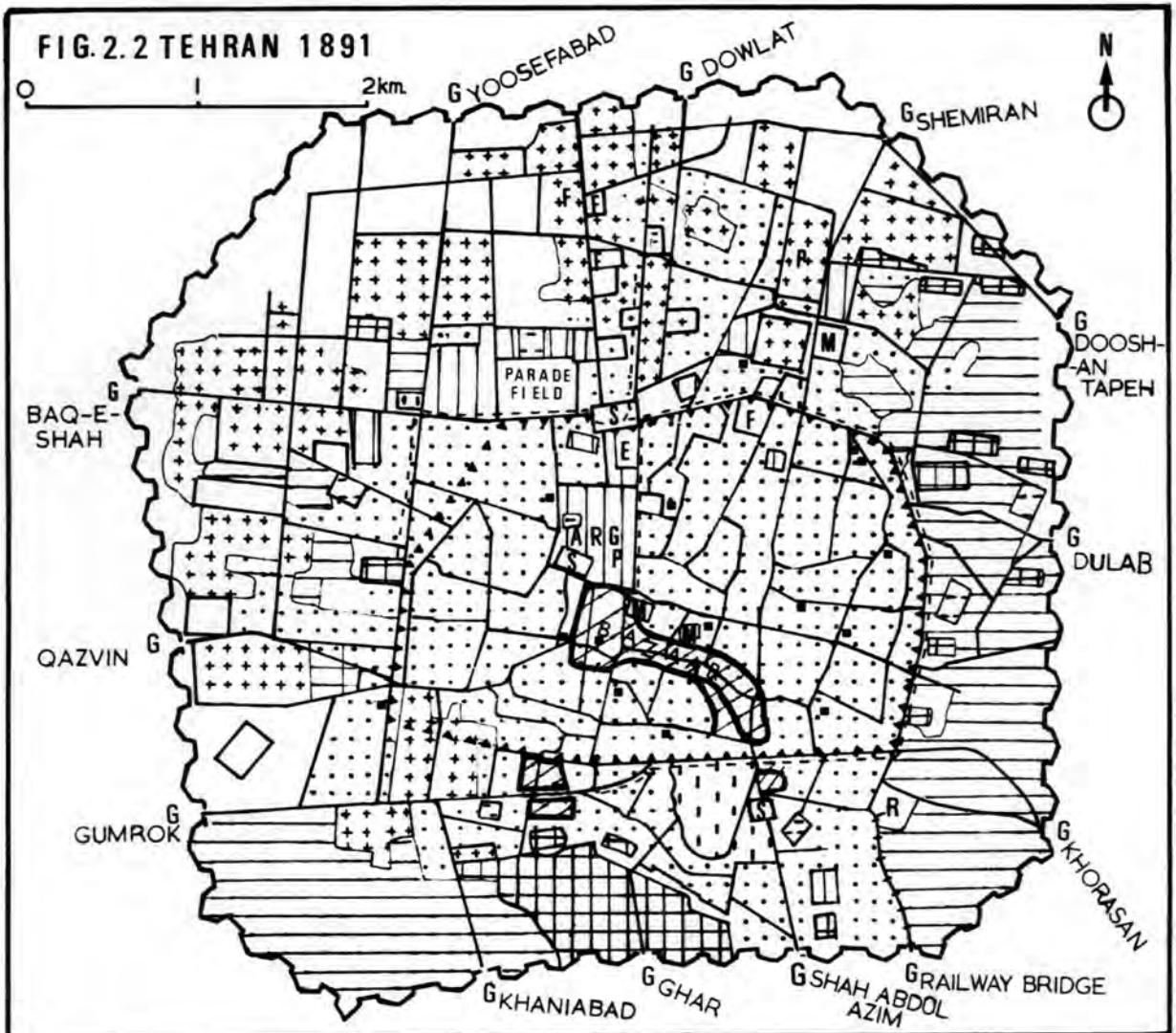
Further changes were made during the reign of Fath Ali Shah, since he was a ruler with luxurious tastes and ruled for a considerable length of time (1798 to 1834). The Shah Mosque was built and the Qasr-e-Qajar was completed, and other palaces were constructed both inside and outside the city walls. The ones outside served mainly as summer residences. This trend of palace building was followed by the relatives of the monarch and by the upper echelons of Persian society as a whole, people such as tribal chiefs

and large landed proprietors. The city now began to take on a new shape. Its importance, relative to other major Persian cities increased through contact with foreign countries and the subsequent establishment of foreign legations within Tehran itself.

During the mid 19th century the most important problem that the city faced was a shortage of water, a result of the ever-increasing population, which by this time had reached 60,000. Several new qanats were constructed and a canal from the Karaj river was built in an attempt to alleviate the situation. In this period the various contacts with foreign countries brought improvements in the military, manufacturing and educational spheres of the economy, the latter being exemplified in the establishment of the Royal college of Daralfonoon (College of Science and Technology). By the 1860's further population increase saw the development of new built-up areas, particularly marked in the north, where permanent settlement had extended beyond the city walls.

The early 1870's saw a rapid expansion of Tehran. The old ditch was filled in, and the bulky wall which had stood from the 16th century was pulled down, and a new octagonal-shaped wall, modeled after the Paris fortifications replaced it. The new wall, which was three-times the length of the previous one had twelve gates and enclosed an area of approximately 20 square kilometres. It included all of the recent built-up areas, together with the Negaristan Palace, to the north of the city. (See Fig. 2.2). The extension of the industrial areas was more concentrated around the

FIG. 2.2 TEHRAN 1891



	AGRICULTURAL LAND		GOVERNMENT BUILDING
	GARDENS		ARMY BARRACKS
	CEMETERIES		INDUSTRIAL AREAS
	VACANT LAND		STREET NETWORK
	RESIDENTIAL AREAS		HORSE TRAMWAY
	COMMERCIAL "		RAILWAY
P	PALACES	R	RAILWAY LAND
E	SCHOOLS	S	SQUARES
M	MOSQUES	G	GATES
■	PUBLIC BATHS	▲▲▲▲	WALL OF 1553
F	FOREIGN ESTABLISHMENTS	~~~~~	WALL OF 1873

AFTER MAP OF ABDOLGHAFFAR.

Shahabdolazim gate, which connected Tehran with the southern provinces; the GÜmrük (Customs) gate connecting Tehran with the west of the country; and the Khorasan gate at the eastern end of the city. The availability of suitable earth on the southern outskirts of the city was largely responsible for the increase in the number of brick kilns established in that area.

The northern development was the most significant feature of this rapid extension. Several foreign representatives who had previously rented accommodation in the old town, moved northwards and acquired large estates in the new district of Döwlat (Mahalleh-e-Döwlat). The most developed area within this district was on either side of the newly built street named the Boulevard des Ambassadeurs (the present day Khiaban-e-Ferdowsi). This area, which was initially settled by Europeans soon attracted high class Tehranis and remained a first class residential area for many years. This area was outside the boundaries of the old city, and had the advantages of a better climate and also greater proximity to purer water resources. The physical distance between these residential areas and the bazaar became greater, resulting in the emergence of a new type of shopping area along the Boulevard des Ambassadeurs, with an increased emphasis on foreign-type goods.

To the south the extension of the wall incorporated all of the former brick kilns, ice-making factories, and the old cemetery, and led to a transfer of these activities to more suitable areas outside the newly constituted city

boundary. This process was accomplished gradually as residential building gained in priority, within this sector of the city. The new palaces and gardens which had been built outside the city walls also had their effect on the city's development. For instance two good roads were constructed from the central administrative district of the city (the Arg) to the summer residence of the Shah in Shemiran (1870's). At the same time the construction of other public establishments such as the Sepah Salar mosque and the Railway Station (1880's), together with various maidan (squares), Maidan-e-Tupkhaneh, Maidan-e-Mohamadiyeh, and Maidan-e-Amin Sultan, added to the city's attraction. Now there were several horse tramways connecting the foreign establishments within the Mahal^{leh}-e-Dowlat with the administrative centre (the Arg) and facilitating communication with other parts of the city.

At the close of the 19th century Tehran had expanded sufficiently to have outstriped any other city in the country. It had, by now, gained some aspects which were reminiscent of European cities, and communication facilities had been improved. Improvements in the social field, such as ministerial reform, and the foundation of educational institutions and the improvement of existing facilities, were the direct outcome of two tours to Europe by Naseradin Shah. The long reign of this ruler (1848-96) provided a good opportunity to establish the position of Tehran as the capital city, and by the end of the century the city's rapid development was remarkable even to European visitors.

Curzon remarks "Shops are seen with glass windows and European titles, street lamp-posts built for gas ... avenues bordered with footpaths and planted with trees recall faint memories of Europe."¹⁶ Growth was continued under the new monarch, Mozafaradin Shah who reigned from 1896 to 1906.

Throughout the 19th century the country was subject to a quasi-feudal system of government, encouraged by the presence of relatively autonomous tribal groups and provincial leaders, and in order to gain political influence at the provincial level, it was necessary for them to contribute considerable payments to the Shah. This proved a continuous drain on provincial resources, to their detriment but resulted in the concentration of a considerable proportion of the national income within Tehran, an important factor in its development. By the early 20th century the population of Tehran was estimated at 250,000. Following the Constitutional revolution of 1906, and the subsequent establishment of a legislative assembly, (the Majlis) Tehran gained greater importance as the political and intellectual centre of the whole country. Like other parts of Iran, Tehran suffered during the second decade of the 20th century, and insecurity resulted in chaos, stagnation, and neglect.

6) 1925 onwards (the Pahlavi period)

Under the rule of Reza Shah, who came to power after the fall of the Qajar dynasty, and whose reign lasted from 1925 to 1941, Iran entered a period of political stability in which general improvements were made throughout the

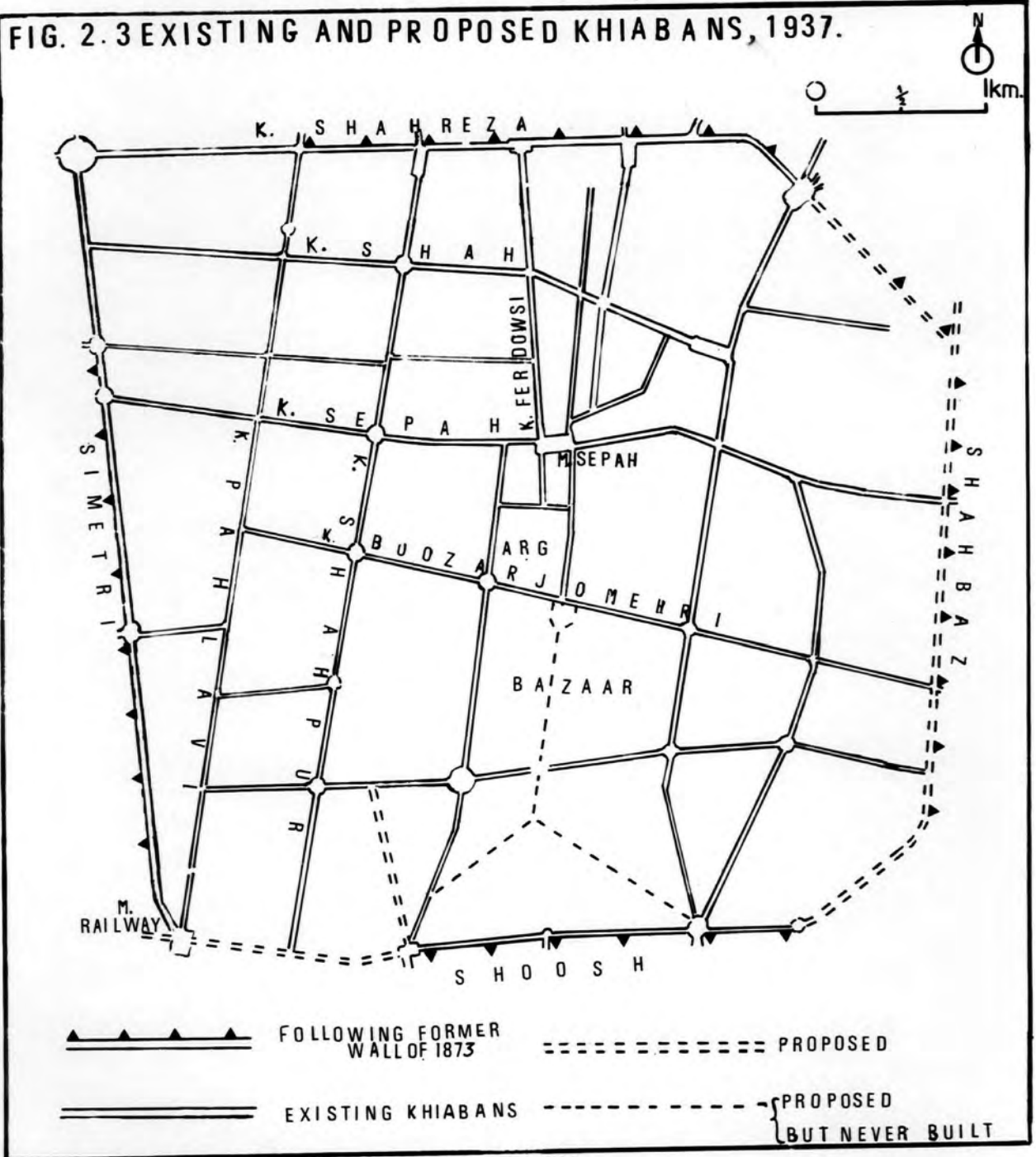
country and more especially in Tehran. All state affairs were concentrated in Tehran. The number of civil servants increased rapidly and administrative affairs were dealt with in the capital. Thus the city developed a new major function, that of administration. Since the city was still closely inter-connected with the bazaar and the majority of applicants to the newly established government agencies were from the bazaar and the business sector, the main buildings of the new administration were located in the area of the Arg, where the old political functions used to be carried out. It is from this date that the old socio-economic system entered a period of gradual decline, and the inhabitants become increasingly divided into various classes. The administrative function soon became the most important of the city's functions, and consequently the number of civil servants and government employees increased rapidly. This new class of inhabitants had more freedom of choice in selecting a place of residence, and began looking towards the northern parts of the city. These northern parts had better climate, more accessible water resources and less congestion than the city centre. Development of communications, such as better roads during the reign of Reza Shah, and the motor car, served as factors in accelerating this extension and movement. The Shah devoted all his efforts to developing and modernizing Iran. He brought about fundamental changes in the physical structure of the capital, based on a western model exemplified by Paris under Napoleon III. This was reflected in the construction of wide and straight khiabans,

such as Khiaban-e-Pahlavi and Khiaban-e-Shah, and geometrical maidans, such as the Railway maidan (see Fig. 2.3).

The various development programmes were the direct outcome of an increase in gross national production and a general improvement in the economic stability of the country which led to a new period of urbanization. As a result of political and commercial centrality, Tehran greatly prospered and for the first time an effective municipality came into existence in the 1920's. The new municipality could to some extent provide the city with the initial demands for public utilities such as electricity, piped water, and asphalted roads. Urban development and renewal was initiated by the clearance and the re-construction of slum areas in the centre and north-western parts of the city, (Mahalleh-e-Sangalaj). At the same time a new network of avenues and streets was started to be built. As Kayhan has stated, there were more than 1.8 square kilometres (9% of the whole city) devoted to thoroughfares and maidans.¹⁷

The construction of very impressive administrative buildings together with several palaces in a quasi-European style, were the most typical establishments of this period. Other constructions, in a pre-Islamic style, such as the Police Headquarters and the Ministry of Justice, reflected the nationalistic interests of the new ruler. The wall of the Arg, some of the royal palaces and administrative establishments of the Qajars were pulled down and large open areas, such as the Parade field (Maidan-e-Mashq),

FIG. 2.3 EXISTING AND PROPOSED KHIABANS, 1937.



SOURCE: MUNICIPALITY OF TEHRAN.

provided good opportunities for the location of new administrative and commercial buildings very close to the centre of the city (See Fig. 2.2). A number of Royal Palaces together with public facilities such as museums, spacious squares with fountains and new shopping centres added to the city's attraction.

Industrial development proceeded apace. Considerable capital was invested by both the state and the private sector to establish a new series of manufacturing industries, such as flour milling, sugar refining, and chemical and cement production. These activities absorbed a large number of migrants from other parts of the country, especially from the north-western province of Azarbaijan.

Parallel with this expansion was the continual and still continuing problem of water shortage. The 33 qanats of the Qajar period were the only water supply to the city until the late 1920's. In 1927 following a dangerous shortage of water, various schemes were considered to remedy this deficiency, resulting in the construction of artesian wells and a 52 kilometre canal bringing some of the waters of the Karaj river to the north-west of the city. This latter project cost more than £20,000 and was capable of delivering 1.3 cubic metres per second, which was only sufficient for a few years because of the continuing rapid increase in demand.

With regard to other aspects of development, the first University in the country was founded in Tehran in 1935, together with other educational institutions, such as a Teachers' Training College, and a Military college.

This further emphasised the fact that Tehran was the educational and cultural centre of the whole country. In 1937 the city wall was pulled down as a result of the great increase in the population, which by this time had reached nearly half a million. The previous lines of the city walls were replaced with broad and straight avenues which now form the principle streets of present day central Tehran (See Fig. 2.3).

After the Second World War and particularly after 1950, under Reza Shah's son, the present Shah, the relative economic growth of Tehran was shown in the provision of more jobs and greater employment opportunities, and the attraction of numerous people from other parts of the country. Little by little, the increase in per capita income encouraged more and more middle class families to move their residence to the periphery, especially in a northerly direction. Some of the bazaaris (wealthy merchants) and higher civil servants remained near the city centre because they wanted to preserve their social attachments, such as their popularity, as well as their proximity to their work places in the bazaar and the various ministries. After 1950, however, upper class families also showed a tendency to settle in new houses in the northern part of the city. The large houses of merchants and businessmen were occupied, after their transfer to the northern part of the city by lower income families, and after repetition of this process, many such houses which were once the residence of only one family, are now the dwellings of several families with very

low incomes. Such large houses, which are still in existence today, are mostly situated around the bazaar. Some of these houses because of their dilapidated character, are no longer dwelling places, whilst others have been demolished. As land prices in this area have risen sharply, plots have been used for the erection of large business centres or administrative departments (such as on Khiaban-e-Naser Khosrow and the northern and southern streets of Park-e-Shahr the city park.

The townscape in the northern part of the city especially along Khiaban-e-Shah Reza had changed rapidly and the municipal authorities had paid particular attention to it. It had evolved into a business as well as a residential area. This was a major reason for the shift of the centre of gravity further north. By the late 1950's the administrative-commercial sector and the residential sector showed signs of distinction, a trend more in evidence in the 1960's. The administrative-commercial centre extends along Khiaban-e-Ferdowsi, Lalehzar, and Saadi. New shopping centres were also established to meet the requirements of the northern inhabitants, in Khiaban-e-Takht-e-Jamshid, and along the two main roads leading to Shemiran and the one leading to Amirabad. Residential areas extended from Khiaban-e-Shahreza northwards to Abbasabad, and later to Shemiran. Industrial development has not been confined only to the southern part of the city, for new industry has been located along the main roads to the west and the east, leading out of the city to the provinces. At these locations the industrial concerns have acquired less expensive land on

larger sites for the erection of factories. Because of their location near major routeways the exchange of raw materials and of manufactured goods was facilitated, not only with Tehran but also with the provinces.

Growth has proceeded unabated, but it is hoped that, with the completion of a Comprehensive Plan for Tehran (1966 to 1991) the municipal authorities will be able to direct growth. Development Planning in Iran dates from the immediate post-war period. The First Seven Year Plan was initiated in 1948 and involved an expenditure of 6 billion rials. A Second Seven Year Plan was introduced in 1955 with a proposed expenditure of 70 billion rials. Experience gained through the operation of these two plans gave more significance to the Third and Fourth Five Year Plans (1962 - 1967 and 1968 - 1972 respectively). The Fourth Plan appears to have been extremely successful. The aims of this last plan are given in the introduction to the plan;

"the foundations for economic and social development will be so solidly laid that poverty and ignorance are completely eradicated in Iran, and that future generations will take their rightful place among the prosperous and progressive nations of the world".¹⁸

Notes and References

1. Hamdullah Mustoufi, "The Geographical Part of the Nuzhat-al-Qulub", ed. G. Le Strange, London, Leyden, 1919, P.59.
2. Kariman, H. "Rey-e-Bastan", P.18 Tehran (Farsi) 1345 (1966).
3. Farsakh is a Persian measure of distance equivalent to 6 Km.
4. Ibn-e-Balkhy, "Farsnameh", ed. G. Le Strange, London 1921 P.134 E.J.W. Gibb Memorial Series Persian text.
5. Early writers. Quoted by Minorsky, V. "Tehran, Capital of Persia", Encyclopedia of Islam, 1934, Vol. II, PP.713-720.
6. Minorsky, V. 1934, Ibid. P.715.
7. Clavijo, Don Ruyde. "Embassy to Tamerlane". Trans. G. Le Strange, Chap. 9, P.167. London 1928.
8. Itemad-ul-Saltaneh, Muhammad Hasan Khan, "Merat-al-Buldan" Vol. 2, P.511. (Farsi). 1295AH (1878).
9. Itemad-ul-Saltaneh, Ibid. P.511.
10. Biglar Begi, A term used in smaller settlements for the governor at that time.
11. Della Valle, Pietro, "Voyages". Trans. Coulon and Clouzier. Suite, PP.390-91. Paris 1664.
12. Herbert, T. "Travels in Persia 1627-29". PP. 194-195.
13. Oliver, G.A. "Voyage dans l'Empire Othoman, l'Egypt et la Perse". Vol. 5 pp.91-92, Paris 1807.
14. Minorsky, V., op.cit. P.718.
15. Hakami, M. "Historical Sociology of the city of Tehran in the First Seminar on Study of the Social Problems of the city of Tehran". Publication No. 21, Institute for Social Studies and Research, University of Tehran, Sept. 1964. P.13. (Farsi)
16. Curzon, G.N. "Persia and the Persian Question", Vol. 1, P.306. 1892.
17. Kavian, M. "Jografya-ye-Mofassal-e-Iran". Vol. 2 P.236. (Farsi). 1932.
18. The Imperial Government of Iran Plan Organization, 4th National Development Plan 1968-72., 1969.

CHAPTER 3

THE POPULATION OF TEHRAN

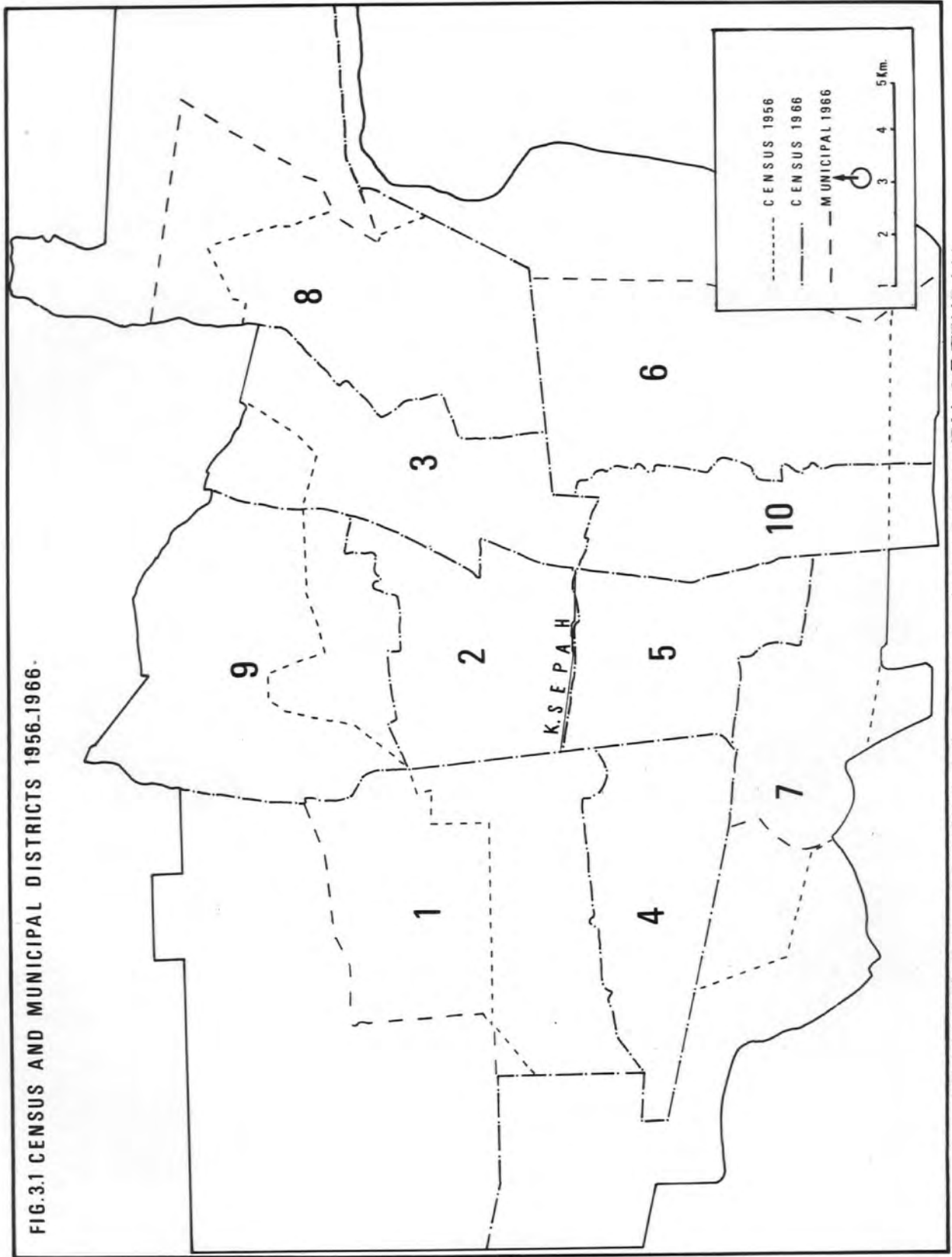
The population of Tehran has been subject to a very rapid increase during recent decades; a fifteen fold increase in fifty years, from an estimated 200,000 in 1921, to three million in 1970.¹ Such rapid growth is mainly due to the acceleration of net immigration from the rest of the country, natural increase and to some extent the engulfing and annexation of rural and sub-urban areas by the city.

The census boundary of Tehran in 1966 differed from that of the municipal boundary, as it included additional areas to the east and west (Fig. 3.1). For enumeration purposes the city in 1966 was divided into ten major districts. These census districts conformed with municipal districts in the central part of the city, but differed on the periphery. These districts will be constantly referred to in this chapter.

When various aspects of population ~~are examined~~ are examined, a significant contrast appears between the southern and northern parts of the city. The boundary separating these two parts runs roughly through Khiaban-e-Sepah, reflecting the dividing line ~~in age group composition~~ in age group composition, sex ratios, employment characteristics and literacy.

Due to the increase in the size of Tehran, the northern suburb of Shemiran, and the southern suburb of

FIG.3.1 CENSUS AND MUNICIPAL DISTRICTS 1956-1966.



SOURCES: STATISTICAL CENTRE OF IRAN & MUNICIPALITY OF TEHRAN.

Rey have now become part of the metropolitan area of the city. They must therefore be included in a study of Greater Tehran, particularly as Shemiran has now become a commuting residential suburb of the city. Certain statistical problems however are difficult to reconcile because their populations have been enumerated separately.

To study the population ~~characteristics~~ of a city as large as Tehran, detailed fieldwork could only cover selected areas and topics. Hence the official censuses are used as a basic source. Unfortunately no comprehensive census data has been produced for Iran until recently. The First National Census was undertaken in 1956, followed by the census of 1966. These census reports are used intensively in this study, although one must always bear in mind their limitations, and other sources of information have been utilized where available.

The first part of this chapter examines the ~~historical~~ evolution of the population, as a background to the recent trends in population growth. This is followed by an attempt to analyse other aspects in so far as they represent broad features of a demographic and socio-economic nature which help to explain contrasts between different parts of the city.

The Historical evolution of the population of Tehran.

As already mentioned no reliable census data was produced in Iran until 1956 and any study of the population

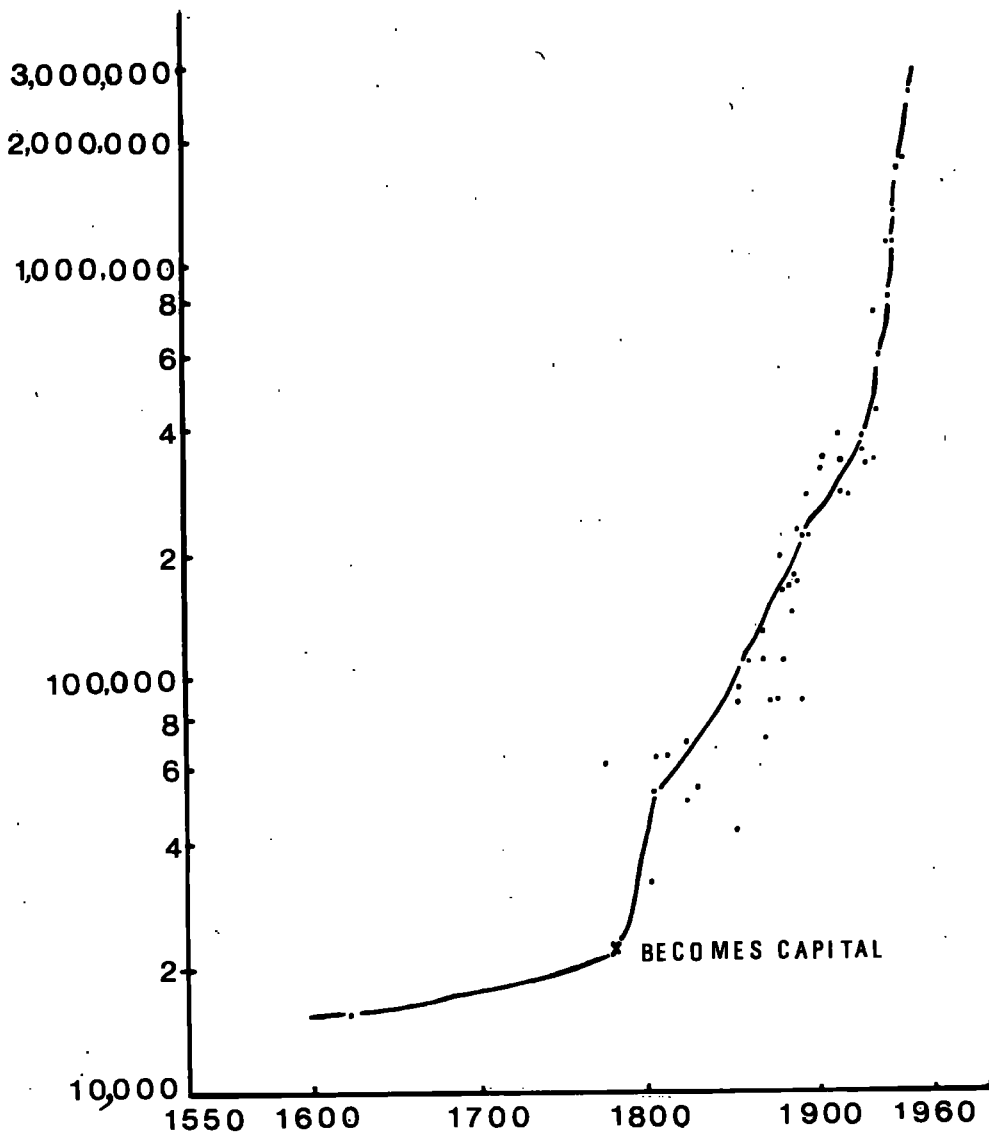
prior to the post-war era is therefore limited to two chief sources. First some official figures of limited accuracy, published for certain major Iranian cities² and secondly studies of pre-twentieth century population from the estimates of contemporary historians and foreign travellers. (See Fig. 3.2 & Appendix 1)

The data shows that in the sixteenth century in comparison with the large and prosperous Iranian cities of Esfahan, Mashhad and Tabriz, Tehran had a very small population, and was little more than a town. Bobek points out that by the late fifteenth century, Tehran had no more than 5,000 inhabitants.³ In 1627, Herbert's estimate of 3000 houses (15,000 - 30,000 persons) in comparison with the 70,000 houses (350,000-700,000) of Esfahan indicates the relative significance of Tehran; nevertheless this is the highest estimate of the population for Tehran up to the late 18th century.⁴

In 1796, when selected as the capital by the Qajar rulers, the population of Tehran was possibly more than that of Shiraz, but much less than that of Esfahan, Mashhad, and even Kermanshah. The choice of this place as capital resulted in the establishment of hundreds of Qajar households, and tradesmen and skilled craftsmen were obliged to operate from Tehran.⁵

In 1813 Kinneir estimated the population of Tehran as equivalent to that of Kermanshah, i.e. approximately 60,000.⁶ The 1820's and the 1830's witnessed further expansion of population due to immigration from the north western parts of the country as a result of Russian aggression

FIG. 3.2 POPULATION OF TEHRAN
FROM TRAVELLERS' ESTIMATES



SEE APPENDIX 1

SOURCE: BROWN, J.A. 1965.

in that area. The population of Tehran was estimated to be between 80,000 and 100,000 at this time. (See Appendix 1)

Such an increase, which ranked Tehran next to Esfahan, in turn created a number of problems, of which water shortage was the most immediate. It led to the build-up of areas outside the city wall. This fact can be seen from Kriziz's map of 1857 in which a considerable built up area is located in areas surrounding the city.⁷ From 1870 the population increase of the city was a major factor in structural expansion. The first government enumeration in 1867, put the city's population at about 160,000 including 17,000 in the immediate suburbs.⁸ By this time the city contained 9,000 houses and occupied an area of approximately 7.5 square kilometres. The density of population was about 40 persons per hectare and varied considerably from the west and north towards the east and south of the city, the most populated part of the city being found around the bazaar. Given periodic epidemics and famines, such as that in 1870, it is likely that the growth rate did not exceed 1 per cent per annum. This estimate is supported by the second official enumeration of 1891, but the population was calculated to be 250,000.⁹ Estimates vary greatly during this period and even official estimates are no more reliable than dependent estimates. (See appendix 1). The same source estimates that there were 18,000 houses and puts the city's area at about 20 square kilometres. Such a rapid

expansion reduced the overall density of population. Average household size also seems to have declined. By 1870 Tehran's population exceeded that of any other Iranian city except Tabriz, which was the seat of the Qajar crown princes, but by the turn of the century Tehran had grown larger than even that city. During the First World War, despite non-involvement, the population of the country increased only slightly. A relatively slow growth of population in this period can be seen from another enumeration taken in 1921 according to which the inhabitants of Tehran were reported to number 196,255, or only 1.7 per cent of the total population of the country.¹⁰

After 1925, however, a rapid increase of population occurred as a result of improvements to the city carried out by Reza Shah. Reconstruction of the city, the opening of factories and new ministries, created thousands of jobs which in turn led to the influx of a large number of migrants from the provinces. This flow was facilitated by the construction of a number of inter-urban highways, such as that from Mazandaran, development of bus services, and later the foundation of the Trans-Iranian railway.

Assuming a population growth rate of 1.5 per cent, as suggested by Amani, between 1926 and 1946, for the whole country, the population of Tehran would only have been 230,000 by 1940, when in fact it was over half a million.¹¹ Such a rapid growth indicated that 3.6 per cent of the total population of the country was concentrated

in that city, a sign of the rate of migration into Tehran. It was now more than the double the size of the next largest city, Tabriz. (Table 3.1)

TABLE 3.1:

Growth of population of the 10 largest cities
of Iran, 1940-66.

Cities	1940-1	1956	1966	% Growth 1956-66
Tehran	540,087	1,512,084	2,719,730	79.8
Esfahan	204,598	254,708	424,045	66.9
Mashhad	176,741	241,989	409,616	69.3
Tabriz	213,542	289,996	403,413	39.1
Abadan	N.A.	226,083	272,962	20.7
Shiraz	129,023	170,659	269,865	58.1
Ahvaz	N.A.	120,098	206,375	71.8
Kermanshah	88,622	125,439	187,930	49.8
Rasht	121,625	109,491	143,557	31.1
Hamedan	103,874	99,909	124,167	24.2

Source: The First National Census of Iran 1956 Vol. 1 Table 11 and Second National Census of Iran 1966 Vol. 168.

During the Second World War Tehran received further migrants as a result of food shortage, a series of continuous cold winters and agricultural difficulties in the provinces. This was followed by a period of political disturbance in the north-west provinces of Azarbaijan and Kurdistan. By the end of the 1940's however, more stable conditions

were to be found. Oil production increased, and this was reflected, for example, in the establishment of the Plan Organization of Iran, which was instrumental in the initiation of major improvements. The creation of new jobs and business opportunities allowed earlier migrants to bring in their relatives and at the same time encouraged more migrants to move to Tehran. Consequently the population of the city doubled between 1940 and 1950, reaching one million in the latter year. This trend has continued at a faster rate, partly as a result of medical improvements, the introduction of piped water, and the reduction in infant mortality rates.

This continuous increase led to such an expansion that in 1956 both the city's area and its population was more than three times that of 1940. Since then the population increase has gained momentum. This was encouraged especially by the continued development of administrative, commercial and industrial activities. Thus in 1966 the city of Tehran had 2.7 million people. If the population of Shemiran and Rey is added, the total population would have been 2.98 million, which was 11.9 per cent of the total population of the country, and 31.4 per cent of the total urban population.¹²

A. Growth and Movement of Population.

With the above information it is now possible to evaluate the general trends in growth and patterns of population movement. The dramatic increase of Tehran's population since the war has been outlined above, from half

a million in 1940, 1.5 million in 1956, and 2.7 million in 1966, an increase of 79 per cent during the 1956-1966 inter-censal period.

Accepting Jefferson's definition of a 'primate city', the primacy of Tehran during the 1960's becomes readily apparent.¹³ In 1966 Tehran had six times more people than the next largest city, Esfahan. This fact can also be seen from the rank size curve of Iranian cities. (Fig. 3.3)

Using the U.N. formula it was calculated that the growth rate per annum was 6 per cent, compared with a 2.5 per cent growth rate for the rest of the country.¹⁴ Three important reasons account for such a high growth rate:-

- a) Natural increase of the population.
- b) Urban and Rural im-migration.
- c) Expansion of the city limits.

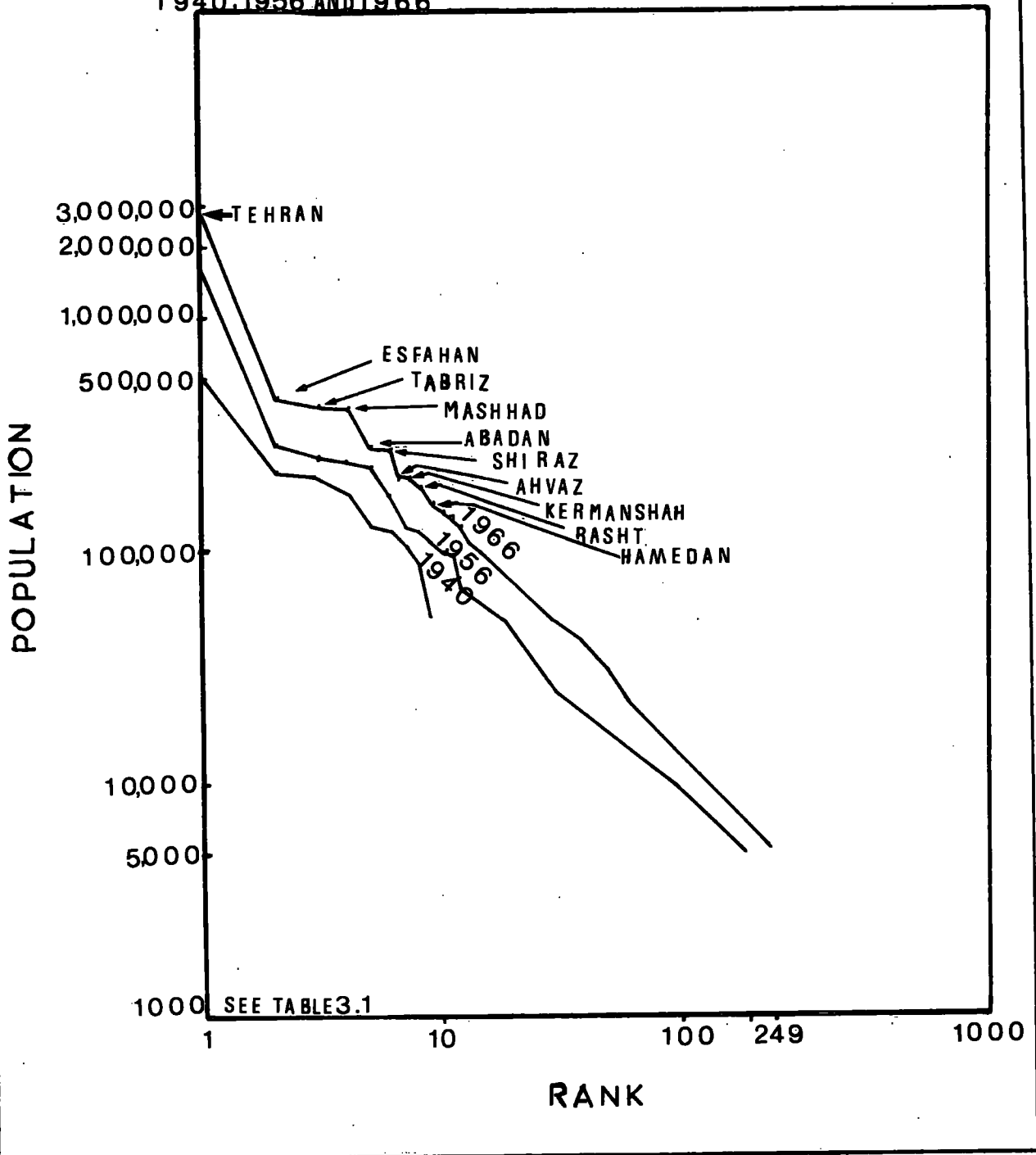
The first two categories will be analysed in this chapter whilst the physical expansion of the city is an integral part of later chapters which consider spatial growth of the metropolis.

I - Natural increase of the population.

a. Birth Rate

Natural increase is simply explained as the excess of births over deaths in a given period. Unfortunately none of the censuses give data on the birth rate. To estimate the natural increase rate, however, calculations are made by considering the number of children under five years of age at the time of enumeration. Furthermore information

**FIG. 3.3 RANK SIZE CURVE OF IRANIAN CITIES,
1940, 1956 AND 1966**



SOURCES: MINISTRY OF INTERIOR (1940 & 1956) ·
STATISTICAL CENTRE OF IRAN (1966) ·

recorded by the Department of Civil Registration and Statistics (D.C.R.S.) has also been analysed.¹⁵

In 1956 there were 47,445 registered live births recorded by D.C.R.S. compared with 43,185 children under one year of age, enumerated by the census. This sort of discrepancy is impossible to reconcile although it is probable that the census data is the more accurate. To obtain the birth rate of the population, the relevant formula was applied to the 1956 census.¹⁶ The result was 28.5 births per thousand population. When the same formula was used for the 1966 census, the birth rate had been raised to 30.6. This indicates a notable increase which may be attributed to a better enumeration in the 1966 census, as well as in improvement in the general health conditions of the population due to an expansion of medical services. However this increase has naturally been reflected in the youthfulness of the population, so much so that it has reduced the median age from 21.7 years to 19.3 in the inter-censal period.¹⁷

A comparison of birth rates in Tehran with the rest of the country shows that the capital had a lower birth rate both in 1956 and in 1966, which must be accounted for in terms of better standards of living and more emphasis on family planning in Tehran. (See Table 3.2).

TABLE 3.2

Birth rates in Tehran, urban Iran and Iran
1956 & 1966

Birth rate.	<u>Tehran</u>		<u>All Urban areas</u>	<u>Total country</u>
	<u>1956</u>	<u>1966</u>	<u>1966</u>	
	28.5	30.6	31.9	32.5

Source: First National Census of Iran, 1956, Tehran Vol. 2, Iran Vol. 2, and Second National Census Populations, 1966, Tehran Vol. 10, Iran Vol. 168.

b. Death Rate:

Due to an almost complete absence of data, estimates of the death rate are even less reliable than those for the birth rate. However, in the light of general demographic observations in developing countries, it seems likely that infant mortality accounts for the greatest number of deaths in Tehran.

TABLE 3.3:

Death rates and Life expectancy by Age and Sex 1960^x

<u>Age Groups</u>	<u>Male Deaths per 1,000 Births</u>	<u>Female Deaths Per 1000 Births</u>	<u>Life Expectancy for both sexes</u>
Less than One Year	166.1	134.2	50.0
1-4	14.3	13.6	52.0
5-9	1.7	1.6	63.2
10-14	1.2	0.9	68.8
15-19	1.4	1.2	68.2
20-24	2.3	1.6	67.2
25-34	2.6	2.6	63.2
35-44	10.4	6.9	60.4
45-54	18.2	10.2	60.4
55.-64	27.8	20.8	60.4

^x Source: Ministry of Health. 1960.

In 1960, the Ministry of Health, published a table relating to Tehran, in which the death rate of the population by sex and age groups was given, together with life expectancy rates (Table 3.3). In this the death rate of children under one year of age ranged from 134 per thousand for female infants to 166 per thousand for males. According

to this table, the death rate for the age group 15-19 tends to be the lowest. After that, as the age increases the death rate also increases.

In 1956, the total number of deaths registered by D.C.R.S. was 16,886, a number which differed from the 14,987 given by the Ministry of Health. This is one indication of the data problem. Using the relevant formula, the death rate of the population for 1956 was 11.1 per thousand. Based on a sample survey in 1959, Amani calculated a death rate of 7.3 thousand for the population of Tehran which shows almost a 4 per cent improvement.¹⁸ Due to a further increase in medical facilities (hospitals, emergency clinics, charities and orphanages) it is estimated that by 1966 the death rate had declined to 5 per thousand.¹⁹ Taking this figure, the natural increase in 1966 can be calculated as 30.6 minus 5 (the number of births minus the number of deaths), i.e. 25.6 per thousand. Such a rate of natural increase adds 65,000 to the population of Tehran annually. Since the actual annual addition to the population is more in the region of 120,000 per annum, the difference can in part be explained by immigration.

II - Migration

In both censuses, the term migration has simply been applied to people whose place of birth differed from the districts in which they were enumerated, which hardly gives an adequate account of movements after birth. Accepting this definition for want of any other data, migration to Tehran has had a remarkable effect on the population growth

of the city. This can be supported by data given by the two censuses. In 1956, out of 2.08 million migrants in the whole country, more than 755,000 or 36.3 per cent were attracted to Tehran (the latter number comprised 50 per cent of Tehran's 1956 population). The trend continued with the 1966 census, when out of 3.3 million migrants in Iran, about 1.3 million or 40.5 per cent were absorbed by Tehran (Table 3.4).

TABLE 3.4:

Migrants in Tehran and Iran, and increase
of migrants from 1956-66

	1956	1966	% increase of migrants
Iran	2,081,082	3,281,315	57.6
Tehran	755,721	1,329,213	75.8
Percentage of migrants in Tehran	36.3	40.5	-

Source: First National Census of Iran, 1956, Tehran Vol. 2, Iran Vol. 2, Second National Census Populations, 1966, Tehran Vol. 10, Iran Vol. 168.

A problem which arises here is that, those who have been counted as migrants in 1956 should not be considered again in 1966. This makes a comparative study almost impossible. According to the Iranian Statistical Centre, from 1956 to 1966, more than 630,000 people migrated to Tehran, which on average is more than 63,000 per annum, a figure which accounts for approximately half of the annual growth of Tehran. Table 3.5 shows migration trends

towards Tehran, and their importance in the population growth of the city.

TABLE 3.5:

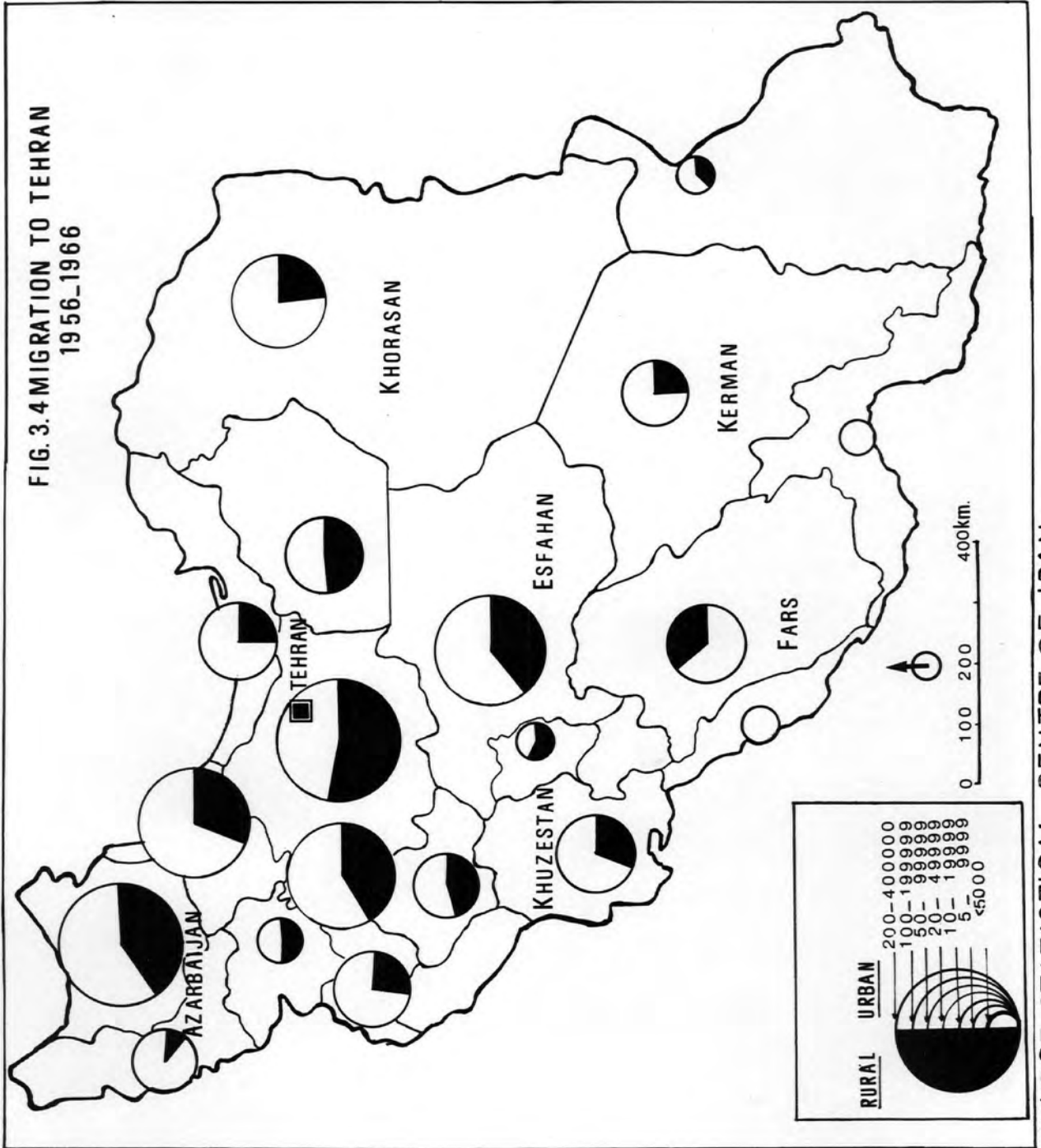
Migration to Tehran between 1956 and 1966

<u>Year</u>	<u>Number of Migrants</u>	<u>% of migrants</u>
1956	110,029	17.4
1957	31,384	4.9
1958	57,397	9.1
1959	64,699	10.2
1960	53,120	8.4
1961	59,408	9.4
1962	44,945	7.1
1963	64,324	10.1
1964	59,673	9.4
1965	41,606	6.6
1966	46,997	7.4
Total	633,582	100.0

Source: Iranian Statistical Centre. The Economic Survey of Greater Tehran, 1967.

A study of the origins of these migrants shows two broad categories; firstly, a high proportion from areas which are agricultural, and secondly a considerable number of people from neighbouring areas. Another pattern is also illustrated by Figure 3.4 in which long distance

FIG. 3.4 MIGRATION TO TEHRAN
1956-1966



SOURCE: STATISTICAL CENTRE OF IRAN.

migrants to Tehran are shown to have come from urban areas, whilst the shorter distance migrants are from rural areas. In comparison with 1956, the migration pattern has slightly changed. For instance, the proportion of migrants from contiguous areas increased from 4.6 per cent in 1956 to 13.3 per cent in 1966, whilst the ratio of migrants from non-contiguous areas declined from 43.9 per cent to 34.6 per cent, which could in part be explained by government attempts at decentralization.

TABLE 3.6:

Population of Tehran by Place of birth

1956 & 1966

<u>Year</u>	<u>1956</u>	<u>1966</u>
Total population	1,512,082	2,719,730
Place of birth		
% Born in Tehran	50.0	51.1
% Born in other Shahrestan of Central Ostan	4.6	13.3
% Born in other Ostans	43.9	34.6
% Born in a foreign country	1.5	1.0

Source: National Census of population 1956 & 1966, Tehran Vol. 12, P.31 1956 Vol.10, P.4 1966.

According to the 1966 census, the distribution of migrants in Tehran shows a close correlation with their economic status. As a result the poorest district of the city (District 7) in the south contains the highest

TABLE 3.7 : Population by place of birth for districts of Tehran, Tehran, Shemiran, Rey (1966)

Place of birth	District District District District District District District District District District										Tehran City	Shemiran Rey
	1	2	3	4	5	6	7	8	9	10		
Total population	303,697	159,552	381,580	366,039	320,860	250,655	312,818	237,778	116,191	257,960	271,9730	157486
% Born in Tehran	47.5	50.0	50.6	50.1	54.4	54.5	45.1	51.3	47.3	62.9	51.1	23.4
% Born in other Shahrestans of Central Ostan	11.6	7.6	13.0	16.6	12.0	16.6	14.3	14.0	19.5	12.4	13.3	43.4
% Born in other Ostans	39.8	36.9	35.8	32.8	33.0	28.7	40.9	34.2	39.8	24.4	34.5	30.2
% Born in a foreign Country	1.0	5.5	0.6	0.6	0.6	0.2	0.5	0.5	3.5	0.3	1.0	3.0

Source: National Census of population and housing Tehran Shahrestan Vol. 10, P.4 Nov. 1966
 Shemiran " " 43
 Rey " " 33

proportion of migrants, whilst higher income migrants tend to settle in the north. In addition a relatively high ratio of non-contiguous migrants, including those from foreign countries, can be seen in the northern districts of the city. (Here the only exception is in Shemiran since the contiguous migrants compose a very high proportion of the population, which is mainly a direct result of recent northward migration of Tehranis to this area). (Table 3.7)

The available statistics on migrants indicate that the following factors are the main cause of migration into Tehran: (1) seeking employment, (2) seeking better employment, (3) marriage, (4) transfer, (5) education, and (6) military service and miscellaneous factors, such as recreation and psychology.

Dependent migrants accounted for 62 per cent of total migrants, or 398,000 persons. This ratio indicates the high proportion of family migration and its effect on population composition as well as its influence on other socio-economic aspects of the city such as housing, education, and employment. Excluding the dependent migrants, Table 3.8 shows other types of migrants, and the main reasons for their migration to Tehran.

TABLE 3.8:
Migration to Tehran City, by cause of migration,
1956 to 1966

<u>Cause of Migration</u>	<u>Numbers</u>	<u>Percentage</u>
Seeking Job	129,936	55.2
Seeking better job	40,265	17.1
Marriage	25,868	11.0
Transfer	18,822	8.0
Education	12,329	5.2
Military	3,042	1.3
Others	5,121	2.2

Source: The Economic Survey of Greater Tehran 1967.

The first two categories of migrants, which account for 72 per cent of the total, reflect employment opportunities in Tehran. Here higher wages in particular are a strong incentive. This is supported by the fact that in Tehran, the average wage of labourers in factories is 230 per cent more than that of similar labourers in the rest of the country.²⁰

Marriage is the third factor of importance influencing migration to Tehran and this is due chiefly to arranged marriages, which usually mean that those migrants who have already settled in Tehran go back home to marry, and then bring back their wives with them to the city.

Transfer is another category of migration, mainly covering government employees. In this case many of the migrants are middle-aged and have grown-up families, and they tend to move to Tehran for the rest of their lives. Many of these people invest in economic enterprises within the city and thereby further contribute to its expansion.²¹

The universities and colleges of further education attract people from the provinces to Tehran. Between 1956 and 1966, 5.2 per cent of the migrants came to Tehran for purposes of higher education. Most of this group consisted of men. Due to the attraction of the capital and employment opportunities after graduation, many prefer to stay in Tehran and do not return to their home towns.

National service is another cause for migration to

the capital. In recent years, however, the decentralization of army bases, has decreased the number of these migrants. During the period of their National Service, they acquire a measure of literacy and skill, and the attraction of the city will inevitably mean that a number of them become permanent residents.

Distribution and Density of Population

The pattern of population distribution in different districts, and the density in relationship to the changes, and the trends in movement of the population will undoubtedly throw some light on the nature of horizontal expansion of the city. Tehran, as mentioned, accommodates a population of 2.7 million, excluding the population of Shemiran and Rey (which has been reported to number some 260,311).

The population distribution is influenced by physical, socio-economic and cultural factors. The zones of the highest concentration and density correspond with the low income areas of the city (Fig. 3.5). This can be seen in an extended area from the bazaar southward to the railway station and including the two densely populated areas of Jawadiyeh and Naziabad, between the railway station and Qaleh Morqii military airport and to the eastern part of Maidan-e-Shoosh. Here density exceeds 600 persons per hectare. Other densely populated areas within Tehran are those in the eastern part

POPULATION DISTRIBUTION OF TEHRAN BASED ON NATIONAL CENSUS, NOVEMBER 1966.

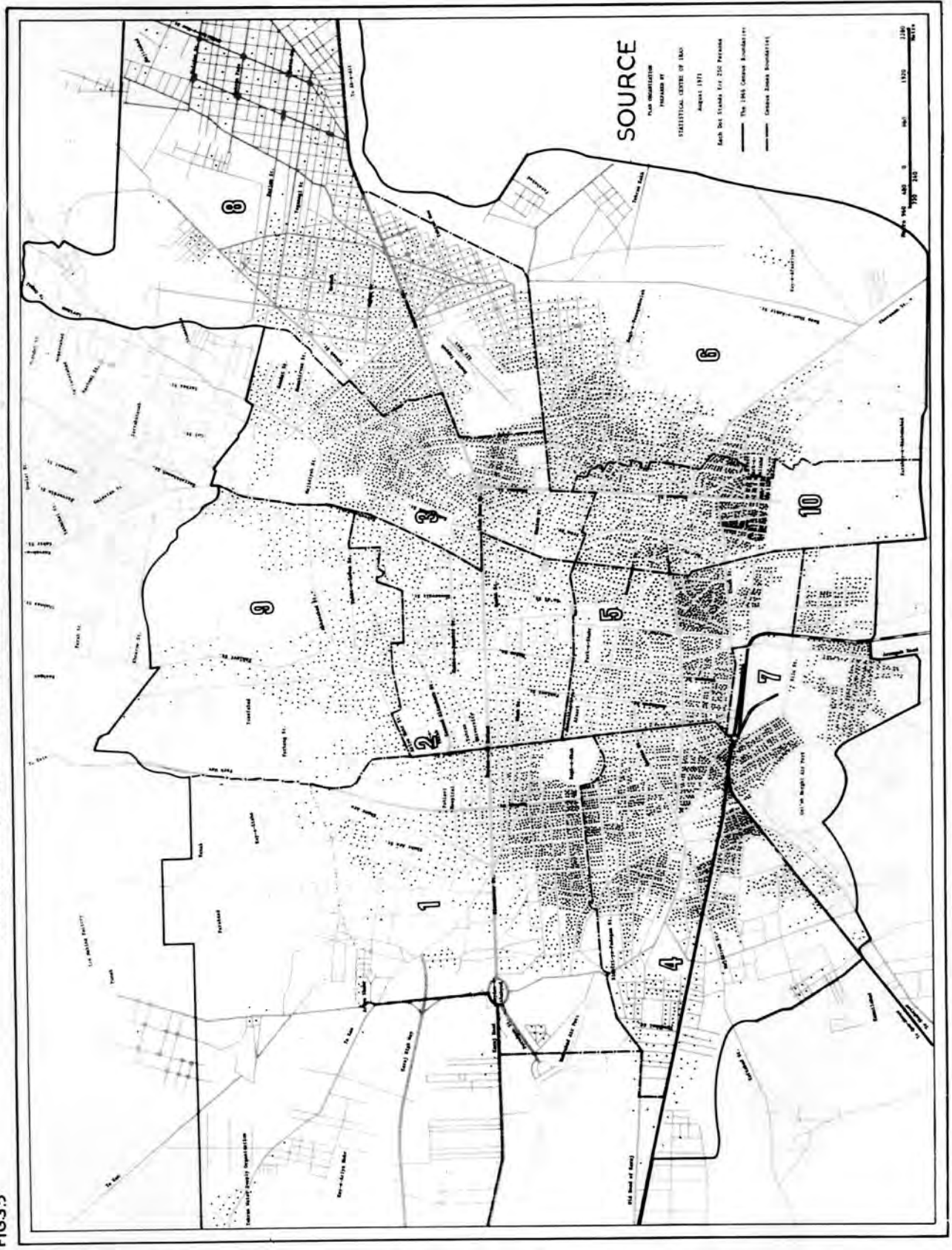


FIG.3.5

of Khiaban-e-Shahbaz in Soleymaniyeh, to the extreme east of the city. Between the old Shemiran road and Khiaban-e-Nezamabad, Heshmatiyeh, and Vahidiyeh are the two north-eastern suburbs, which have a high density and low income population, of which the majority are migrants. Another congested area is in the western part of the Baq-e-Shah, to the west of the city. This is a mixed area consisting of low class and lower middle class people who are mainly Azarbaijani migrants, but include some Armenians.

In contrast, in the northern part of the city, especially from Abassabad northwards densities suddenly drop down as low as 50 persons per hectare. This reflects the larger plots for housing units and also their scattered nature, due to unbuilt areas in between.

A specific feature of the city centre which includes the city park and the administrative area, is the marked decline in the residential population, although it has a very high day time population.

Variation and movement of population between 1956 and 1966

In 1956, for enumeration purposes Tehran was divided in to 50 districts whilst in the census report, data are shown for the whole city, not for individual districts. In 1966, because of both the larger size of the city and better enumeration facilities, Tehran was divided into 923 districts which were aggregated into ten major districts. Because of this difference a detailed study of the variation of the population is somewhat difficult. However, in general terms, there are five different areas which can be fitted

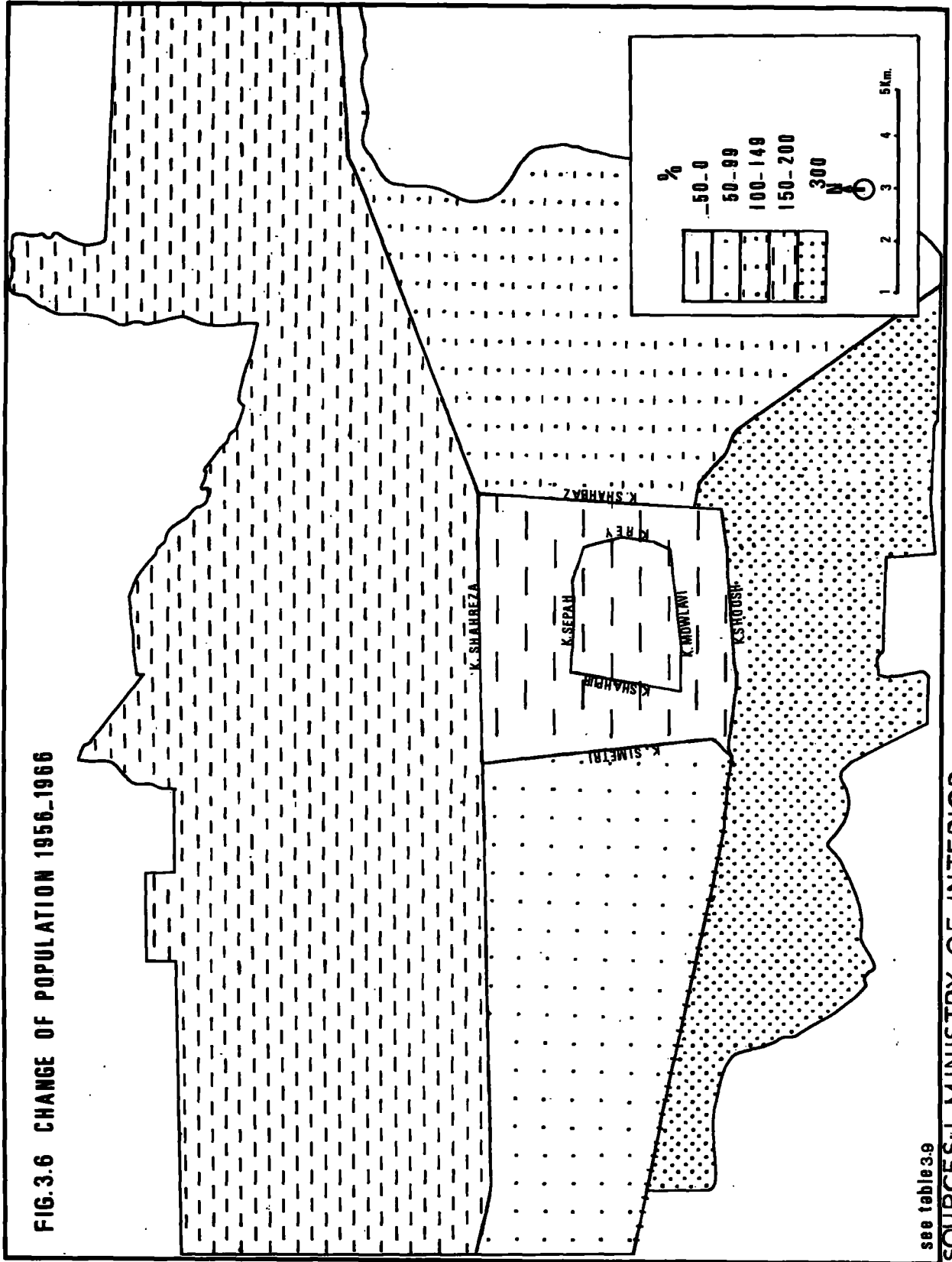
with equivalent boundaries for both 1956 and 1966. These areas have been devised as follows:²²

- (1) Central Area - bounded by the four main khiabans of Tehran, (Shahreza, Shahbaz, Shoosh, and Simetry) - containing the sub-division of the old city.
- (2) Northern part - north of Khiaban-e-Shahreza
- (3) Eastern part - east of Khiaban-e-Shahbaz
- (4) Southern part - south of Khiaban-e-Shoosh
- (5) Western part - west of Khiaban-e-Simetry

The old city of Tehran, bounded by Khiaban-e-Sepah (north), Rey (east), Shahpur (west), and Mowlavi (south), is also an area which has fairly good correspondence with 1956 data, hence it is studied as a sub-division of the central area of Tehran (see Fig. 3.6).

A similar study has been made by Amani based on the 1956 census and a sample survey in 1960, and, in order to bridge the inter-censal gap this latter study has been incorporated.²³ It was found that whilst the population of the whole of the city has increased by 79 per cent, during the 1956-66 period, the Central Area of Tehran has lost 14.9 per cent of its population (Table 3.9). This indicates an outward movement of population from this area, which encloses nearly the whole of the C.B.D. of Tehran; for land values are getting higher, because of the demand by commercial enterprises, and this, together with increased congestion is making it less desirable for residential purposes. Yet the Old City, a sub-division of the Central Area, shows a further decline in its population of about 23.8 per cent (from 149,821 to 115,173 in 1966) (Table 3.9).

FIG. 3.6 CHANGE OF POPULATION 1956-1966



see table 39

SOURCES: 1-MINISTRY OF INTERIOR;
2-STATISTICAL CENTRE OF IRAN

It is likely that this trend will be continued and a further decline in the residential population is to be anticipated. Between 1956 and 1960, population increase in northern Tehran was only 56.4 per cent but between 1956 and 1966 this increase was 172 per cent, an indication of northward movement, especially after 1960.

TABLE 3.9:

Population change in areas of Tehran
(1956 to 1966)

AREA	POPULATION ¹ in 1956	POPULATION ² in 1966	% CHANGE in 1956-66
CENTRAL	601,415	515,073	-14.9
CORE AREA (Old City)	149,821	115,173	-23.8
NORTHERN	244,697	667,009	+181.2
EASTERN	171,969	362,653	+116.4
WESTERN	374,660	574,694	+ 57.8
SOUTHERN	127,460	483,452	+301.8

- Source: 1. Enumeration District map, 1956 Ministry of Interior First National Census.
2. Enumeration District map, Tehran 1966 Plan Org. Iranian Statistical Centre.

The population movement in the eastern part of the city during the four years of 1956-60 is not so significant but the increase of 116 per cent between 1956 and 1966 is very great, and is a direct result of the construction of low and middle class buildings in this part of the city.

The quantitative change of population in the western part of Tehran as a whole seems to be less important than

that in other parts. During the period 1956-60 this part increased by about 6.8 per cent and from 1960 to 1966 by 43.6 per cent. Such a relatively low growth rate can be attributed to a variety of factors such as the presence of industrial areas, together with the presence of some large open spaces including Mehrabad airport to the west and the barracks of Bagh-e-Shah to the east. Furthermore this area was already one of the most populated areas of Tehran.

Turning to the southern part, this area has had a relatively slow growth of 77.5 per cent during the 1956-60 period, but from 1960 onwards it showed a rapid increase of 301.8 per cent over the 1956 population. Such an increase which has been created mainly by new migrants, resulted in this part of the city becoming the most densely populated area of Tehran.

B. Population Structure of Tehran.

In this section an attempt will be made to examine other important aspects of the population structure of Tehran; such as age and sex composition, marital status, fertility, and mortality.

1. Age structure:

Age structure is considered as a fundamental basis for any population study of urban areas. In fact, information dealing with age groups is of major importance for any form of socio-economic planning, such as education and employment.

According to the U.N. Classification, a close relationship seems to exist between the age composition of populations and the economic development of a country.²⁴ The age - sex composition of the population of Iran is very similar to those of other developing countries. In fact in the intercensal period the population of Iran tended to become more youthful. Reasons for this are an increase in medical welfare and living standards which have caused the median age to be reduced from 20.2 to 19.9.²⁵ Such a youthful population is due mainly to an increase in the number of children and will undoubtedly provide the society with a number of problems associated with educational expansion and the provision of adequate social welfare services.²⁶

The age structure of Tehran's population shows a similar composition to that of the whole country. However, contrasts were found when comparisons were made for the different districts of the city. Here, age structure of the city population has been examined with reference to three major age groups (0-14, 15-64, and 65 and over). These groups are on a par with the U.N. classification and thus facilitate international comparisons. Another factor which has been taken into account in this classification has been the recent Child Labour Law passed by the Majlis, limiting the minimum employment to 15 years. These three groups will be termed children, adults (economically active), and aged.

a) Children

Children under fifteen years of age form a relatively high proportion of the population of Iran. A comparison between Tehran and the total country indicates that the proportion is smaller in the capital. This is partially explained by a better standard of living in Tehran, recent family planning programmes, and the large number of migrants of working age.

In 1956 children composed 37 per cent of the total population. This increased to 41 per cent by 1966. Such an increase is partly attributable to immigration and to a decline in infant mortality as a result of medical improvements. It does however have a considerable effect on the dependency ratio (Appendix 2).

b) Adults (Economically active)

As a primate city and a centre of attraction, Tehran would be expected to have a higher proportion of adults than other Iranian cities. This is evident when comparisons are made. However, it is inevitable that because of an increase in the percentage in the group under 15, the proportion of adults in the total population has declined during the 1956-66 period, from 60.1 per cent in 1956 to 56.1 per cent in 1966. A breakdown into two sub-groups produces significant differences. In 1966 the younger adults (15-44) composed more than 45 per cent of the total population of Tehran, and the highest proportion in comparison with other Iranian cities. The older adults (45-64), on the other hand represented a fairly low

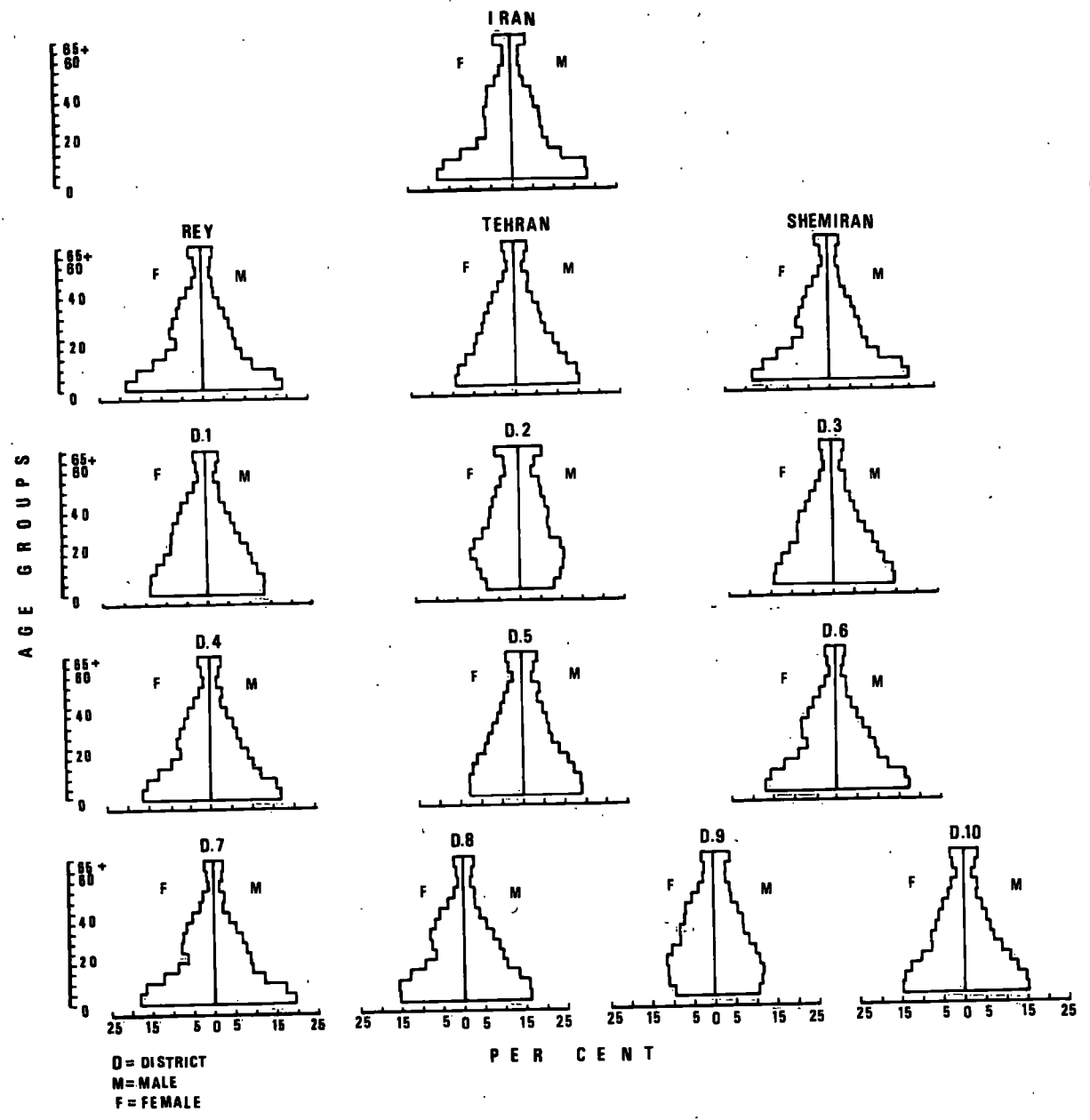
proportion of 10.7 per cent. This is perhaps partially related to a shorter duration of life, in general and retirement of non-Tehranis to their native homes.²⁷

c) Aged (65 years and over)

In comparison with other developing countries, the population of Iran has a very low proportion of aged people. Yet Tehran had a smaller proportion than the country as a whole. In 1966 only 3 per cent of the total population of Tehran were over 65 years of age. This proportion was equal to that of 1956 but less than the average for the country, which was 3.6 per cent (Appendix 2). In 1966 there were only 81,295 people over 65 years of age in Tehran, although this will increase with an improvement of living standards.

When the different age groups were examined in various districts of the city a clear pattern emerges, and it is apparent that there are close correlations between age groups and economic conditions. For example, the more poverty-stricken southern districts, especially District 7, have a high proportion of children, and the northern districts of the city have a high proportion of active and aged population (Appendix 2). A general trend of aging from south to north can be seen, consistent with different levels of economic and social status within the city. This pattern is illustrated in greater detail in the population pyramids (Fig. 3.7).

**FIG.3.7 AGE-SEX STRUCTURE OF
IRAN, TEHRAN AND ITS DIFFERENT DISTRICTS 1966
(AGES ARE IN FIVE-YEAR GROUPS)**



SOURCE: STATISTICAL CENTRE OF IRAN.

2. Total Dependency Ratio.

Reference to the Total Dependency Ratio also throws light on Tehran's population structure. The Total Dependency Ratio (T.D.R.) is defined as the ratio of the number of persons under 15 and over 65 years of age, to the number of persons in the age group 15-64, multiplied by 100 i.e. $\left(\frac{\text{Children} + \text{Aged}}{\text{Adults}} \right) \times 100$.

Kamerschen points out that a country might be judged 'over populated' if this dependency ratio exceeds 100.²⁸ For Iran, the ratio in 1956 was 83.6 and in 1966 was 99.8. In the rural areas, because of more children, a higher T.D.R. is common, whereas in urban areas a lower ratio is to be seen.

In 1956, the T.D.R. for Tehran was 66.5 whilst the corresponding ratio in 1966 was 78.6 (Appendix 2). Since 1966 the proportion of Aged compared with 1956 has not changed, hence the increase of T.D.R. should be attributed mainly to recent increases in numbers of children within Tehran.

Analysis of the distribution of the T.D.R. for the different districts of the city and two suburban areas, shows significant differences. The distribution indicating a close relationship between T.D.R. and the location of districts. Figure 3.8 shows both the child and aged dependency ratios and indicates a positive correlation for child dependency ratio but a negative relation for the aged. This shows, that, in Tehran, the curve of child dependency increases in a north-south gradient whereas

in contrast, the aged dependency ratio increases from south to north.

The two extreme districts of 2 and 7, show a high variance in T.D.R., that is, from 50.6 in district 2, to 100.7 in district 7. Such a high difference means that, in district 2, there are fifty dependents for 100 adults, whereas in district 7, 100 adults are expected to support 100.7 dependents.

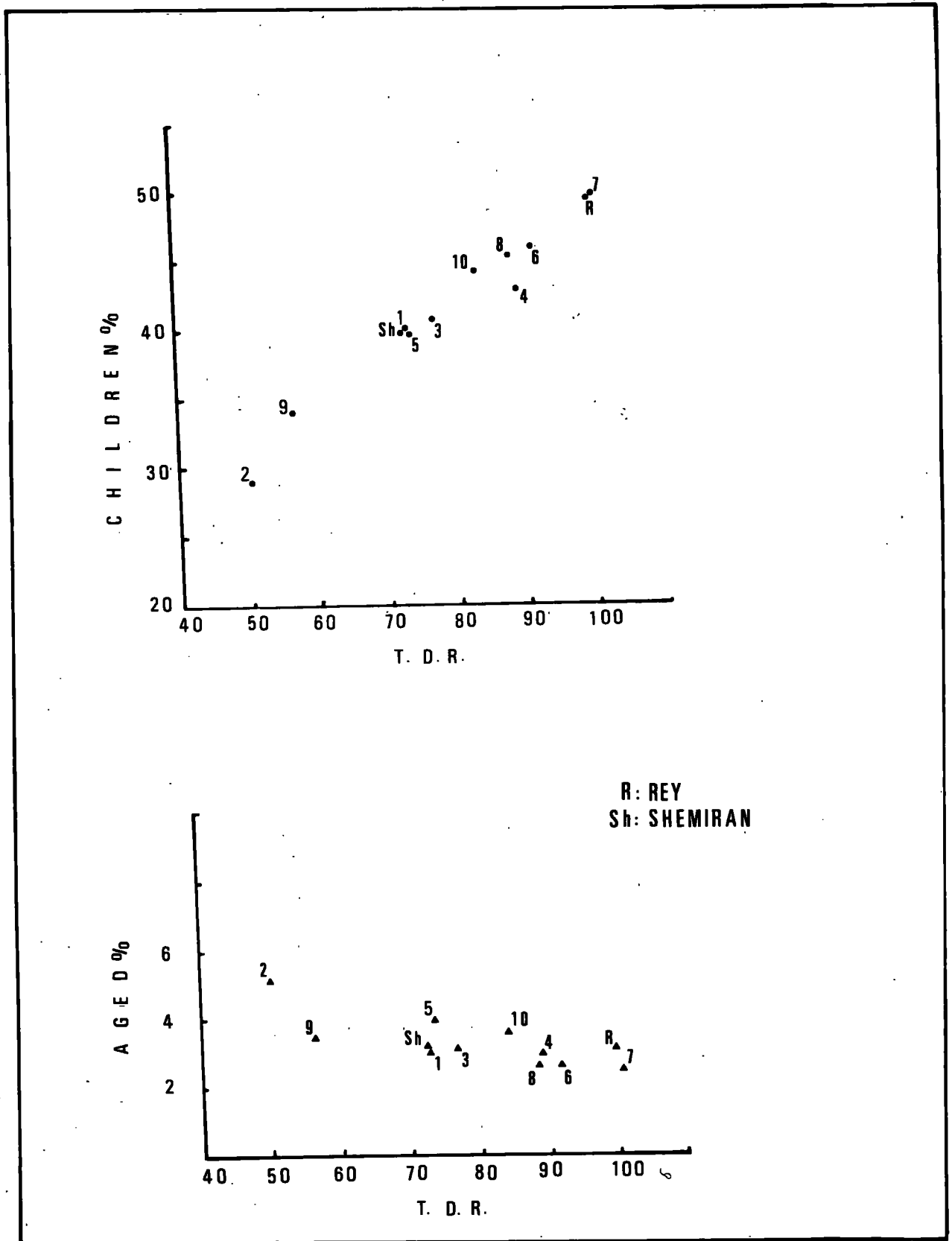
District 2 and 9 show a much lower T.D.R. than the city's mean ratio, districts 1, 3, 5, and Shemiran show a very close correlation to the city's mean ratio and the other districts (4, 6, 7, 8, 10, and Rey) with the exception of district 8, which are located in the south of Khiaban-e-Sepah, indicate a much higher T.D.R. than the city's mean ratio. Applying Kamerschen's concept, district 7 could be accounted as an over populated area. (See Fig. 3.8).

The above factors are undoubtedly obvious indications of the existing socio-economic conditions in the different districts of the city. Where there is more poverty there is a higher child dependency ratio, and where there is more wealth there is a higher aged dependency ratio.

3. Sex Structure.

Sex structure is examined in terms of the 'sex ratio', that is the number of males per 100 females. In 1966 Iran had 107.3 males per 100 females. A comparison between Iran

FIG.3.8 RELATION BETWEEN CHILDREN/AGED POPULATION AND TOTAL DEPENDENCY RATIO FOR DIFFERENT DISTRICTS OF TEHRAN.1966



SOURCE: STATISTICAL CENTRE OF IRAN.

and selected countries show that Iran is similar to India, but significantly different from so-called 'developed' countries. The exact reason for such a high number of males in proportion to females is not fully understood, but the higher number of maternal deaths, the possibility of an under-reporting of females or emphasis on male children especially in rural areas, might contribute to this sex ratio. In contrast to Iran as a whole Tehran had a higher ratio of 110.3 males per 100 females. Table 3.10 indicates that between 1956 and 1966, the sex ratio for Tehran declined from 112.0 to 110.3, while the corresponding ratio for the national average increased from 103.6 to 107.3. The reason might be given in terms of the increase of female migration to Tehran as a result of recent cultural change in the country and an increase in family migration.

TABLE 3.10:

Sex ratios of Tehran, Urban Iran and Iran
(1956 & 1966)

<u>Year</u>	<u>Sex Ratio</u>		
	<u>Tehran</u>	<u>Urban Areas</u>	<u>Iran</u>
1956	112	106.4	103.6
1966	110.3	108.4	107.3

Source: First and Second National Census of Iran 1956 & 1966.

In relation to age groups, the sex ratio shows the following characteristics; (a) a reasonable normality of sex ratio of about 104.8 for the under 15 group, (b) a

considerable excess of males over females for the 15-64 group, which can be accounted for in terms of a greater tendency for male migration. The highest sex ratio is in the age group 40-49, about 137 males per 100 females. (c) For the aged group the situation was reversed, as there were 95.1 males per 100 females. Indirectly this may indicate that females live longer than males. Also, it could reflect the tendency to state age in 'groupings' - a feature common to less developed countries, when birth records are often non-existent, or poorly developed.

When a comparison was made between Tehran and the major Iranian cities, it appeared that the sex ratio of Tehran's population is not so high, since it was exceeded by many Iranian cities, such as Rezaiyeh, Kermanshah, Shiraz, Gorgan. In addition, it was found that, with the exception of Rezaiyeh, Tehran was the only city which had a decrease in sex ratio during the 1956-66 period (Table 11). This is apparently due to recent improvements in female status which encouraged them to migrate, but it could also be associated with improvements in techniques of communication over this period.

TABLE 3.11: Sex ratios of Tehran and Provincial capital cities 1956 + 66

<u>Cities</u>	Sex Ratio	
	1956	1966
Tehran	112.2	110.3
Mashhad	102.9	106.7
Rasht	99.2	102.8
Rezaiyeh	116.5	113.4
Kermanshah	113.1	114.1
Gorgan	125.3	121.7
Abadan	104.8	105.4
Esfahan	104.9	107.3
Shiraz	109.1	112.5
Tabriz	103.8	107.1
Kerman	101.5	104.5

Source: Iranian Census of population 1956 Vol. 1 + Vol. 168, 1966

Distribution of age-sex composition, shows significant differences when examined in different districts of the city. For instance, female surpluses were characteristic of the northern residential areas. In contrast male surpluses occurred in the city centre. For example, district 2, especially its northern part located to the north of Khiaban-e-Shahreza, represents a fairly low sex ratio of 104.6, while district 5, including the Bazaar and most of the administrative departments has the highest sex ratio of 111.6. (See Appendix 2)

4. Marital Status of the Population of Tehran.

A study of the marital status of Tehran's population brings out some features relatively common to the whole of the Iranian population. That is a high proportion of young married women and a lower age of marriage for women. Although the earliest age of marriage is 16 years for girls and 18 years for boys, according to common law. In 1966 there were 2,639 married women and 25 married men aged between 10 and 14.²⁹ Annually there are many unlawful marriages in Tehran which are referred to the courts. Such early marriages might be one of the results of a higher birth rate in Tehran.

The marriage of women was examined for different age groups. As the age increased up to 30, the number of females available for marriage declined rapidly. For instance in the age group 20-24, there were more than four unmarried males for every single female, but in the group 25-29, there were nearly six single males still available

for marriage, for every single female. The early marriage of females can also be shown by calculation of the married males per married females. As a result, in the age group 15-19, the chance of marriage for females was 26.1 times more than for males, in the age group 20-24 it was 3.6 times, and for the age group 25-35 it was 0.6. Such a rapid decline, especially after the age of 30, is mostly due to those working migrants who have left their families at home, and yet are married, thus reducing the marriageable males available for females in this sector of the population. In 1966, the highest ratio of married males (94%) was in the age group 45-54, while the corresponding ratio (90.7%) for females was in the age group 25-34.

When the proportion of females in the age group 15-45 (the child-bearing age) was studied, it was found that more than 25 per cent of the Tehrani females in this age group were unmarried. Such a ratio compared with the average for the total country (19.2%), is fairly high. Because of the now greater freedom existing for women, marriages tend to be postponed, with subsequent effects on the fertility rate. It would appear that women are marrying later and thereby reducing their child-bearing capacities.

There is a big difference between the age at marriage of males and of females, a significant feature of the marriage statistics of Tehran and indeed Iran. In 1966 the highest number of marriages of males was to be found within the age group 30-34, while for females it was for the age group of 15-19. This phenomenon is also

TABLE 3.12: Marital status of Tehran Population over 10 years by sex for Different Districts 1966

Different status	1		2		3		4		5		6		7		8		9		10		Tehran City	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Married	50.8	53.5	47.6	47.8	52.5	55.7	54.0	59.7	50.3	54.9	55.9	60.5	57.4	63.8	54.6	57.5	51.1	50.3	52.9	57.2	51.7	56.6
Widowed	0.8	11.1	1.6	14.0	1.0	10.9	1.0	10.2	1.5	12.9	0.9	9.7	0.9	9.6	0.7	9.6	0.8	11.8	1.0	11.8	1.0	11.0
Divorced	0.7	2.2	1.0	3.3	0.7	1.9	0.7	0.2	1.1	2.1	0.5	1.4	0.5	1.1	0.4	1.4	0.7	2.8	0.7	1.7	0.7	2.0
Never Married	47.2	20.5	49.4	34.0	45.0	29.8	43.8	27.0	46.7	29.5	42.7	27.7	41.0	24.9	43.8	30.4	47.0	34.2	45.1	28.4	46.1	29.4
Not Reported	0.5	1.2	0.4	0.9	0.8	1.8	0.5	1.0	0.4	0.6	0.3	0.7	0.3	0.6	0.5	1.1	0.4	0.9	0.3	0.9	0.5	1.0

Source: Second National Census of Iran 1966 Tehran Vol. 10 pp. 34-44 1966.

reflected in the high proportion of widows; of the female population over 10 years of age 11 per cent were widowed as compared with only one per cent of the total male population (see table 3.12). If the statistics are examined for each district it will be clear that the higher income areas have higher proportions of widowed females (14 per cent for district 2), while lower income areas have a relatively lower proportion (9.6 per cent for district 7). This could be attributed to higher life expectancy for females in the higher income areas. A higher divorce rate is also characteristic of these areas, a result of greater freedom and contact with different forms of social life. In the southern areas the divorce rate is lower because women are more restricted in their activities. In the city as a whole the rate of divorce for women is approximately three times that for males. This may be partially explained by the breakdown of polygamous marriages. The youthfulness of the population, the higher age of marriage for males, greater freedom, and an increased desire to postpone marriages until economically feasible are among the most important reasons for 46.1 per cent of the male population over 10 years of age being unmarried. The lower age for marriage among females, together with social restrictions, combined to reduce the proportion of unmarried females to 29 per cent of the total female population (see table 3.12).

5. Literacy of the population of Tehran.

A study of the level of literacy in Iran highlights two general features a) the great difference in the

literacy rates between rural and urban areas, and
b) a large proportion of illiterate women compared with men. Several reasons can be put forward to explain this, but the most important would appear to be the emphasis on male dominance in the social system.

Although a law of compulsory education was introduced throughout the whole country in 1943, Iran was still classified as having a low level of literacy (10-15%) along with Iraq and Nigeria.³⁰ This is reflected in the 1956 census with only 14.9 per cent of the total population over ten years of age being literate. This figure conceals considerable variations; 6 per cent of the rural population was literate, compared with 37 per cent of the urban population; and 22 per cent of males were literate as compared with only 7 per cent of females.³¹

Since the early 1960's, the Iranian government has attempted a nation-wide drive against illiteracy. As a result during the 1956-66 period literacy increased from 14.9 per cent to 28.1 per cent.³²

For a long period Tehran was in a much more favoured position. In 1956 the literacy rates for Tehran were three times those of the national average. From 1956-66 the literacy rate increased from 45.9 per cent to 62.7 per cent. For males it increased from 54.8 per cent to 70.9 per cent, and for females, from 35.4 per cent to 53.5 per cent. The marked improvement for women is to be explained in terms of their greater freedom in recent years. In 1966, more than 88 per cent of males and 82 per cent of

females between 10 and 19 were literate. The corresponding rate in 1956 was 71 and 61 per cent. Such improvement of literacy confirms the recent achievements of adult anti-literacy campaigns.

TABLE 3.13:

Literate population of Tehran aged 10 years and over
by sex and age group. 1956 + 1966

Age Groups	Both Sexes		Male		Difference	Female		Difference
	1956	1966	1956	1966		1956	1966	
10-14	75.7	91.1	78.8	92.7	13.9	72.3	89.4	17.1
15-19	57.7	80.1	63.8	85.7	21.9	50.9	74.1	23.2
20-24	48.8	67.1	53.7	76.0	22.3	34.1	57.2	23.1
25-34	43.4	55.1	52.2	65.9	13.7	32.2	42.1	9.9
35-44	38.6	50.6	49.1	61.1	12.0	24.5	36.9	12.4
45-54	22.0	41.9	43.9	56.6	12.7	13.9	25.6	11.7
55-64	27.8	33.0	40.9	50.7	9.8	14.2	15.9	1.7
65+	22.7	26.4	34.0	42.1	8.1	12.4	10.5	- 1.9
Total Ave.	45.9	62.7	54.8	70.9	16.1	35.4	53.5	18.1

Source: First and Second National Census of Iran, Tehran 1956, Vol. 2, Table 5. 1966, Vol. 10 Table 6.

Table 3.13 shows the proportion of literate population for different age groups. Examining the various districts of the city in detail, different literacy rates are highlighted (See Table 3.14). District 7, for example, located in the south has a literacy rate which is 18.3 per cent lower than the city average, while District 2, in the north has a rate which is 15.7 per cent above the average. Thus once more we have further evidence of the great contrasts between the northern and the southern parts of the city. In the

south a high proportion of school-age children are found to be working rather than at school, which naturally has a negative effect on literacy rates. In 1966, 62.7 per cent of the population over 10 years of age were literate. This rate varied considerably, from 45.8 per cent for District 7, to 79.8 per cent for District 2. Differences between male and female literacy rates in the north are smaller than those in the south. The proportion of illiterate females in the south is much higher than in the north (See table 3.14).

TABLE 3.14:

Distribution of the Literate Population of Tehran
10 years and over, by sex for different districts 1966*

Districts	Both sexes	Male	Female	Difference between Male & Female	(Per Cent)
					Difference from Average % of both sexes.
1	71.9	80.6	62.7	17.9	+ 7.8
2	79.8	85.1	74.3	10.8	+ 15.7
3	64.8	72.9	55.7	17.2	+ 0.7
4	57.4	67.4	46.4	21.0	- 6.7
5	58.5	66.4	49.7	16.7	- 5.6
6	56.8	65.4	47.6	17.8	- 7.3
7	45.8	56.3	34.2	22.1	- 18.3
8	67.6	76.2	58.6	17.6	+ 3.5
9	77.7	81.0	74.2	6.8	+ 13.6
10	60.7	69.6	50.9	18.7	- 3.4
<hr/>					
Average	64.1	72.1	55.4	16.6	-
<hr/>					

* Second National Census of Iran, Tehran Vol. 10, 1966.

C Employment and Occupational Characteristics

Industry in the economic development and urbanization of a developing country such as Iran can obviously be very important. Here an attempt will be made to study the effect of industry on employment structure of Tehran's population. This will be studied for the three major industrial sectors; (primary, secondary, and tertiary), and Tehran will be compared with other major Iranian cities.

The recent interest of the Iranian government has been chiefly reflected in the national Iranian development plans, particularly in the Fourth National Development Plan (1968-72). The major aims of this plan can be outlined as follows;

- a) Greater opportunity of employment in the industrial sector.
- b) A further expansion of mechanized agricultural and manufacturing products, in order to meet the demands of an ever-increasing population.
- c) Greater industrial output in order to reduce the economic dependence of the country, thus saving foreign exchange reserves and allowing greater domestic investment.

This industrial development can be cited as one of the most important reasons for the expansion of metropolitan Tehran in both population and in area. This concentration has resulted in over-centralization of industry in Tehran and the surrounding areas, a condition which continues to be reinforced by the following factors:-

- a) The increasing population, which has produced a great demand for manufactured products especially food and clothing.
- b) Accessibility of Tehran to the national market as well as its wide range of communication facilities.

- c) Greater security of investment in Tehran for the private sector especially for foreign investors.

To analyse the industrial structure of Tehran, the 1963 industrial census was a relatively detailed study in which Tehran was divided into five industrial zones plus Shemiran. The 1956 and 1966 censuses also contribute useful data especially for comparative purposes. Furthermore an industrial survey on manufacturing establishments of Tehran was carried out by the Institute of Social Studies (1964). In addition, a survey of industrial establishments for 212 Iranian cities conducted by the Ministry of Labour and Social Affairs (1965) has been modified for the purposes of this study.

As table 3.15 indicates, the employment structure by sector shows that the majority of workers are employed in the tertiary sector, which clearly illustrates the character of Tehran as a service centre. Of the total employed population of 755,000 in 1966, those employed in the primary sector accounted for only 1.5 per cent compared with 63.6 per cent for the tertiary sector, and 35.3 per cent for the secondary sector.

Breakdown of the employed population within the tertiary sector shows that the service industries have the largest share, accounting for 32.2 per cent of the total employed population, followed by manufacturing, commerce, construction transport and communications ... respectively. A large number of people employed in the

TABLE 3.15:

	<u>Employed population of Tehran by Major Occupation</u>					
	<u>1966</u>					
	Total		Male		Female	
	Number	%	Number	%	Number	%
Prof., Tech. and Related Workers	61,474	8.1	39,594	5.8	21,880	28.4
Admin. and Manag. Workers	6,815	0.9	6,562	1.0	253	0.3
Clerical and related workers	82,764	11.0	73,608	10.8	9,361	12.2
Sales workers	114,215	15.1	112,953	16.7	1,262	1.6
Service workers	116,518	15.4	84,279	12.7	32,239	41.9
Agricultural workers, etc.	8,775	1.2	8,651	1.3	124	0.2
Production workers, etc.	307,402	40.7	297,817	43.9	9,585	12.2
Workers not class. by occupation	57,206	7.6	54,918	8.1	2,288	3.0
TOTAL	755,174	100.0	678,182	100.0	76,992	100.0

Source:- Second National Census of Iran, 1966 Tehran, Vol. 10.

service industries is explained by the fact that Tehran is the capital of the nation, and as such houses various government departments, embassies, and foreign legations. Also concentrated in the city are many hotels and restaurants. Employment in construction industry accounts for about 9 per cent of the total employed population and such construction projects as urban renewal, housing projects, and road construction are actively carried out in Tehran. A relatively high rate of about 8 per cent in the transport and communication industries is probably due to the fact that the present communication system is heavily dependent on public transport.

TABLE 3.16:

Employed Population of Tehran and Iran
By Major Industry Group 1966

	Tehran		Iran	
	Number	%	Number	%
Agriculture, Forestry hunt and	7,903	1.5	3,168,515	46.1
Mining and quarrying	440	0.1	26,312	0.4
Manufacturing	198,952	26.2	1,267,600	18.5
Construction	67,324	8.9	509,778	7.4
Elec., Gas, Water & San. Serv.	16,783	2.2	52,858	0.8
Commerce	137,399	18.1	552,023	8.1
Transport, Stor. and Coomun.	59,284	7.8	224,088	3.3
Services	244,399	32.2	929,685	13.5
Activities n.a.d.	22,690	3.0	127,539	1.9
Total	755,174	100.0	6,858,396	100.0

Source: Second National Census of Iran 1966, Tehran Vol. 10
Iran Vol. 168.

A comparison of the above information with the nation-wide employment structure shows significant differences (Table 3.16), indicating that while Iran is still dependent on agriculture and fisheries, the city of Tehran, as the most advanced city of Iran has an employment structure very similar to that of western cities.

Chapter 3: Notes and References

1. Estimated trend based on the 1966 Census.
2. This refers to an attempt to undertake the first nation-wide Census of Iran during 1939-40, which because of Iran's involvement in the war was not completed.
3. Bobek, H. 'Tehran', Geographische Forschungen Schlern Schriften, Band 190, P.16 1958.
4. See Appendix 1.
5. Nafisi, S. Tarikh-e-Siasi Va Ejtemai-e-Iran. 1345 (1966) Vol. 1, P.35. Tehran (Farsi).
6. Kinneir, J.M. Geographical Memoir of the Persian Empire. London 1813, p.77.
7. Kriziz's map of Tehran on a scale 1:20,700 has appeared in an article by J.E. Polak called 'Topographische Bemerkungen Zur Karte der Umgebung und zu den Plane Von Teheran', in Mitt-der K.K. Geogr. Gesell., XX PP. 218-225 (1877), Vienna, 1878.
8. Abdol gaffar Najm-ul-Mulk, 'Enumeration of the population of the city of Tehran 1286 A.H.' (1867).
9. Abdol gaffar Najm-ul-Mulk, 'Enumeration of the population of the city of Tehran, 1309 A.H. (1891) (See also appendix 1).
10. This ratio is based on the total population of the country of 11 to 11.5 million at that time, given by both M.H. Amani and J. Bharier. in 'A note on the population of Iran 1900-1966'. Population Studies, 22, pp.273-279, 1968.
11. Amani's suggestion of population growth rate quoted by J. Bharier *ibid*, P.277. and population Census of Tehran in March 1940 quoted by the National and Province Statistics. First Census of Iran November 1956, Vol. 1, P.5.
12. In 1966, the total population of Iran was 25.8 million, of which 9.8 million people were living in urban areas.
13. Jefferson, M. 'Law of the primate City' American Geographical Review, Vol. 29 pp. 226-232 1939.
14. The formula used by U.N. is $\left(\frac{P_1}{P_0} \right)^{\frac{1}{t}} - 1$ x 100 where
t = time P₀ = First Population P₁ = Second Population.
15. Department of Civil Registration and Statistics (D.C.R.S.) is a government office in charge of registration of births and deaths, established in 1928.

16. The formula is $\frac{\text{No. of children under 5 years of age}}{\text{No. of total population}} \times 1000$.
17. National Iranian Census of population and Housing, Nov. 1966, Tehran Vol.10.
18. Amani, M.H. "Demographic problems of the population of Tehran" in the First Seminar on Social Problems of the City of Tehran April 1962, Institute of Social Research and Studies, University of Tehran" Publication No. 21, Sept. 1964 (Farsi).
19. The formula is $\frac{\text{No. of Deaths}}{\text{No. of total population}} \times 1000$.
20. See Chapter 4.
21. From personal experience it has been observed that Oil Company Officials for example have invested in Commercial and building enterprises.
22. The availability of the two enumeration maps has facilitated such comparison, nevertheless because of their differing scales (1:5000 and 1:10,000) and their different size and boundaries of enumeration districts, the above five divisions are the most suitable ones for any valid comparison between the 2 Censuses.
23. Amani, M.H. "Density and movement of population in urban areas Tehran" Bulletin of Human Environment, 1970 P.57, No. 2, University of Tehran. (Farsi).
24. The U.N. reports consider technologically advanced countries as having 23-30 per cent of their population under 15 years. 10 per cent over 65 years 60-65 per cent between 15 and 64. Developing countries tended to have 40 per cent of their youth under 15 years of age only 2 to 4 per cent in the age group 65 and over and 56% between 15 and 64. The Determinants and consequences of population trends. N.Y., United Nations, 1953, SE/SOA/Jer. A/17, P.265.
25. First and Second National Census of population of Iran, 1956 and 1966.
26. See the sections on dependency ratio and literacy of the population of Tehran.
27. In the absence of data, a visible decline of middle age labourers especially in building activities can be a matter of concern.
28. Kamerschen, D.R. "On an Operational Index of Over-population" Economic Development and Cultural Change, Vol. 13, No. 2 Jan. 1965, pp. 169-187.
29. National Census of Population and Housing, Nov. 1966, Vol.10, Tehran Shahrestan, P.34.

30. Ginsburg, N. Atlas of Economic Development. 1960, Chicago.
31. First and Second National Census of Iran, 1956 and 1966.
32. Ibid.
33. 4th National Development Plan (1968-72). P. 117, 1968.

C H A P T E R 4

FUNCTIONAL PATTERNS & ACTIVITIES IN TEHRAN

To the geographer, function and form are essential features of any urban study. "Differences in either or both these intimately related aspects of urban morphology, function and form, give basis for the recognition of urban regions".¹ Commerce, housing, industry, agriculture and open spaces, all play their role in the differentiation of functional zones. Furthermore institution and transport functions mark their imprint on the urban area.

A city with great primacy such as Tehran functions not only as a centre for commerce but also as the administrative centre of an expanding nation, and one would expect commercial, business, administrative and governmental institutions to be concentrated there. These functions are the 'raison d' être' of the city and are treated first in this chapter. Coupled with the commercial function goes the supply and distribution of the goods which uphold the city's existence through complex networks of wholesalers and retailers. Industrial activity, attracted by concentration of capital and production, developed later in Tehran and is considered after retailing. With the attraction of the above functions and their development come the large influx and growth in the population which must be housed and provided with services and facilities. With a city the size of Tehran not only

must one consider such related phenomena as those above but the connections which are vital to the functioning of such a centre. A hierarchy of functions, in terms of the ideas expressed above has therefore been utilised in the following pages. The city is a centre with many diverse elements and all bear a complex relationship to one another. By abstracting we are generalizing but nevertheless it is hoped that some synthesis will be apparent in continuity and change in function and space.

A- Commercial, Wholesale, Retail and Service Activities

Commerce, as measured by the number of units is the most important activity in the city and in 1969 accounted for 54,935 of a total of 124,185 occupied work places (Table 4.1). However, the number of employees per unit varies from as many as 600 for a large banking establishment down to an individual shoe mender or shop keeper. In this section two main categories will be analysed. Firstly activities concerned with distribution, namely wholesaling and retailing; and secondly, commercial activities including hotels, banks, insurance offices and restaurants.

By the end of the Second World War, the rapid expansion of the city resulted in great distances between the main bazaar and the newly developed areas of the city. This necessitated the establishment of new retail shops in these areas.

TABLE 4.1:

Activities by number of establishments and employments 1963, 1967 & 1969

Major Activities	1963			1967			1969		
	No. of Establishments	No. of Employees	No. of Establishments	No. of Employee Establishments	No. of Employees	Ave. No. of Employees	No. of Establishments	No. of Employees	% of Establishment
Agriculture, Forest, Hunt and Fishing	N/A	N/A	1,350	4,583	1,455	4,830	4.3	4.3	1.1
Mines	N/A	N/A	52	1,075	54	1,083	20.1	20.1	0.1
Industries	30,037	110,721	41,176	191,520	41,290	203,668	4.9	4.9	33.2
Construction	1,094	110,042	2,516	14,903	2,265	14,366	6.3	6.3	2.1
Water, power & gas			258	6,690	259	8,286	32.0	32.0	0.2
Commerce, Banking insurance and real estate	38,452	79,959	54,935	126,215	54,689	125,494	2.3	2.3	43.5
Transport, storage and communications	1,437	8,282	3,007	20,762	2,554	26,409	10.3	10.3	2.1
Services	13,677	53,657	21,842	166,986	21,955	155,202	7.1	7.1	17.6
Miscellaneous	N/A	N/A	49	54	53	75	1.4	1.4	0.1
Total	84,697	272,718	125,185	532,788	124,574	539,413			100

Source: 1 Ministry of Interior, Industrial Census of Iran, 1963 Tehran District Series 1.2, Vol. 14 August 1963.

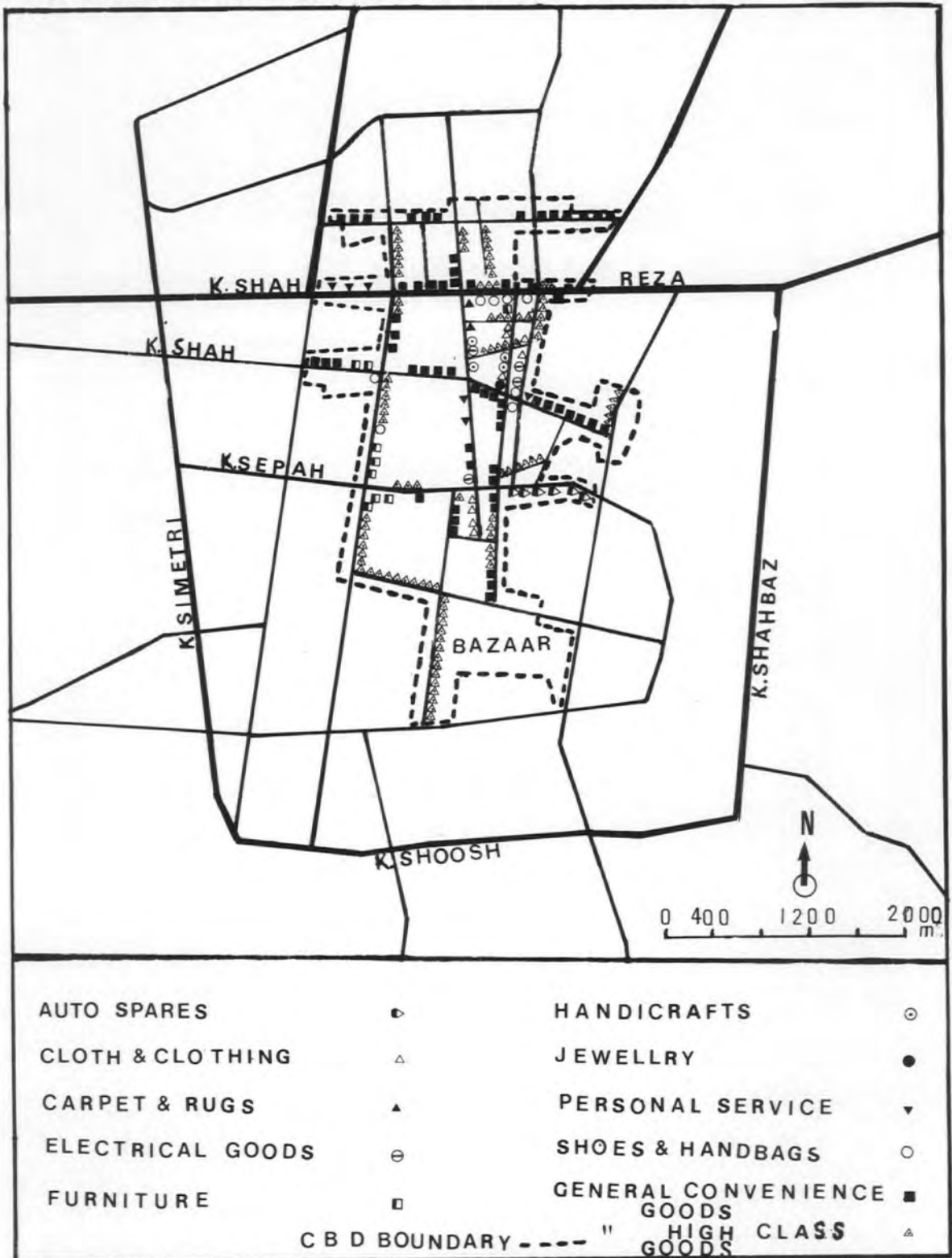
2 Ministry of Labour and Social Affairs Preliminary Report on the workplaces and workforce Tehran 1967.

3. Ibid 'Census Result of the workplaces and the work force of Tehran' Vol. 10, 1969.

Even in the post War period, data on the number of retail units in Tehran is limited. Furthermore, existing studies concentrate mainly on size and type of retail business rather than on their spatial distribution. Such studies include an Industrial Census of Iran 1963, a Statistical Survey of the Internal Trade of Iran, by the Ministry of Economy in 1965, Census Results of work places and the work force of Tehran carried out by the Ministry of Labour and Social Affairs in 1967, which was revised and added to in 1969. In addition, there is a survey for the Comprehensive Plan for Tehran which is the most detailed study of all. This section is, in fact, based on the data from these sources together with personal field survey although there are severe limitations to the data, particularly that for 1963 and 1965 which was based on a very small sample.

Central areas usually possess great diversity of function and are crucial in the activity ~~system~~ of cities. Figure 4.1, shows the general Central Area of Tehran and the pattern of the Central Business District found within it. From a business and commercial point of view, it is the most important area, for to the south it includes the bazaar and in the centre and north, a large number of the retail and wholesale establishments of Tehran. According to Farman Farmaian, more than one quarter of all retail shops were located here in 1966 and out of 48 classified hotels in Tehran, 36 were in this Central area.² This area is the central focus of the entire metropolitan area and region. It is the place associated with the highest land

FIG. 4.1 THE C.B.D. AND RETAILING GROUPS.



SOURCES: 1. FARMAN FARMAIAN, 1966.

2. FIELD WORK.

values, tallest buildings, highest density of land use and the greatest concentration of people during the day time. It is also a compact area, and serves as the centre for finance, insurance, banking, and government administration. Consequently it is the greatest area of employment.

Apart from the bazaar which functions as a specialized area, the chief shopping and business ribbon is Shahabad/Istanbul and Shah Khiaban and the main north/south khiabans including Saadi, Lallehzar and Ferdowsi. Here are found the greatest concentration of small and large sized stores, commercial firms, banks, insurance companies and hotels.

In the C.B.D., ground floor space is usually used for retail services, whereas the first and second floors are used mainly as private offices and in some avenues such as Saadi and Shahreza, the higher floors are for residential purposes. There is a high density of pedestrian traffic along the Shahabad/Istanbul and Shah Khiaban especially on the Saadi, Lallehzar and Ferdowsi Crossroads. The concentration of most of the banks' head-quarters such as Central Bank (Bank-e-Markazi), National Bank (Bank-e-Melli), Export Bank (Bank-e-Saderat) and Development Bank (Bank-e-Omran) together with some of the insurance companies, is of immense functional significance and exerts a functional pull over the entire metropolitan area.

I. Wholesaling

The pull of the city on resources of other parts of the country results in the ~~great~~ movement of goods into Tehran.

For their efficient collection and distribution within the city the wholesaling is essential. According to the Industrial Census in 1963, there were 2,258 wholesale premises in Tehran.³ In 1965 this figure had increased to 2,404.⁴ An increase in the number of wholesale establishment was indicated by the result of a survey carried out by the Ministry of Labour in 1969 putting the number of wholesale establishments at 6,074 with 270 establishments with more than 10 employees.⁵ Such an increase, although rapid, is understandable. This increase in demand is largely due to the population increase, but underenumeration in the former report is likely.

In overall terms an increase in the number of wholesale units especially for food stuffs is a direct result of increased communication between Tehran and the provinces through the paved roads and the increasing number of transportation means and the general increase in income. This last is certainly a reason why in Tehran different varieties of vegetables and fruits can now be found throughout the year, with decreased seasonal fluctuations. The bazaar has been the main place for the concentration of such activities from where goods were sent to nearby retailing units or premises outside the city. Location of wholesaling establishments, in general, tends to be related to the origin of the goods to be distributed. Since the wholesale units are space demanding, their presence in the C.B.D. is fairly rare. They usually are responsible for the receiving and distribution of

two main items; agricultural products and manufactured goods. Therefore according to the nature of the product the wholesale units tend to have locations related to the source.

Any definition of wholesaling activities within Iran is necessarily complex. This is because of the multi-functional nature of premises involved in different wholesaling activities. Several different functions may be isolated, as follows:

1. The collection and distribution of agricultural and manufactured goods locally, nationally and internationally.
2. The storage of the various products for long or short periods.
3. The changing of the form and nature of the products, e.g. packing, peeling, wrapping and drying.
4. The actual manufacture of goods combined and intimately connected with wholesaling.

A functional classification by type of activity provides a clear indication of the distribution of the various wholesale establishments.

The nature of Tehran is such that it is dependent on outside sources for the majority of its foodstuffs. Agricultural products are brought to the capital for consumption, or ultimate redistribution in an altered form. Wholesalers of agriculture goods (such as fruits and vegetables) tend to have a peripheral location close to the major external road networks, around the 10 major

maidans in the south of the city, the points of entry for such goods. Major wholesalers of fruit and vegetable are located beside the two southern and southwestern roads to Rey-Varamin and the old road to Karaj, by which roads, Tehran is connected to the agricultural areas of Varamin and Karâj. Similarly cereal wholesalers are located to the south of Khiaban-e-Mowlavi where the major external roads to Khorasan, Rey and Qazvin join Khiaban-e-Syrous and Shahpur. Wood wholesalers show a marked concentration around Maidan-e-Shahnaz where wood products from Mazandaran reach Tehran, and this area is associated with related industries such as ladder-making and carpentry. Non-perishable agricultural goods are still mainly distributed through the bazaar. Because of large distances now ^{or} separating the north from the south, price differentials are great and a recent trend is for certain products to be distributed by a second wholesaler located further north who takes advantage of the distance and sells to retailers at marginally dearer rates. Such 'secondary - wholesalers' can be seen on Khiaban-e-Roosevelt just south of Khiaban-e-Takht-e-Jamshid, and at the beginning of Khiaban-e-Amirabad near Maidan-e-24th Esfand.

Metal wholesaling shows a significant concentration along the south part of Khiaban-e-Shoosh, close to industrial manufacturers and to the railway station. Wholesalers of such things as electrical goods are located just north of the Central Area in Maidan-e-Ferdowsi and on the south part of Old Shemiran Road near Khiaban-e-Takht-e-Jamshid,

d

nearer to their major markets i.e. the high-class residential areas of the north. But in most cases involving modern consumer durables the pattern of wholesaling is confused and mixed with that of retailing.

II. Retailing

A retail establishment has been defined as a commercial unit whose goods are usually purchased by a final consumer. An outstanding feature of Tehran is the number of retailing units and their contrasting distribution patterns. As regards the evolution of retailing in Tehran evidence is very limited; what is known, however is that until the early 1920s' the units were much smaller and fewer. Furthermore because of the social and employment structure shopping habits were different from those of today. This was due to a larger number of bazaaris (merchants and traders) landlords and other high income groups who did much of their shopping for non-perishable foodstuffs from the Bazaar annually. In fact the Bazaar was the major centre of retailing for the then smaller built up area of Tehran and the highly concentrated population of the Old City and the immediate vicinity. Retail premises outside the bazaar were located in Sara, Timcheh and Carvanserai in the eastern and southern residential areas on either side of roads which at present are known as: Syrous, Pamenar and Mowlavi.⁶ There were also places known as Bazaarcheh

(small bazaars) with about 20 small shops in a roofed place in every Mahalleh (District) providing for the daily demands of residents. These bazaarchehs functioned as small shopping centres usually extending in a linear form along the main roads with a view to providing maximum accessibility. At the present time there are only a few such bazaarchehs remaining of which Nayeb-ul-Saltaneh on Khiaban-e-Rey and Qavam on Khiaban-e-Shahpaur are the most important.

In 1929, there were approximately 7150 retail premises in Tehran, which included 711 Qahvehkhaneh (tea shops).⁷ During the 1930's the physical expansion of the city, included the construction of major avenues and a large number of retail establishments along them.

By the end of the Second World War, the rapid expansion of the city resulted in the divorce of the main bazaar from the newly developed areas of the city, with great distances now separating them. This necessitated the establishment of new retail shops in these areas. Since then continuous expansion of the city was followed by an increasing number of retail establishments; a four fold increase in the number of such premises meant that by 1965 there were 27,027 units.⁸ In 1969 a rapid increase in the number of retailing units resulted in the number of existing establishments jumping to 44,997 units, almost 1 unit per 63 persons.⁹ This figure in comparison with 27,027 occupied units in 1965 shown an increase of 40 per cent. Such an apparently large increase may partly

be explained by the fact that the 1965 figure is based on a sample survey which may have underestimated the actual number of retail premises.¹⁰ However, there is still no doubt that there has been a rapid growth of retailing in Tehran, over the past few years.

Many factors help to explain such a large number and their recent rapid increase. Particularly important are historical and socio-economic influences which may be classified as follows: Firstly the increase of population and its pattern of distribution is certainly the most important factor behind the rise in demand for more retail space. This rapid growth has led to the expansion of suburban areas of Tehran which has resulted in the creation of a large number of local shopping areas and corner shops.

Compared with cities in highly developed countries the relative shortage of public and private transport has strengthened the demand for a large number of retail outlets throughout all residential areas. An increase in the level of family income as a result of the general rise in national economic prosperity, may however alter this trend.

The occupation of the population are reflected in many aspects of employment, such as the low percentage of employed people especially females in regular full-time jobs. In Iran as in many developing countries a fairly high level of unemployment and hidden employment encourages the establishment of retail units

and this is reinforced by the steady in-flow of migrants to Tehran who find this an immediate way of entering the money economy. Starting with limited stock and located in poorer parts of the city they are often financed by friends or relatives. Many hope that after a period of time they may move to a better selling area and improve their stock.

Using the data already mentioned an attempt is now made to analyse the distribution of retailing units in each of the 10 districts (See Fig. 3.1 for location of districts) and to consider the average numbers served by each unit. (Table 4.2).

TABLE 4.2: Number of Retail Units & Population Served in districts of Tehran 1967

District No.	District Population	Total No. of retail units	Total No. of occupied units	Vacant, closed & other units	Minimum average pop. served by each unit
1	322,319	4,095	3,971	124	81.0
2	169,125	6,107	5,995	112	28.2
3	383,275	4,966	4,884	82	78.4
4	388,001	5,793	5,573	220	69.6
5	340,612	9,874	9,604	270	35.4
6	265,664	3,016	2,921	95	91.0
7	330,587	3,613	3,498	115	94.5
8	252,042	2,915	2,845	70	88.5
9	123,162	1,312	1,289	23	95.5
10	273,438	4,204	4,114	90	66.4
<hr/>					
Tehran	2,848,225	45,895	44,694	1,201	63.8

Source: Ministry of Labour and Social Affairs, 1967. and Population Census of 1966.

This table has been prepared on the basis of an adjusted population of 1966 (calculated on the basis of a 6% per annum growth rate - See Chapter 3) and the workshop and retail statistics of 1967. The reason why the 1967 data has been used in preference to data for 1969 is that the survey is based on the same enumeration districts used in the 1966 population census. Districts 2 and 5, have the highest number of occupied retail units (5995 and 9604 respectively) but the smallest number of residents per unit (28.2 and 35.4 persons). These districts are the areas of most intensive shopping activity and cover the whole of the C.B.D. and include the bazaar. In contrast, district 9, with 1,289 retailing units has a minimum of 95.5 persons served by each unit and shows a completely different pattern. Two possible factors may help to explain the situation in this district. Firstly, it may be due to the existence of larger units such as super-markets and general stores or alternatively this area is mainly residential and its consumer demand is satisfied by a shopping area in an adjacent district or by Central Tehran. Although the minimum population served by units in the south of Tehran, does not differ greatly from that of the Northern districts there is a very significant difference in the number of retailing units between residential districts 6 and 7 and district 9. This is more evident if we consider the population density and income differences in these districts. In fact, it seems there is a negative relation between population density and income level and the number of retailing units. For instance the highly

concentrated pattern of population and low income level which characterised districts 6 and 7 are reasons why they have a high number of served population per retail unit similar to district 9. (See Table 4.2)

Having now considered the broad distribution of retail outlets by districts of the city it is of interest to analyse the contrasts ~~that exist~~ in types of shops between the different parts of the city. The bazaar is not included here but will be considered later.

The retail pattern on the main avenues of the central area shows general convenience goods, snack bars, cool refreshment shops, electric goods, tailors, shoe shops, confectioners' shops, miscellaneous stores and book shops. In the Central Area of Tehran there are good examples of specialized areas especially an area of carpet and antique shops on either side of Khiaban-e-Ferdowsi opposite the British Embassy, which attracts purchasers from different parts of the city as well as foreign tourists. There are also Jewellers on Khiaban-e-Lalehzar, who because of their ability to pay high rents can afford to locate very close to the highest priced land of the C.B.D. General book shops are extensively located on Khiaban-e-Shahabad whereas the shops for foreign books and magazines and musical instruments are located on Khiaban-e-Shah in the C.B.D. The most significant feature of another specialized area is the agglomeration of sellers of automobile spares in a linear pattern on Khiaban-e-Amir-Kabir extending for almost one kilometre. (Fig. 4.1). On those streets linking the main

avenues the pattern is extremely mixed and the size, shape and appearance of shops varies greatly. However, it is interesting to note that on some secondary streets retailers specialize in particular goods and articles. For example off Khiaban-e-Shahabad is Khiaban-e-Sepahsalar which extends for 500 metres and in which there are located more than 50 shoe shops selling pre-dominantly ladies and childrens shoes.

In the outer part of the Central Area of Tehran, the retail structure is more mixed. General convenience goods, stationers, grocers, bakeries, butchers, barbers shops and laundries are provided for the residents of these areas.

In recent years, the outward movement of retailing from the Central Area, has encouraged the development of new shopping areas especially on the northern avenues leading to Abbasabad. Khiaban-e-Takht-e-Jamshid and Boulevard-e-Elizabeth are thus now important locations for retailers. Here the retail trade has grown particularly because of easier access and parking spaces. Retail shops on Takht-e-Jamshid although fewer in number still show a degree of specialization particularly in textiles and fashion boutiques. Fashion goods, especially dresses are displayed in shop windows and provide a wide range within a comparatively small area and thus facilitate comparison and competition. The establishment in Khiaban-e-Takht-e-Jamshid of a super-market is a rational one for it is close to a prestigious residential area which includes foreign residents.

Relatively large corner shops run by Azarbaijanis are a dominant feature of the western part of Khiaban-e-Simetri and northern part of Khiaban-e-Shahreza. In other parts especially in southern Tehran, retail establishments are widely distributed throughout the residential areas. Here, multifunctional establishments which combine retailing, household industry and residence are common. Due to the lower income of this area, retail establishments mainly serve the local consumers' daily demands.

In considering the spatial distribution of retail outlets in the city 2 further categories are worthy of attention. These are cooperative societies and pavement traders.

The cooperative societies are a relatively new feature of retailing in Iran for the first of these premises was established in Tehran in 1944. In 1952, there were 1,200 and these had more than doubled by 1966. Organizations in the public sector have been important in establishing them and some in fact are now expanding for different government departments. Because many of these departments have their offices in the C.B.D. the cooperatives are usually located in the Central Area of Tehran. Goods are sold at a fixed price which is often very cheap because of bulk purchasing and they are increasing in popularity as goods bought are delivered to members homes. Many of the vegetable markets are also organized by the Municipality of Tehran as cooperatives: These markets mainly sell fresh vegetables and fruit, especially water

melons and melons, and are widely distributed throughout the city although they are usually located beside major maidans which are often the terminals of bus routes.

Pavement traders are another important element of the retail pattern of Tehran. Such traders number more than 15,000 who sell goods from stalls and trolleys with many selling lottery tickets. Their numbers are a revealing indication of the problem of unemployment and underemployment in Tehran. Pavement traders can be found in the Central Area especially in the streets linking Lalehzar, Ferdowsi and Saadi and also many other main and maidans throughout the city. They are a great nuisance to both pedestrian as well as vehicular movement.

It is also of interest ^{that} throughout the whole of Tehran small sized shops with less than 10 employees, are dominant. In fact in the whole of Tehran in 1969, there were only 154 retail outlets with a workforce of more than 10.¹¹ The majority are located to the north of Khiaban-e-Shahreza. There were only 5 major Departmental Stores within the whole of the city of which, The "Ferdowsi", "Iran" and "Sepah" are the most important. They are all located in the Central Area of Tehran although it is interesting to note that the Ferdowsi Store has opened two branches one in the northern suburb of Qulhak and the other on Khiaban-e-Shoosh to the south of the city.

Having analysed the growth, distribution and general characteristics of wholesaling and retailing in Tehran it is now necessary to assess whether there exists a hierarchy

of shopping centres within the city. The Comprehensive Plan for Tehran attempted to differentiate shopping areas into a hierarchical scheme based on those which are found in Cities of the Western World. Seven categories were suggested on the basis of a variety of functional characteristics such as the size of the population served as well as their spending power. These were classified as follows:

1. Local Centres with less than 15 shops serving between 500 - 5,000 consumers.
2. Neighbourhood Centres (having between 25 - 100 retail units and serving 10,000 to 20,000 people).
3. Sectional or Regional Centres usually having more than 100 shops and serving more than 20,000 persons.
4. Local Bazaars (i.e. in Shemiran and Rey).
5. Daily Bazaars (fruit and vegetable markets).
6. The main Bazaar of Tehran.
7. Central Shopping Area of Tehran.

Although such a classification claims to be hierarchical and comprehensive it can be criticized for the following reasons. Firstly, no recognition is given to the all important, often isolated, corner store. Secondly the daily fruit and vegetable bazaar is placed in the hierarchy above neighbourhood and Sectional Centres. Owing to the scattered location of these pavement sellers, alongside the main maidan of Tehran, it might be better included within the Central Area or in a sectional or

neighbourhood centre rather than as a separate category. Thirdly the classification ignores recent retail ribbon developments on either side of most of the avenues leading out from the Central Area as is seen for example on Pahlavi and the Old Shemiran Roads.

Taking Berry's classification of business areas in Chicago,¹² a more and accurate break down into retail categories in Tehran can be suggested. Berry considers three major categories of retail areas, as follows:

(a) A hierarchy of business centres, (b) Highway-oriented ribbons and (c) Specialized functional areas. Each category has a wide range of subcategories. Since such a classification is a model for a western city there are obvious dangers when applying the concepts to a city in the Middle East and it is necessary for example to add an additional category covering the bazaar economy, which is often a major feature of the retailing pattern of a non-western city. As will be shown, the bazaar performs a separate function and has several different characteristics from the modern shopping establishments of the Central Area.

(a) The hierarchy of retail centres:

In general the evolution of the retail pattern in Tehran has grown outward, so retailing in the Central Business District has developed in response to new demands. The present C.B.D. dates from the city expansion of 1870 onwards when the present south-north Khiabans of Ferdowsi, Lalehzar and Saadi came into existence. Furthermore the structural changes to the city landscape in the 1930's

resulted in the creation of the two other important East-West Khiabans, Shah and Shahreza, which at present function as two of the most active retailing areas of Tehran City. This Central Area of Tehran represents the retail core of the city. Here both land values and pedestrian flows reach their peak along Khiaban-e-Shah and Ferdowsi. It is not surprising therefore that large multiple stores such as "Ferdowsi Department Store" and "Iran's Great Store" are located along this section of maximum pedestrian flow. As is shown on the map of retailing groups in the C.B.D. of Tehran, this area has mainly been converted to shops selling durable goods. (See Fig. 4.1).

In spite of the prosperity and advantages that exist in the C.B.D. of Tehran such as the area of the greatest population catchment, the point of maximum accessibility with highest pedestrian flows and the easiest comparability with goods and shops for the shopper, it has several disadvantages. These are namely the relatively high rent and "Sarqofli" (Key money)¹³ and the high level of traffic congestion. The competition between retail and business establishments for the limited land within the Central Area has created a hierarchy of rent paying ability. Different activities pay increasing amounts of rent depending on their ability to maintain a location increasingly accessible to areas of peak pedestrian flow. This may lead, as in Tehran, to a shortage of suitable sites for large retail developments and adds to the problem of traffic congestion. Increasingly

volumes of road traffic through the Khiabans of the city centre have necessitated the creation of certain one-way street systems as along Khiaban-e-Lalehzar. These problems, together with the dispersal of the population from the older parts of the city and the general population increase in the newly developed areas have resulted in the creation of a number of local, neighbourhood and regional centres. This pattern is perhaps due to the fact that residents in the suburban areas have found it more convenient to shop in the vicinity of their houses. This trend can be supported by the recent emergence of a relatively large number of medium sized super markets and general stores in an area between Khiaban-e-Sharrezā northwards to Maiden-e-Tajrish.

The location of selected retail centres in Tehran is shown in Fig. 4.2. Development of these suburban centres, as has been mentioned, is closely related to the expansion of the city's suburbs. Table 4.3 shows their major characteristics such as size, type of goods and average sales. This study by Farman Farmaian was the first attempt to try to place shopping centres in a hierarchical structure although any categorization is somewhat arbitrary as it is based on limited statistical inputs such as the number of establishments, an estimate of the population served, and the degree of accessibility to consumers. It must be realized, however, that these centres are totally unplanned, and in addition local corner shops are scattered throughout the city, especially in the old housing areas to the south.

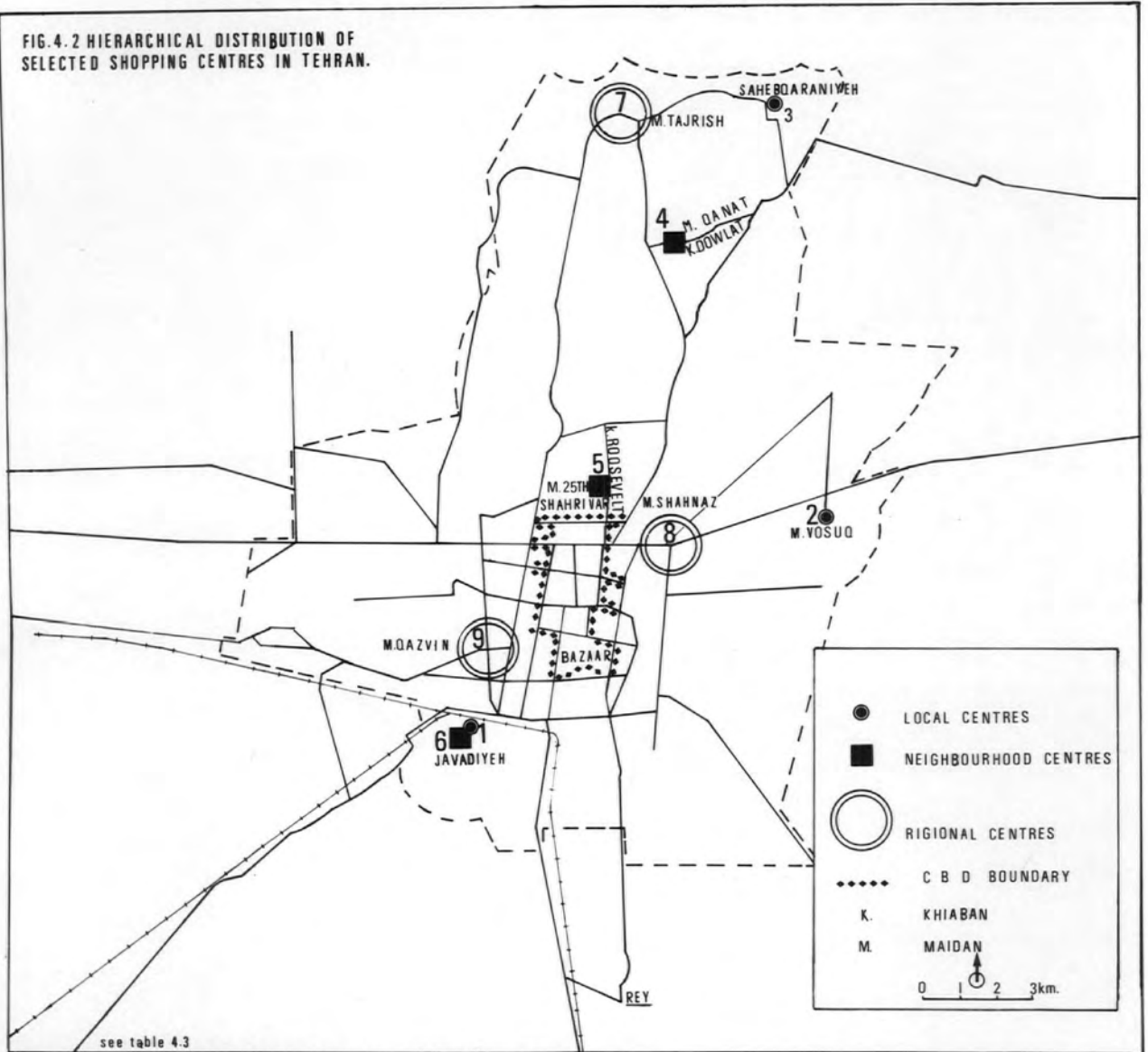
TABLE 4.3:

Characteristics of selected shopping centres of Tehran, 1966

	Local Centre	Neighbourhood Centre	Regional Centre
Centre Number	1 2 3 4 5 6 7	8 9	10 11 12
Number of retail units	11 9 6 4 33 49 100	138	234
Number of shops selling convenience goods	7 4 2 2 16 17 80	57	67
Number of shops selling Durable goods	3 - 1 20 20 5	61	128
Personal services ¹	1 5 3 7 12 15	20	39
Average number of floors	2 2 1 1-2 3-4 2	2-3	2-3 1-2
Average Age of establishment	15 5 3 10 5 20	15	15 20-30
Area of establishment in sq. metre.	12 12 70 30 50 12	20	14 20
Total sum of sarapabli (key money) in Rials	30,000 45,000 500,000 400,000 500,000 40,000	300,000	500,000 400,000
Ave. Annual sale of convenience goods in rials per sq.m.	30,000 39,000 80,000 31,000 81,000 33,000	55,000	106,000 30,000
Ave. Annual sale of durable goods in rial per sq.m.	27,000 - 180,000 81,000 75,000 20,000	80,200	50,000 45,000
Ave. Annual sale of personal services in Rials per sq.m.	12,000 13,000 75,000 34,000 13,000 12,000	37,000	62,000 48,000

* Source: Comprehensive Plan for Tehran First Stage Vol. 2. 1966.

FIG. 4.2 HIERARCHICAL DISTRIBUTION OF
SELECTED SHOPPING CENTRES IN TEHRAN.



SOURCE: FARMAN FARMAIAN, 1966.

The local centres shown in Fig. 4.2 and identified as Numbers 1, 2, 3 are minor centres serving a population of up to 5,000. However, a comparison of even the local centre of Javadiyeh (No. 1) and Saheb-qaraniyeh (No. 3) shows that there are marked contrasts between them. For instance, out of 11 retailing units in Javadiyeh, 7 units sell convenience goods, 3 consumer durables and only one offers personal services, whilst out of 6 establishments in Saheb-qaraniyeh, there are 2 shops selling convenience goods, one selling durables and 3 dealing with personal services. In this case, however there is a remarkable difference between these centres both qualitatively and quantitatively. In the case of "Sargofli" there is an even more striking contrast, for example owners of a retail establishment in Saheb-qaraniyeh have to pay a total of 500,000 Rials which is almost 17 times the sum paid in Javadiyeh. (Table 4.3). Such differences are mainly due to the fact that establishments in the north are larger in size and more accessible to consumers of higher income groups.

Neighbourhood shopping centres serve the extended suburban areas, and are particularly important in the north of Tehran. Maidan-e-Qanat in the northern suburb of (Maidan-e-Qulhak and 25th Shahrivar in the middle of Khiaban-e-Roosevelt are two good examples. (Fig. 4.2 Nos. 4 and 5). These centres each have between 25 to 100 retail units and serve a population of between 10 - 20,000. Compared with Javadiyeh 80 out of 100 retail units sell such goods. Another important contrast involves the

difference of the total sum of "Sarqofli"; in the northern centre it is almost 12 times as large as the sum in the southern shopping neighbourhood. (See Table 4.3)

Tehran plays a dominant role in its region's retail structure. Regional shopping centres have not only developed on the periphery of the central area but also in selected suburbs, predominantly in response to regional consumer demand. As shown in Fig. 4.3 the two Regional Centres sampled are in the south west and eastern part of the city and have grown up around two major maidans on highways which lead out from the city. These maidans are major terminals both for internal and external bus services. Indeed, their particular location with regard to the city and region enables them to provide a range of services for the entire Tehran region. For instance Maidan-e-Qazvin (Fig. 4.2 No. 9) can be regarded as a specialized centre for auto services and spare parts for agricultural machinery. A high degree of accessibility results in a high total sum of "Sarqofli" which in the case of Maidan-e-Shahnaz, to the east (Fig. 4.2 No. 8) can rise to half a million Rials for even small premises. Maidan-e-Tajrish to the north, (Fig. 4.2 No. 7) functions as a shopping centre for both the city and the suburb of Shemiran. As a result of northward movement of high class Tehranis this centre has developed a mixed pattern of retail premises for both high class families and low class Shemiranis. The former category satisfy their consumer demand from the new shops developed on the frontage of the two maidans of Sar-e-Pole and Tajrish and the avenue connecting them to each other;

Whilst the local bazaar of Tajrish is mainly engaged in the provision of local goods for the majority of Shemiranis.

As a general rule, the higher the order of a centre, the greater the tendency for its morphology to follow a nucleated pattern. There is also a close correlation between the accessibility and, to some extent, the size of premises with the total sum of "Sargofli", which in turn is a reflection of frontal land values on the main Khiabans.

A general comparison between the Central Area of Tehran and all types of suburban centres shows that a relative decline in convenience goods sales is likely to continue in the Central Area. This trend is due to the increasing number of medium sized super markets and general stores in the suburbs especially to the north. Such a trend, is very likely to continue as a result of changes in both the "demand" for retail goods, population increase, its changing distribution and density, mobility, income levels and the frequency at which goods are bought, as well as changes on the retail "supply" side. These latter include rising retail productivity with the growth of larger units and also changes in the nature of goods sold especially the increase in canned and preserved foods. The study of the interaction between these factors can thus help to explain the complexity of the hierarchy of the retailing patterns within Tehran.

(b) Highway-Oriented ribbons:

Whilst the ribbon development of retailing is a feature of the spatial growth of many cities, the most important of such development in Tehran is to be found to the north. It has arisen as a result of an increasing demand for service provision on the major highways. Services including auto services, restaurants and motels are usually intermixed with retail outlets. Usually they are located on both sides of the major roads leading out from the city. The pattern is most marked in the high income areas where there is a relatively high level of private car ownership.

Old Shemiran and Pahlavi Roads are good examples of such development. For instance the existence of a large number of auto services on Old Shemiran Road and the increasing number of restaurants and snack bars on Pahlavi Road are evidence of this trend. The development of these services emphasizes the growing importance of the motor car in shopping patterns in these northern areas and is something which is already a common feature in western cities. The existence of a large number of auto services at the south of Old Shemiran Road in fact is an example of a specialized area very much associated with the high level of car ownership in the northern part of Tehran. A combination of these services with other service establishments such as restaurants and hotels, produces a contrasting picture quite different from those on either side of highways in other directions from the centre of the city which are mainly occupied by garages, auto services

and warehouses associated with low class residents and a low level of private car ownership.

In a city such as Tehran, with its dynamic trends in urban growth the development of such highway oriented retailing is likely to continue, with the existing and proposed highway network providing suitable locations for further developments.

(c) Specialized Retail Areas:

In cities in both the developed and developing world the agglomeration of similar types of retail, service and administrative establishments is a common phenomenon. Tehran is no exception. This grouping in parts of the city is a direct result of competition between establishments which enable the buyers to conduct "comparative" shopping for price and quality of products.

In Tehran there are many examples of such specialized areas. For instance the concentration of auto spare parts retailers on Khiaban-e-Amir Kabir, and auto repairers at the south part of Shemiran Road. At the western end of Khiaban-e-Shah, there is another specialized area, for although essentially an extension of the C.B.D., lower rents and low "Sarqofli", have attracted specialized activities unable to pay the high rents of the C.B.D. such as second hand furniture shops. Table (4.4) shows a 14% increase of these second hand shops. This is mainly related to the population increase particularly associated with the areas of low to middle income migrants from the provinces, in the western part of the city.

TABLE 4.4:
Type of retail and retail/wholesale activities
in Tehran 1965 & 1969

Type of retail activity	1965 ⁽¹⁾	1969 ⁽²⁾	% change
1. Grocers & food sales	12,802	17,448	24
2. Green grocers and fruit	2,040	4,807	57
3. Cloth & clothing accessories	4,662	6,508	28
4. Leather products including footwear	612	1,233	50
5. Jewellery	156	282	48
6. Bookshop and paper products	413	747	44
7. Household goods	3,236	4,954	32
8. General stores including super markets	64	118	46
9. Second hand goods	674	766	14
Type of retail/wholesale activity			
1. Agricultural and livestock products	653	911	38
2. Forest products	566	576	2
3. Construction materials	1,116	1,816	39
4. Metal and metal machinery	1,279	1,729	31
5. Wood products (excluding furniture)	163	261	37
6. Oil sellers and Gas stations	649	738	12
7. Rubber products	54	128	57
8. Chemical products	867	1,220	29

Sources: 1. Ministry of Economy 1965.

2. Ministry of Labour and Social Affairs 1969.

Whilst the bazaar has already been mentioned it seems most appropriate to analyse it in detail under the heading of "Specialized retail areas". This view could be substantiated on the grounds that although it is a multi-functional area, selling of goods is still its dominant function. The bazaar may be defined in several ways. In

studies of urban morphology such as that by Brown it is defined as "the agglomeration of large and small shops, warehouses and workshops, aligned in streets that are usually covered."¹⁴ It is a market place with intricate lanes, signifying a distinct land use region. From an economic point of view, it is an institution for trading and commerce. As well as including retailing and wholesaling of local, provincial and foreign goods it also includes some small scale manufacturing of consumer goods. Sociologically the bazaar represents pressure groups of merchants and businessmen who exert a powerful control on national finance and at times are even prepared to defy government policy and good business ethics.

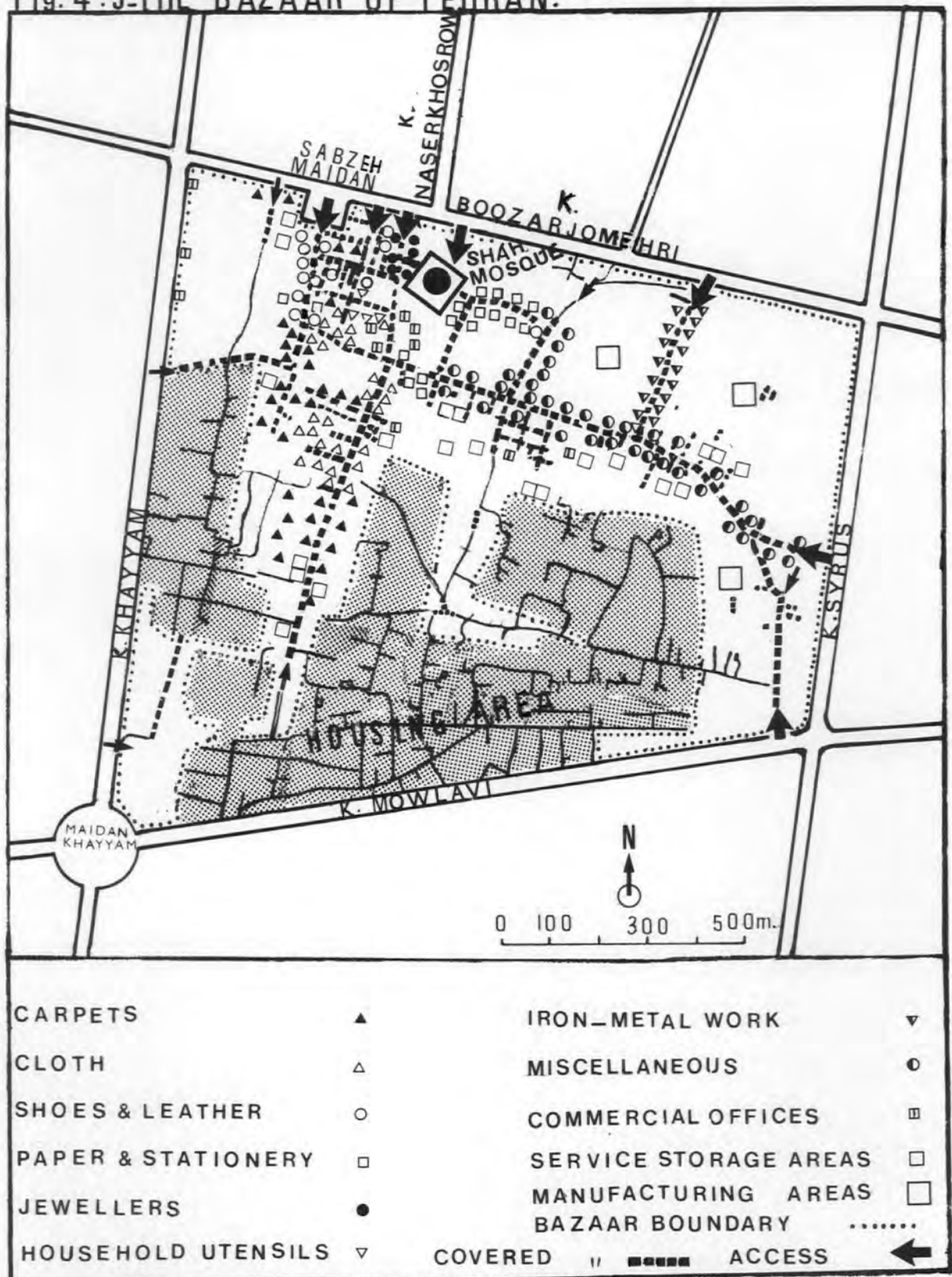
The bazaar of Tehran which can be studied as an important specialized area of the C.B.D. is located in the southern part of the old city of Tehran and covers an area of approximately 65 hectares. The site of the present covered bazaar is the same as in 1553 when it was built although additional building and rebuilding took place in the 19th century. Starting in the 1830's, the two main streets of the bazaar were extended. Firstly the N-E and N-S covered avenue which connected the Arg in the north to the Shah-Abdul Azim gate in the south, was extended. The link between the Arg and the gate to Rey through the bazaar indicates the importance of the bazaar as a meeting place for people from the governing sector (as illustrated by the Arg as the palace of the ruler), the economic sector (the bazaar) and the religious sector (Shah Abdul Azim or

Rey). As a result the bazaar represented a complex socio-economic and political unit in the 19th century. Secondly the north-south covered avenue which is of a slightly later date includes the Bazaar-e-Abbasabad (built in the 1830's) and the Bazaar-e-Amir (built in the 1850's).

During Reza Shah's modernization of Tehran in the 1930's the bazaar was left untouched, and the northward extension of the built up area resulted in an increase in the distance between the bazaar and the high class areas in the north.

The expansion of the bazaar since 1945 has been minimal and 90% of the present bazaar is covered by the same roofs as in the 19th century. The movement of some of the functions from the bazaar, for example mosques, hammams (public baths), and Qahveh-khanehs (tea shops) has meant that the social importance of this area has also declined. Hence today the bazaar of Tehran is predominantly an economic complex in which there are more than 3,000 retail and wholesale units, workshops, carvanserais, private offices and different branches of banks. Retail shops are usually small and two storeyed with the upper floor functioning as an office. They generally show marked specialization by product and similar traders are usually located together. Fig. (4.3) shows the grouping of jewellers and stationers on either side of the Shah Mosque to the north, shoe-makers to the south of the Sabzeh-Maidan and the agglomeration of carpet sellers in the Bazaar-e-

Fig. 4.3-THE BAZAAR OF TEHRAN.



SOURCES: 1_ FARMAN FARMAIAN, 1966.
2_ FIELD WORK.

Abbāsabad to the south of the main north-south covered avenue. This in fact reflects a traditional segregation where a particular street or quarter was reserved for a special commodity and group of merchants. Nevertheless this grouping is now breaking down as can be seen where a number of carpet sellers have recently moved to the northern entrance of the bazaar just beside the street of shoe-makers. The location of the Bazaar-e-Abbāsabad away from the main northern entrance of the bazaar has been the main reason. Easy access for buyers especially for foreign tourists has encouraged and increased this movement to more accessible locations. Parallel with these activities the bazaar functions as a lending institution. Before the establishment of modern banking facilities it was and still is the main source of ready capital, providing both short and long term loans to all sectors of the community. As Benedick has pointed out, "The main distinction between the bazaar and modern Persian commercial banks is the impressive buildings housing the latter".¹⁵

Many transactions within the bazaar however tend to be informal and geared to personal relationships and it is more significant to have important guarantors to promissary notes than general credit worthiness in contrast to the very formal and lengthy activities of the large commercial banks. Fewer questions are asked but higher interest rates are charged, for example an average interest of 25% in the bazaar compared with 12% in the banks for a similar loan. The commercial banks are

associated with the planned investment of capital whereas the bazaar money lenders have no such associations and thereby assist in the maintenance of a free-market.

Apart from retail commercial activities, the bazaar includes 70 workshops which have more than 10 workers. The product of these workshops are mainly leather goods, shoes, wood and especially metal goods. Segregation of industry is also visible and Iron-workers are located in large numbers in the north east of this bazaar. According to a survey the average daily sales in the bazaar vary greatly from shops of the same size and selling the same commodity, have markedly different turn-over.¹⁶ For example a jeweller's shop or a household goods shop may sell goods to a value of 1,000 Rials per day and the other sell goods to the value 40,000 Rials per day. Some specialized shops such as carpet sellers have a very large turn-over, of up to 100,000 Rials in a single day's trading.

In spite of its thriving appearance, the daily sales in the bazaar are declining and an outward shift of retailing, especially towards the north part of the city can be seen. The reasons for this are numerous and varied but may be summarized as follows:-

(1) The northward expansion of the city's built up areas has resulted in the northward shift of the centre of gravity of the city, from the point of view of area, population and income distribution.

(2) An increase in the number of middle class families in the northern part of the city, has been followed

by the creation of a number of retail units.

(3) Access to the bazaar is difficult.

(4) The absence of a motorable road inside the bazaar leads to difficulties in shopping as well as creating problems for the transportation of heavy goods from outside. This in turn has resulted in a number of wholesalers shifting their premises outside the bazaar.

(5) Social and religious institutions which were formerly concentrated around the bazaar have been built in other parts of the city.

(6) Changes in the pattern of distribution of goods, have occurred and retailers who used to purchase from middlemen in the bazaar now tend to obtain goods straight from the producer. This is especially noticeable in areas furthest removed from the bazaar.

(7) Finally the physical nature of the bazaar limits any real possibility of further expansion.

3)

(d) Personal Services:

In comparison with retail and wholesale activity, personal services are of less importance. However, as a capital city with a large population, Tehran contains a wide range of personal services. During the last two decades especially during the 1960's, these services have expanded rapidly both qualitatively and quantitatively. However, this increase has not been equal for all services. There are some major factors behind this expansion as well as rising income levels are the most important. However, the influences of westernization and increasing contact

through the communications media have accelerated trends especially in the rising quality of services. This is reflected for example in the development of services such as hair dressers, and car hirers. The following table is based on population data for Tehran for 1966 and establishment data for 1969. It relates the numbers of personal service units in Tehran with the number of persons served per unit.

TABLE 4.5
Number of establishments and population served by major commercial services.

Type of service	No. of units ⁽¹⁾ (1969 Figures)	No. of persons ⁽²⁾ served per unit (1966)
Laundry and dry cleaning	1501	1812
Public bath	675	4030
Hair style and Barber shops	4034	673
Photographic studios	513	4840
Restaurants and Eating Establishments	5341	530

Source: (1) Ministry of Labour and Social Affairs Census Result of the Workplaces and Work force, Tehran Vol. 10, 1969.

(2) Second National Census 1966 Tehran Vol. 10.

There are a number of salient features evident from the table. Particularly noticeable is the ubiquity of hair stylists and barbers, more than 4,000 units, serving an average population of 673. The same generalization applies even more to restaurants. Public baths are characterised

by fewer individual units but a larger population is served, (over 4,000 persons per unit). This is a direct result of the greater number of housing units with private baths. Photographers and laundries are still far from widespread, though increasing rapidly in numbers owing to rising personal income and growing demand for these specialized services.

III Selected Services in Tehran; their growth and spatial pattern:

In this section the functional pattern of a selected range of services will be considered. Such services include banks, financial offices, insurance offices, estate agents, air-line agencies, and hotels. Indeed, the dominance of Tehran in these activities, as in wholesaling and retailing, is again evident. This is explained by Tehran's role not only as a large capital city but also because of its growing importance on an international scale and housing the Iranian offices of many world organizations such as the major oil companies and branches of United Nations Departments. The importance of Tehran in this sphere is reflected in the high percentage of the population engaged in service activities. According to the 1966 census, of the total employed population over 10 years old, those employed in secondary industries accounted for 63.6% of which the service industries had the largest share of 32.2 per cent, commerce 18.1% and transportation 7.8%.¹⁷ The large number of employees in the service industry is due to the fact that in Tehran, various government functions, embassies and

legations of many countries are concentrated together with many establishments such as hotels and restaurants.

As a general rule these services tend to have a central location in order to derive advantages from proximity to the other commercial and business activities of the Central Area.

With the exception of certain distinctive areas such as administrative and banking quarters, the land use pattern of offices in Tehran is characterized by general inter-mixing with wholesale and retail establishments. In detail this consists of retail and wholesale functions occupying ground floor locations with commercial offices occupying the first floor and above. With the northward expansion of the retailing area, a similar tendency is apparent in the case of offices. Khiaban-e-Shahreza, Pahlavi, Takht-e-Jamshid and Takht-e-Tavoos are the best examples of such a northward trend. Here there are 4-5 storey blocks totally occupied by offices. This building of tall office blocks is encouraged by the high land prices on the fronts of the avenues and is now made possible by the growth of high-rise construction techniques.

Having mentioned the overall importance of service functions in the urban life of Tehran certain commercial enterprises will now be analysed in more detail.

(a) Banking and Financial Offices:

The rapid growth of Tehran is partly a reflection of its commercial activity and financial prosperity. This can

be supported by the fact that 18.1% of the employed population in 1966 were engaged in commercial activities. As well as this $\frac{1}{3}$ of the total Gross National Product was concentrated in this city together with 60% of total investment as a direct result of heavy capital investment from internal and foreign sources. This concentration of finance within the capital has greatly encouraged banking activities. As a general rule, there is a tendency for banks and other financial institutions to locate near to each other. Such a specialized banking area may be seen close to the peak land value core of the C.B.D. of Tehran. This area is located on the southern part of Khiaban-e-Ferdowsi, between Khiaban-e-Shah and Sepah, where the four major banks have their head quarters. These are Banke-e-Markazi (Central Bank), Bank-e-Melli (National Bank), Bank-e-Rahni (Mortgage Bank) and the National Saving Bank together with branches of other banks.

The increase in the number of bank head quarters and the spread of their sub-branches throughout the city can be attributed to the rising profits in this sector and to the rising demand for loans at a reasonable rate (8% to 12%) for purposes of house construction, the establishment of industrial enterprises, and the increasing number of people who favour the greater security of a bank for depositing money.

This growing importance of banking has resulted in an increase in the number of banks. These include both government owned and private ones as well as

those in partnership with foreign companies. At present there are 26 head offices of banks in Tehran of which 10 are state owned the rest being private or involve foreign capital. To facilitate access, sub branches of these banks have been opened throughout the whole of the city. By 1969 there were 710 banking establishments and associated buildings in Tehran.¹⁸

As well as banks there are other important financial institutions, these include currency exchange shops and estate agents who cash cheques and lend money. These are mainly located in the city centre on Khiaban-e-Saadi and Ferdowsi or in or near the bazaar. Not far from the central banking area, to the north of Khiaban-e-Ferdowsi and just opposite the British embassy are located more than 20 money exchangers forming a specialized area. These are mainly responsible for providing individual short term loans and charge very high interest rates. Such a cluster is, in fact, due to the existence of several foreign embassies which include those of Britain, Germany, Turkey, Russia and Denmark. This agglomeration is very much encouraged by other factors. For instance because of the existence of other specialized shops such carpet and antique shops this part of Khiaban-e-Ferdowsi is one of the most important places for foreign tourists who may need to change their own money into Iranian currency. Furthermore since the sum of foreign exchange given by the Bank-e-Markazi to Persians who want to travel abroad is limited (approximately 200 pounds) these money exchangers benefit from their proximity to the banking areas of south

Khiaban-e-Ferdowsi, in that, although higher rates of exchange are operative, money is readily available. This emphasises the importance of Khiaban-e-Ferdowsi as one of the most important commercial areas in Tehran.

(b) Insurance Offices:

Insurance agencies have been developed relatively recently in Tehran and particularly since the Second World War as a result of the further contact with foreign countries. It is now a rapidly growing sector similar to the other commercial activities. This growth has been encouraged by the government's own insurance schemes for its employees and also by private accident insurance policies. At present, there are 15 insurance offices which are mainly private. The total number of head quarters and sub-branches in 1969 accounted for 69 units which were usually located in the C.B.D. especially on the southern part of Khiaban-e-Saadi and Khiaban-e-Shahreza near Maidan-e-Ferdowsi.¹⁹

(c) Estate Agents:

In 1969 there were 2,751 estate agents who dealt mainly in land speculation and real estate building.²⁰ The large number of such agencies reflects significant feature of the city's economic scene, that is land speculation activities through which many speculators in Tehran have made large profits. This has been encouraged by the construction of low quality building and by the availability of relatively cheap land on the city periphery, together with massive im-migration from the provinces which in turn has brought a constant demand

for construction of housing units. The distribution of these agencies is scattered, but peripheral avenues provide significant locations in view of the fact that vacant land is mainly to be found on the city periphery. Khiaban-e-Amirabad, and Eisenhower Road, Old Shemiran Road and Nezami (Abbasabad) Road are the most important.

As a result of the large numbers of these agencies, Tehran, has become a focal point for real estate activities. In spite of recent government regulations (see chapter 5, on government policy in housing) this trend still continues. There is particular evidence of this activity in the north west of the city, where the future extension of Tehran is planned. This may result in problems between speculator, ordinary buyers and government planning authorities. For example when government policy for a specific area is for low class housing, speculation may have been so intense, and land prices may have risen to such an extent that the planned direction of growth may be altered.

(d) Air-Line Agencies:

Tehran plays an important role not only as one of the major Middle Eastern cities but also as an international cosmopolitan centre. The holding of international conferences, diplomatic and socio-economic congresses have all increased still further the international status of Tehran. Its particular location at a cross roads between the Eastern and Western World has been reinforced by its favourable location on a very busy network of world air-routes.

At the present time more than 20 International

Air-Line agencies have their offices in Tehran and Mehrabad Airport has more than 50 flights per day. This airport is not only responsible for the International flights but also connects Tehran with most of the major Iranian cities for which the Iran National Airlines Corporation (HOMA) and its Agents in Tehran are responsible.

Offices of the Air-Lines are located in a functionally specialized area on Khiaban-e-Shahreza, especially around Maidan-e-Ferdowsi, and on Khiaban-e-Villa. With the great increase in the number of foreign and local tourists in Iran within recent years there is great potential for further expansion of Air-line agencies in Tehran. Indeed, the proposed second international airport to the southwest of the city will encourage this trend and will become a top priority should Iran go ahead with its preposal to purchase three Concorde aircraft.

(e) Hotels:

The location of Tehran on the "Asian Highway", as well as its rapid growth as an international city linked to major world air routes has contributed to its growing importance as a tourist centre. Approximately one quarter of the tourists arriving in Tehran from abroad stay on average for four days.²¹ Yet the importance of internal tourism is still far more important to Tehran's economy, as Iranian tourists to the city outnumber those from abroad by 12 to 1. As a result of an improvement in tourist facilities, Tehran in 1969 contained a wide range of hotels, which

included 48 classified hotels and 184 unclassified poorer hotels or lodgings ("mosaferkhaneh").²² The latter have a distinctive distribution associated with inter-city bus terminals and railway stations. For instance Khiaban-e-Amir Kabir, Khiaban-e-Naser Khosrow and Railway Square are places which include these establishments.

The great majority of classified hotels are located in the Central Area of Tehran. This is a direct result of the demand for accessibility to the commercial and administrative areas of the city centre. At the same time they are located away from areas of maximum traffic congestion and street noise of the core of the C.B.D. The great majority are situated between Khiaban-e-Shahreza and Takht-e-Jamshid with many on this latter khiaban. A classification of hotels by I.N.T.O. (Iran National Tourist Organization), recognizes 5 different categories. Of the 48 classified hotels in 1967, 15 were luxury, 10 first class, 6 second class, 11 third class and 6 fourth class hotels.²³ It is interesting to note that only 2 of the third and fourth class hotels are located to the south of Khiaban-e-Shahreza whilst there are only five luxury and first class hotels located to the south of this Khiaban. Luxury and first class hotels comprise almost half the city's total and they are mainly used by wealthy Iranians and Americans.

Due to the growing commercial and political centrality of Tehran it seems that the need for construction of hotels in future will be even greater. As the number of Asian

and European tourists will still exceed all other tourists the provision of a larger number of middle priced hotels is essential. However, during 1971, a further development in tourist activity resulted in the creation of three new large luxury hotels in northern Tehran, built by international hotel companies such as the Sheriton Chain and the Inter-continental Group, with some share capital being provided by the Iranian Government. Following the construction of the Asian Highway connecting Tehran to Europe and South East Asia, together with the extension of the European Oriental Express which connects Tehran by railway to Europe, Tehran will receive a larger influx of tourists which in turn will lead to an increase in the need for more hotel construction in the city.

B. Industrial Areas

The importance of industry on the urban growth and economic prosperity of Tehran has already been mentioned. In this section the location and different characteristics of Tehran's industry will be discussed. The industrial areas of Tehran and its environs in 1966 covered some 18.9 square kilometres.²⁴ In the centre and south of Tehran long established, small-scale domestic industries are located. Since the industrial units concentrated in this area are multi-purpose, the calculation of the area covered by them is very difficult.

The industrial diversity of Tehran could be considered a factor guaranteeing its economic stability, and a new trend in the modernization of industry has increased both the efficiency and the output of factories. Consequently a

labourer in a factory in Tehran earns, on average, 2.35 times the amount of a labourer in a similar factory in other parts of the country. It is therefore not surprising that 19 per cent of the country's total industrial work force is in Tehran, and earns up to 60 per cent of the whole country's industrial wages.²⁵

According to surveys made by Plan Organization, more than one third of all national investments (excluding oil), and two thirds of foreign investments has been allocated to the industrial sector in Tehran and its immediate vicinity. As a result of such concentration, 51 per cent of Iran's industrial production comes from Tehran.²⁶ The same survey indicates that 31 per cent of the factories (with more than ten labourers), 37 per cent of the labour force, 58 per cent of sale value, and 62 per cent of the added gross product of the country are in the Tehran area.

Since Iran is in the early phases of industrialization, most of its industries fall in the category 'light industry', including such things as textiles, footwear and foodstuffs. The above categories represented 44 per cent of all Tehran's industrial employment in 1963.²⁷ Since then however conditions have improved slightly, as the proportion in 1969 had been reduced to 42.1 per cent of total industrial employment.²⁸

A chronological study of industrial development in Tehran, shows that the southern part of the city was the place in which a distinctive industrial area originally

developed although traditional handicrafts were of course associated with the bazaar in the centre of the city. Industrial establishments are normally located with regard to the greatest profitability. However different factors are involved in the location of an industrial premise. For instance in the case of southern Tehran the availability of suitable raw material is a major factor in their development; brick kilns for example use the local clay. Traditional industry because of its small scale of operation could be established close to the purchaser. The eastern part of the bazaar is a place where such traditional industries such as metal working have developed. On the other hand the modern industrial establishments, because of their demand for space, tend to ^{lie} ~~locate~~ on the city periphery, but particularly on the main roads leading to the provinces. In such locations not only is access to various parts of the country assured, but the cost of land is also very low, because of distance from the city centre. This low price permits owners of factories to establish factories on large plots of land, on which small factories have been built, and extra land is available for future expansion.

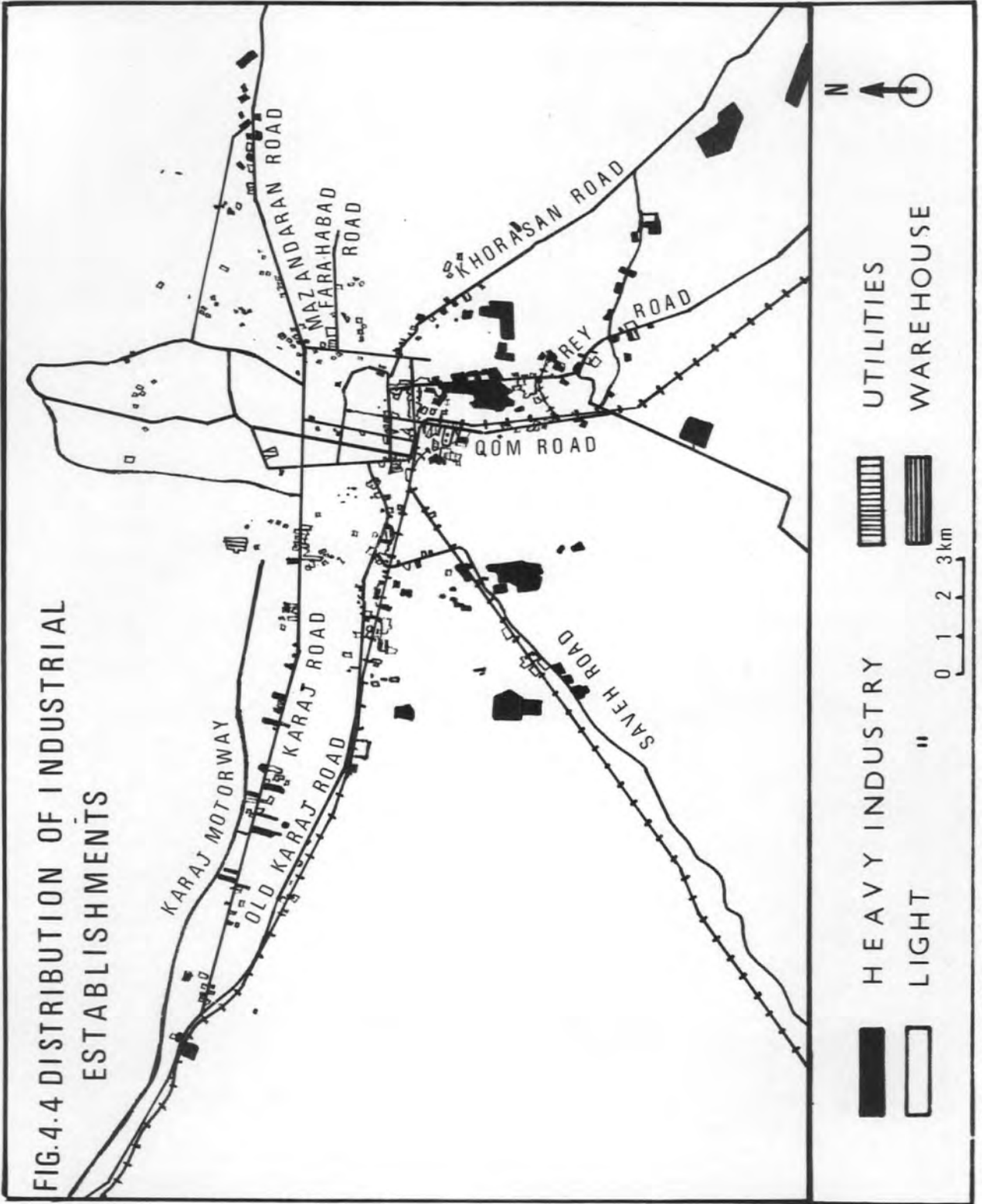
Recently the government has taken measures to transfer factories causing noise and pollution within the city to peripheral areas, and the issue of permits for new factories dictates the distance that a factory should be from the city. At present most of the factories inside the city are of the small type with less than ten employees. (According to the

industrial census held in 1963 97 per cent of the 30,940 manufacturing establishments in Tehran had less than ten employees and most of them were located in the central and southern parts of the city.

In studying the distribution of large factories in Tehran eight broad zones can be specified. These eight zones correspond with eight routes in the west, south, and east of the city, connecting Tehran with other parts of the country. It should be noted that apart from access to roads and transport facilities, factories producing construction materials attach great importance to their access to raw materials required for their operation, at a time when the growing population of Tehran guarantees a constant market for their products. The eight zones in question are shown on Fig. 4.4 they are Karaj, and Qazvin (Old Karaj) roads (west), Saveh road (south-west), Qom road (Aramgah) and Rey road (south), Khorasan road (south-east) Farahabad and Mazandaran roads (east). These zones can be divided into sub-districts. The most important and interesting point however is that the further out from the city boundary, the larger the factories and a change from non-basic to basic production. This order is such that at the beginning of most of these roads non-basic factories have developed. For instance a number of factories for construction material are located at the beginning of Karaj and Rey roads. Similarly the existence of soft drink, pasteurized dairy products and vegetable oil factories located at the city end of Karaj and Old Karaj roads.

(1) The Karaj Road - Several industrial activities have been established on both sides of this road along a distance of approximately 25 kilometres (see Fig. 4.4). These establishments are mainly modern and are the result of the development programmes in the past two decades, especially during the Third and Fourth Development Plans (1963-67 and 1968-72). Starting from Khiaban-e-Kennedy, towards the Maidan-e-Shahyad, construction materials, foodstuffs and non-alcoholic beverages occupy the first section. From Maidan-e-Shahyad, to the junction with the Old Karaj road there is an increasing concentration on basic products. Machine tools and metallurgical industries have been established together with some important chemical factories such as the Pars Refinery. The land price in this zone compared with the Central part of the city is much lower, these factories therefore are capable of expanding over a wide area without incurring tremendous costs. Factories such as Arj Metal Products, occupy large plots between the Karaj road and the Karaj motorway. One major handicap of this zone is great distance from the labour force of Tehran. This problem has been tackled by providing bus services bringing labourers from their houses in southern and central parts of the city to the factories. This zone appears therefore as an industrial zone with little working-class housing. The Chemical and Machine-tools factories, and 'Iran National' car assembly plant, located in this zone, not only supply Tehran with cars but produce for other parts of the country and also export to neighbouring countries.

FIG.4.4 DISTRIBUTION OF INDUSTRIAL ESTABLISHMENTS



SOURCES: 1- FARMAN FARMAIAN, 1966. 2- MINISTRY OF INTERIOR 1963.
3- FIELD WORK.

(2) Old Karaj Road (Qazvin road) - This road starts from Maidan-e-Qazvin and extends for about 25 kilometres until it joins the Karaj road (see Fig. 4.4). The most important industrial establishment on this road is the Tobacco Factory (Dokhaniat). In 1964 this was one of the 16 largest factories of Iran with a labour force of 3535.²⁹ Further from this factory is located the beverage factory of 'Canada Dry'. Nearby are metallurgy factories including 'Iran Aluminium Plant', and 'General Metal Goods Plant'. There is then an area mainly occupied by foodstuffs production, especially dairy products ('Tehran Dairy Pasteurized Products' and 'Pak Pasteurized Products'). There is also a large bakery and a sausage factory. Between this latter area and another more westerly area of food processing, lies a small area of metal production including the 'Rialco Factory'. The food processing area includes a fairly large biscuit factory ('Vitana') together with a collection of factories known as 'Behshahr Industrial Group factories', with vegetable oil as the main product. Some machinery and textile factories are among the industrial establishments on this road near its junction with new Karaj road. Old Karaj road is very intensively used by heavy lorries (see traffic section Chapter 5) and as such a great deal of congestion has ensued. This in turn has decreased the efficiency of the operation of factories along this road and favours re-location in more desirable areas. Compared with factories on the new Karaj road, where plots are generally larger, the size of factories on this road varies greatly and establishments are generally older.

At its eastern end, fairly close to the Railway Station and the Goods Yard, large warehouses have been built for the storage of various commodities. This part has a high density of low income population. Whilst this leads to great traffic congestion there is the advantage of access to a large labour force. The increasing cost of land together with congestion are factors which may necessitate the transfer of some of the establishments to the western end of this zone or even to the new Karaj road.

(3) Saveh Road - Along both sides of the Saveh road which branches south from the old Karaj road, five kilometres west of Maidan-e-Qazvin, running in a south west direction there are a large number of brick kilns and other establishments dealing with construction materials. There is also a metal-work plant and a Chemical factory (B.F. Goodrich). Apart from climatic disadvantages, especially the heat factor, access to major roads and large amounts of cheap land are the reasons for the encouragement of future expansion along this road. It is in fact this zone which has been considered as the major industrial zone for future development. However, the climatic disadvantages are important factors which must be taken into account by planners, especially when considering housing and living conditions for the future labour force in this area.

(4) Qom Road (Aramgah road) - The industrial development in the southern part of the city is older than that of any

other part of Tehran. This zone covers the whole industrial complex around the railway station, together with both sides of the Qom road, which runs in a southward direction, from Khiaban-e-Shoosh. Because of the proximity to the railway station most of the establishments in the northern part are devoted to warehouses, transport facilities and services. For instance to the north-west of the railway station is a very large oil storage unit, and to the north and north-east are heavy metal storage concerns, and an important cold storage unit. Other industries of this area are connected with metallurgy, packing, and foodstuffs. The very large cotton textile factory of Tehran with a large labour force (more than 2,250 in 1964) is also situated on the city end of the Qom road.³⁰ South of the railway station are some large storage areas for grain (Silo-e-Tehran) and tobacco. The remaining part of the road south to Rey is bounded mainly by brick kilns. Also within this zone are important working-class residential areas, such as Naziabad and Kuy-e-Nohom-e-Aban. Industry is thus assured of a plentiful supply of cheap labour which does not have to be transported great distances as in zone 1. South of Rey is the location of the Tehran Refinery which is the second most important refinery in Iran after it came into operation in 1968. Because of its highly mechanized nature this factory does not provide important employment opportunities but its effects on the surrounding areas are reflected in such things as paved roads and electrification. Because of its ~~operation~~ the possibilities for future development in the

area are great.

(5) Rey Road - This road has been developed parallel to the Qom road and runs from Maidan-e-Shoosh. Near Maidan-e-Shoosh large garages have been set up as a result of proximity to large fruit and vegetable markets. Naturally the density of population and heavy traffic, have turned it into one of the most congested areas of Tehran, with all the associated planning problems. Almost one kilometre south of Maidan-e-Shoosh, the old sites of brick kilns extend southward on either side of the road for about two kilometres. Further south there is an inter-mixture of large industrial premises, including shoe, vegetable oil, and soap manufacturing factories. To the south of this are two distinctive industrial areas. Firstly there is a group of three textile factories whose goods are mostly absorbed by the Tehran market. Very close to this area on the eastern side of the road, are two major factories, one devoted to cement production ('Siman-e-Rey'), and the other to glycerine production. Both of these factories have been connected by a branch line to the main Tehran-Qom railway line for the distribution of their products. To the north of Shahr-e-Rey the road by-passes the town and runs in an easterly direction towards Varamin, with some chemical plants and construction material establishments three kilometres due east of Rey. In addition there is another cement factory and numerous brick kilns built on the clay fields. Although there is access to a large labour force at Naziabad to the north, the population density decreases

as the climate becomes more unsuitable for the establishment of adequate housing. That is why labourers engaged in the factories of this area are often transported by special bus services from their homes elsewhere in the city. Recently the government decided to move all the brick kilns and concentrate them in an area south-east of Rey, where they are not only away from major population centres, but also in such a position as to avoid polluting the city with their smoke.

(6) Khorasan Road - This road runs south-eastwards from Maidan-e-Khorasan and connects Tehran with the nearby agricultural areas of Varamin and Eynankay. These areas provide a large proportion of the fruit and vegetables of the capital by heavy lorry. Consequently some of the biggest garage, service and repair stations have been located on this road, and all this has naturally and unavoidably made the roads very congested and overcrowded.

(7) Farahabad Road - This road is situated to the east of Tehran. Next to Maidan-e-Jaleh, where the road begins is located the power station of Tehran, one of Iran's main utilities, employing a labour force of 1,988 in 1964. The other factories on this road are the 'Darougar' chemical and pharmaceutical plant, and a munitions factory belonging to the government and supplying the Imperial Army. (Since this factory is surrounded by residential quarters, and obviously a security risk, it would seem wise and appropriate to move it to a new location as soon as possible outside Tehran's boundary. Moving eastward along this road one

comes across other factories mainly involved in the production of foodstuffs and metal products. The existence of such factories is useful in the provision of job opportunities for the low-income inhabitants of Farahabad district.

The eastward extension of the road is limited by a mountainous area associated with a royal hunting ground, and extends no further than the dry river bed of Sorkh-e-Phesar. In comparison with other roads mentioned above, this is the only road which is not a thoroughfare out of the city, and as such development may be inhibited. However this disadvantage may be outweighed by the lower price of land in this area compared with the new Karaj road. Recent interest in the re-development of the palace of Farahabad at the eastern end of this road may prove an incentive to further investment in the area. Industrial establishments benefit from a large source of labour in Tehran Now and Narmak, and because of their proximity to the city are provided with public utilities such as water and electricity, unlike many other large establishments in the city who are obliged to provide their own utilities. Between the Farahabad road and the Mazandaran road lies the important military airport of Dooshantapeh with its associated service establishments.

(8) Mazandaran Road - This road branches out eastwards from Maidan-e-Shahnaz, parallel with the Farahabad road and runs through one of the most densely populated and low income districts of Tehran. Since this road constitutes one of the

capital's main outlets to the east and north of the country, it has a series of garages, auto service and repair shops, and numerous car and bus terminals extending for about two kilometres eastwards from Maidan-e-Shahnaz. Beyond these, about six kilometres east of Maidan-e-Shahnaz are located several factories engaged in metallurgy (for example 'Arj'), and machine tools (for example 'Machinsazi-e-Tehran'), and several which produce construction materials, and provide jobs for the labourers and low income inhabitants of Tehran-e-Now and Narmak. Further eastwards many factories engaged in metallurgy (e.g. 'Khorram' and 'Azemayesh'), textiles and chemicals are to be found, together with a factory ('Phillips') producing electrical and tele-communications equipment. They are located in favourable positions from the point of view of wind direction, in that their polluting effects are not felt by Tehran. If the large plots of land allocated to the north of this area for military purposes had not been an obstacle, this area could have been turned into an ideal location for the future expansion of Tehran's industrial activities.

By studying the nature of the distribution of the industrial districts, it can be concluded that the principle industrial zones are located away from the residential quarters of the high income inhabitants and no major industrial activity is to be found in the north. In the main these principle industrial zones have been set up since 1960 and the new industries such as metallurgy and chemicals, are the result of increased investment in, and special attention paid to industrialization in the country.

The increase of investment by the private sector, especially during the Third Development Plan (1963-1967), has been a major factor in the expansion of industrial activity in these areas. These factories are either newly established or transferred from the inner parts of the city and erected on larger plots of land in cheaper areas.

By studying the distribution of the industrial zones in relation to their respective products, certain conclusions may be reached.

Industries aimed at the production of foodstuffs and construction materials whose products are mainly consumed by the population of Tehran, comprise, as a whole the non-basic industries, and because of local consumption, their factories are located, as far as possible, within easy reach of the city. Because of their non-basic nature they are also mainly located on less important roads such as the Rey and Old Karaj roads.

The basic industries of recent establishment such as machine, and machine-tools, have a market which is not purely local. Their products are taken to other parts of the country, and even exported to neighbouring countries. Such industries tend therefore to be located on the more important roads, such as the Karaj and Mazandaran roads. They are also located at a greater distance from the city, as the quantity and quality of their products necessitates their access to larger plots of land, which must at the same time be reasonably cheap. For example 'Iran National Automobile Plant' is 25 kilometres from Maidan-e-24th Esfand on the Karaj road and the 'Philips' telephone factory is 15

kilometres east of Maidan-e-Shahnaz on the Mazandaran road.

Another conclusion from these studies is the potential importance of the direction of winds in determining sites for location of industries. As already mentioned in the chapter dealing with Physical Geography of Tehran, the winds blow mainly from west to east; a reason for establishing factories in the east to save the city from their polluting effects. This factor has not been fully considered in the past. Taking into consideration the availability of an abundant and cheap labour force in the suburban areas of Narmak and Tehran Now, it would be even more desirable for industry to expand in the east. If, however, the industrial investment policy, still requires that land on both sides of the Karaj road be utilized for new industrial establishments, then the question of access to a labour force must be given due consideration. Erecting new and reasonable labour quarters in sufficient numbers between the old Karaj road and the new Karaj road would appear to be a possible solution.

In dealing with the general expansion of industry in Tehran and its environs, the over-riding importance of water supply must not be forgotten. Shortages of water are acute, and severely limit further development. Because of this and for economic reasons government policy is geared to the de-centralization of industry and the establishment of growth poles in provincial cities such as Tabriz, Arak, Esfahan and Ahvaz. New industry in theory is not allowed to develop within 120 kilometres of Tehran although in practice it is possible for companies to "by pass" government Legislation.

C. Residential Areas:

As we have already seen, at the outbreak of the Second World War, Tehran had expanded without any serious difficulties and had managed to absorb its population growth.³¹ There had never been a period of acute shortage of housing. Because the spatial extent of the growth was small all parts of the city were relatively close to each other. The limited number of vehicles, little population congestion and the existence of social and trade guilds, all served as a control against the spreading of the city's various functions including residential quarters. Consequently all the inhabitants of the city lived within the physical limits of the city.

After the war however, a rapid increase of the population caused a shortage of housing and resulted in the outward expansion of residential areas. By the early 1950's, the trend was even more pronounced and reflected the still growing housing demand. Speculative land owners built many houses with little consideration of space requirements, lighting, ventilation, drainage or access for public cleansing. Municipal regulations were ineffective, and uncontrolled and irregular buildings spread, especially to the west. At the same time, the chaos and congestion in central residential areas, urged many more Tehranis to move out and settle in other parts of the city particularly to the north of the capital. Following this, gardens and vacant areas were built over with new houses usually of two storeys. In the northern part of the city especially along roads leading to Shemiran

and further to the north between Qulhak and Tajrish the new houses built were mainly large villas with gardens constructed by individual wealthy Tehranis. The eastern and western part of the city became dominat^uely occupied by lower middle class professionals and businessmen. The western part was occupied mainly by Azarbaijani migrants, whilst towards the south, the expansion of single storey buildings was a result of the concentration of low class people and especially new in-migrants. During the 1960's an increase in vehicles and the extension of bus services played an important part in encouraging further movement to the suburbs.

a. Form and type of housing:

When studying the form and type of housing and its distribution pattern in Tehran, many interrelated factors such as physical, economic and social ones must be taken into consideration. Physically important is the fact that Tehran is severely restricted by mountains and high hills both to the north and, to a lesser extent, to the east. On the south, it is the proximity of the desert that imposes limitations. Therefore, extension of housing facilities in these directions is either physically or economically impractical. At the same time, these topographical factors have caused climatic differences from north to south and consequently have affected the distribution of housing quarters. For instance, the wealthy inhabitants of Tehran prefer to reside in the northern part of the city in order to enjoy a better climate. This preference is one of the reasons why Shemiran has become a first class

residential area of Tehran.

The second determining factor, is economic, and three broad but distinctive residential areas based on the income of residents are discernable. Firstly, the northern area including Shemiran and extending southward to Abbasabad. This area is mostly occupied by the high income families who usually have their own private cars. Excellent climate and the relatively inexpensive land in this area have counteracted a detraction factor, that is, distance from the city centre. The price of land has also allowed owners to build their houses on large plots of land, in most cases, with areas of more than 300 square metres, in the form of villas and two storey houses often surrounded by large gardens. In order to provide the house with good ventilation and direct sunlight, traditional orientation of houses (i.e. in a south-north direction) is favoured. As far as the date of construction is concerned, the houses in this area, form one of the most modern residential districts of Tehran and nearly all of them have been built since 1950, that is from the time of the movement of wealthy families from the central areas. Since large sums of money have been used in their construction, and personal taste has influenced their design there now exist a large but mixed collection of houses representing both Iranian and European architecture with a variety of plans, colours and designs. These houses are almost all privately owned and usually inhabited as family units with 4 or 5 persons. They are normally equipped with the most modern facilities, have at least four rooms and most of them a garage or parking lot. In this area the housing estate of Saheb Qaranleyeh, built in the early 1960's

with capital from the Bank-e-Sakhtemani and from abroad is the most distinctive and luxurious residential area of Tehran with a townscape different from any other part of the city. This is the best high class residential area being located to the east of one of the Shah's palaces at Niavaran in the extreme north of the suburb of that name. It is provided with a local shopping centre and a park and is secluded from surrounding areas. The building density is low per hectare and house values and rentals are very high because of the climatic conditions and social values attached to this area. The tenants therefore are either very wealthy educated Tehranis or foreigners (especially Americans) who are temporary residents in Tehran. The houses in this estate are in a form of detached villas and all have small front gardens with fountains. In general, the large gardens and cultivated lands surrounding the houses together with the many vacant plots of land have led to a very low density of population.

The second major residential area is situated between Abbasabad and Khiaban-e-Shahreza and is occupied mainly by middle-income families. This area is just to the north of the Central Area and has a relatively high social status. All these factors have resulted in raising the price of land and this accounts for why the buildings in this area are being built upward in the form of 2 to 5 storey blocks or even higher. Here therefore there is a close relationship between the physical shape of buildings and the price of land. The further one goes from the north to the south in this area (that is from Abbasabad to Khiaban-e-Shahreza) the

higher the buildings and thus the highest apartment buildings are to be found between Khiaban-e-Shahreza and Khiaban-e-Takht-e-Jamshid. The buildings in this area can be divided into two main groups as far as appearance and date of construction is concerned. The first group consists of older blocks of two to five storeys. The most typical block of this group can be found along Khiaban-e-Shahreza. These blocks of 4 to 5 storeys with shops on the ground floor, are representative of the pre-war architecture of the period of Reza Shah (1925-41). They usually have a small back yard and nearly all of them lack a garage. Although they are still used as residential flats, they are gradually being turned into business and office quarters owing to expansion of trade and business in the northern part of the city. This trend can be seen along Khiaban-e-Shahreza between Khiaban-e-Roosevelt and Pahlavi Crossroads.

The newer housing quarters in this area are situated between Khiaban-e-Takht-e-Jamshid and Abbasabad. As one moves northwards the building blocks are less high and of more recent construction. At Abbasabad, nearly all the buildings have been erected during the construction boom of the 1960's. These houses, built by the private sector for sale or rent, have in many cases a common dividing wall, as an economy measure. They are also very monotonous in design and external appearance. These houses are built on plots of land with an average area of 200 square metres and extend to a maximum of 300 square metres. They usually have a small front or back yard and are surrounded by relatively

low walls. Although they look quite modern with some evidence of European design, they are, nevertheless, quite inferior to houses built in Shemiran in the quality of their construction. Such houses, mushroomed in Tehran during the 1960's, and are also to be found in increasing numbers in the east and west of the city. The relatively high price of land as well as social prestige distinguishes this part of the city and that is why the eastern and western parts of this middle area, though climatically not different from the middle portion, are cheaper in price because of distance from the Central Area. Therefore these two parts, namely the east and west of the middle area are now being occupied by middle class migrants from provinces. This large number of immigrant population from other provinces has made many private investors sink large sums of money in the construction business. The private sector therefore has been very active in this field and housing now extends to Tehran Pars on the east and Kan in the west. It is interesting to note that during the 1960's, no less than ten small suburbs have emerged in the north west of Tehran between Maidan-e-24th Esfand Square and Kan village along Khiaban-e-Taj. These suburbs comprise residential quarters now fully developed.

The third important residential area of Tehran starts from south of Khiaban-e-Shahreza or more precisely from south of Khiaban-e-Sepah and stretches southward as far as Rey. This area is occupied predominantly by the low income inhabitants of Tehran. These people usually do not have

TABLE 4.6:

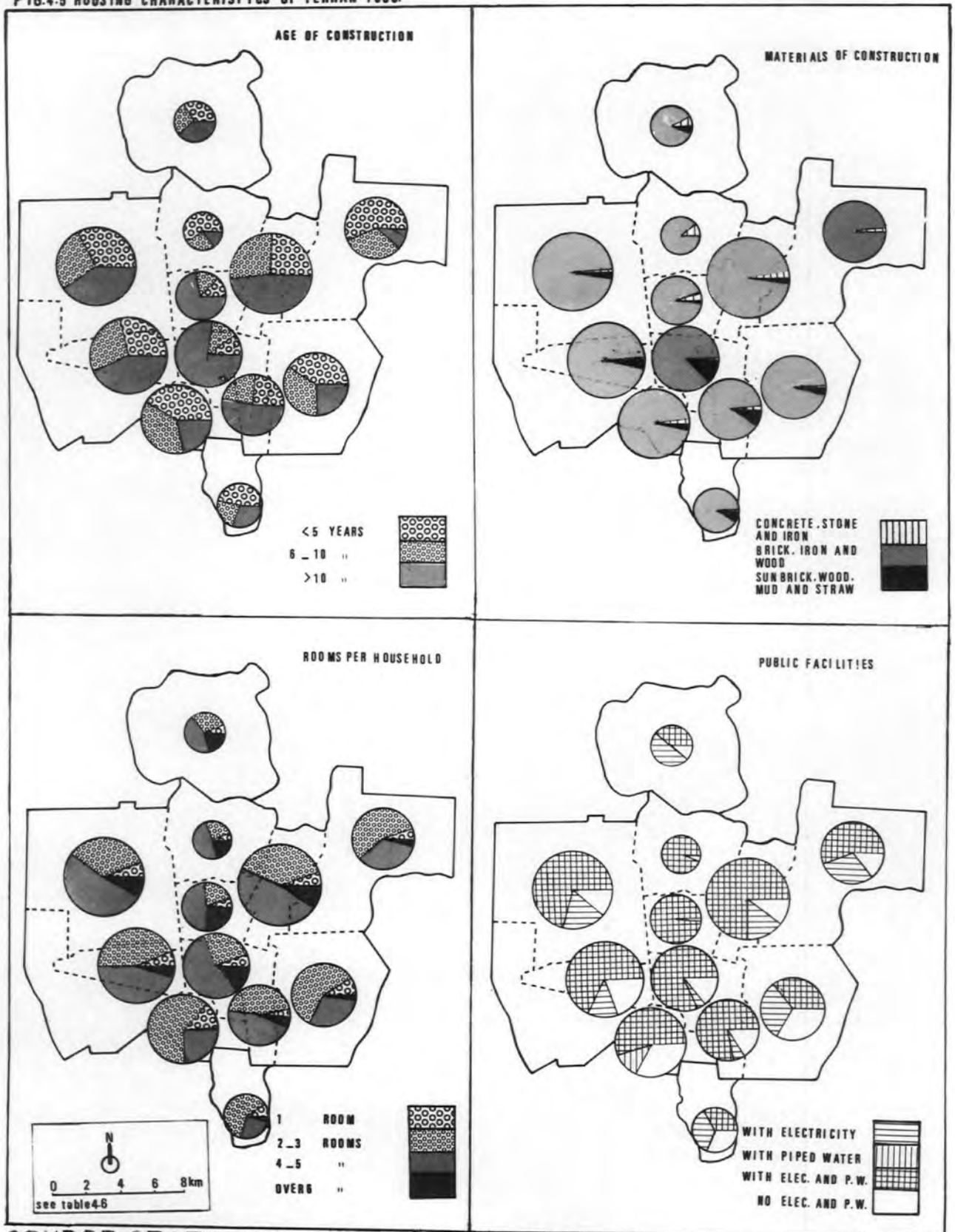
Housing Characteristics for districts of Tehran, 1966

District	Housing Units	Housing by age %						Röoms per household %				Housing construction materials				% Housing by Pub. Utilities Piped water %
		5 yrs	5-10 yrs	+ 10 yrs	1	2-3	4-6	+6	stone & iron	Concrete, Brick	Sunbrick	Iron, wood, mud,	Electricity	88.6		
1	42,202	33.3	27.1	39.6	5.5	34.3	51.3	8.9	1.4	95.8	2.8	2.1	98.4	88.6	71.2	
2	26,716	13.6	15.1	71.3	6.0	20.5	46.3	27.2	4.4	93.5	2.1	2.1	98.4	88.6	97.8	
3	44,979	25.0	27.5	47.5	5.4	38.0	47.3	9.3	2.5	95.1	2.4	2.4	89.6	88.6	74.6	
4	41,843	29.3	28.0	42.7	6.7	43.2	45.4	4.7	1.2	94.8	4.0	4.0	80.3	88.6	67.3	
5	35,891	10.6	13.1	76.3	6.3	25.4	53.8	14.5	0.5	86.5	13.0	13.0	85.1	88.6	81.0	
6	35,178	41.2	34.3	24.5	8.9	58.8	30.0	2.3	0.3	95.6	4.1	4.1	67.0	88.6	35.3	
7	38,011	42.2	37.2	20.6	13.5	61.4	23.5	1.6	2.4	94.7	2.9	2.9	60.1	88.6	66.5	
8	33,951	57.7	32.0	10.3	6.1	55.7	34.6	3.6	2.2	97.8	0.0	0.0	86.2	88.6	56.1	
9	20,276	60.7	24.3	15.0	6.3	24.7	48.2	20.7	11.0	88.0	1.0	1.0	94.5	88.6	90.6	
10	34,049	24.2	22.7	53.1	3.6	44.1	45.8	6.5	1.8	88.7	9.5	9.5	83.1	88.6	77.7	
Tehran	354,246	32.7	26.8	40.5	6.8	40.6	42.6	9.4	2.7	9.3	4.1	4.1	82.6	88.6	70.5	
Shemiran	22,289	33.7	27.9	38.4	6.6	30.2	41.9	21.3	7.1	84.9	8.0	8.0	88.1	88.6	39.4	
Rey	23,719	46.8	24.0	29.2	9.8	61.7	25.3	3.2	0.5	90.6	8.9	8.9	69.3	88.6	33.5	

Sources: National Census of Population and Housing. 1966, Vol. 10, Vol. 13, Vol. 3.

private transportation so prefer to live as near as possible to their place of occupation in order to reduce transport costs and pay less rent in this densely populated area. The houses in this area are almost all of one storey and this is because of their date of construction or because of building techniques and the materials used (Fig. 4.5). As a general rule with the significant exception of the suburbs of Javadiyeh and Naziabad, the oldest dwelling places of Tehran are to be found in this area and particularly around the bazaar district. These houses could also be classified into two broad groups: Firstly large houses containing several rooms originally built by wealthy people and tradesmen around the Bazaar. A few of these large houses are still owned and inhabited by rich owners but the majority are at present being used by low income families and usually three or more families live in one house (for number of rooms per household see Fig. 4.5). This change of occupancy to families with low incomes is a continuing trend. In fact, the residential areas in the old city represented by District 5 can be considered in the hypothesis of Burgess's Concentric zone as the district in transition.³² The second group of houses in this area are those built to the south of the bazaar and extend to Rey. Here in District 6 and 7, there are high densities despite an absence of tall apartment buildings. The bulk of population are in houses with 2 to 3 rooms, built on a plot of land between 60 to 100 square metres in area. A high proportion of the housing units have only one room or at the most 2-3 rooms showing the degree of population

FIG.4.5 HOUSING CHARACTERISTICS OF TEHRAN 1966.



SOURCE: STATISTICAL CENTRE OF IRAN.

density in this area. (Fig. 4.5 and Table 4.6).

Inhabitants of these houses are that section of the Tehran population which earn the lowest income. Due to lack of open spaces in this area, population density is very high reaching more than 700 persons per hectare and the residential area between the bazaar and Khiaban-e-Shoosh, to the south and south-west of the railway station, has one of the highest densities in the whole city. The great number of two or three roomed houses with small pit-like yards are a dominant feature. Here the light industry including household industry produces a highly mixed texture. The influx of low income migrants from the provinces to live in the southern parts of this area is the main reason for the ever-increasing population density and the acute housing shortage.

In comparison with the physical and economic considerations, social factors have a smaller role in determining distribution and conditions of residential areas in Tehran although at times it is difficult to isolate them as separate variables. Nevertheless one may note that some of the noble and wealthiest families of Tehran still live in the old southern districts such as on Khiaban-e-Rey and Khiaban-e-Shahpur merely because their traditional attachments and local popularity would not let them leave the district. As mentioned in chapter 2 the 19th century residential pattern within the pre-industrial city of Tehran were very different from today. The houses of noble-men formed centres of spheres of influence. Present settlement shows residual elements of this formerly important

pattern. To cite another case showing the importance of the social factor, the district of Tehran Pars which is one of the modern residential quarters erected in the east of Tehran, has lost much of its popularity, mainly because it is situated out with a district inhabited by low income people and access to it is through the very congested area around Maiden-e-Shahnaz.

Having now looked at the broad contrasts between different housing areas of Tehran it is necessary to stress that the private and public sectors, are both important in house building in Tehran. The increase of population in Tehran after the end of the Second World War, resulted in an acute housing shortage. This acted as an incentive to the private sector to invest in real estate and when this proved to be lucrative it was encouraged. The pace of investment became very rapid. Before 1951, due to the lack of control by the government and because of no planning and development laws, large plots of land around Tehran and particularly in the north and the north west were bought by a few speculators (see Chapter 6 p.210). These plots of land were divided into smaller plots and some of these sub-divisions were used for housing blocks. The low price of these houses because of the use of cheap building materials, placed them within the easy reach of many people with a low to middle income. During the 1950's and the start of the 1960's, besides the local population increase, the assignment of a large number of American experts and advisers to Iran, who were ready to pay high rents for better

accommodation, served as a major factor in encouraging the private sector to invest even more in housing. As a result of this new demand, that is the willingness to pay a higher rent for better houses, many apartment houses and villas were built between Khiaban-e-Takht-e-Jamshid and Abbasabad and Shemiran. Would be tenants with their offers of high rents caused a rapid and uncontrollable rise in the rent of houses in Tehran. This escalating trend has remained ever since. According to a survey carried out by the Plan Organization, there were nearly 20,000 vacant, well-equipped houses or apartment blocks in Tehran with owners preferring to keep them vacant rather than lower their rent. At the same time, the numbers of housing units needed for low income families was approximately 80,000.³³

As a result of the activities of the private sector during the 1960's, numerous residential districts were built in or around Tehran such as Shahr Ara, Tehran Villa, Daryani Now in the north-west, some parts of Abbasabad in the north and in parts of Farahabad to the east of Tehran. The lack of sufficient individual funds in the private sector, and of acquaintance with the principles and correct methods of city planning, as well as profiteering on the part of many people engaged in housing activities, are among the factors responsible for the very irregular and unsatisfactory distribution of residential districts in Tehran. According to Paul Vieille, in 1960, Tehran had sufficient land for accommodating up to 6 million inhabitants by 1975.³⁴ In his estimation therefore, the rapid sprawl and associated problems were unnecessary. But lack of any

control on distribution of residential districts and the low price of land around Tehran resulted in an almost random spread of housing districts around the city in an unplanned and irrational manner causing many difficulties in supplying city services to these houses.

One exception to this, might be the district of Tehran Pars established by some Zoroastrians who invested in land to the east of Tehran in order to create a small suburb based on sound planning principles. This district was started in the mid 1950's and completed by 1960. The result was a complex of a large number of medium sized villas built to a high standard. But even in this case, one major shortcoming has helped defeat the purpose of the scheme as a well integrated suburb. This was the lack of a suitable shopping centre which turned Tehran Pars into a mere residential satellite dependent on Tehran for many of its requirements.

Since real estate requires a large amount of investment and the private sector in Tehran has a big share of this finance, (up to 70%), it would be advisable that the activities of this sector be more controlled and directed by the government through proper and well-planned channels. It is only by such control and direction that better results could be achieved for relieving the acute housing shortage in Tehran.

Allocation of sufficient funds for the implementation of various projects based on sound planning principles have helped to place the activities of the public sector in a better position than those of private developers. One of

the earliest projects implemented by the public sector was the creation between 1946-49 of a residential district of 400 housing units to the east of Tehran, financed by the Mortgage Bank. The district has been named "400 Dastgah" or four hundred housing units and is located in the east of the city. In 1950, another project was started and one storey houses with 4 to 5 rooms in the area south of Mazandaran road to the east of Dooshantapeh Airport called Tehran Now was built. Both of these projects were essentially low price housing and almost all of the two housing schemes are now occupied by lower middle class families. In 1951, after the law of land registration came into force, large plots of land around Tehran came into the possession of government as public property. At the same time the Construction Bank (Bank-e-Sakhtemani) was founded charged with the responsibility of housing construction in Iran. As a first step, this bank allocated, 17,000 small plots of land around Tehran for housing purposes and various housing projects were implemented such as Narmak in the east, Naziabad in the south and Kuy-e-Kan in the west of Tehran.

Building operations for the housing project of Kuy-e-Narmak (in District 8) started in 1956 on a large plot of land covering 600 hectares on the Mazandaran Road, to the east of Tehran 4 kilometres from Maidan-e-Shahnaz and north of Tehran Now. On this large area, 8,000 plots of land between 200 and 500 square metres in area were laid out and on most of these one-storeyed villas with small gardens

were eventually built. This residential district has been divided into 19 sections, each with open spaces and equipped with power supply and well water. About a third of this area, that is 200 hectares has been allocated for administrative buildings and services as well as main and branch roads connecting sections of the area with one another. In 1961, the population of this residential district was almost 70,000, while in 1966, it exceeded 90,000.³⁵ Residents of this district are middle income and lower middle income families. As a result of the vicinity of Maidan-e-Shahnaz which is an important shopping centre, most of the wholesale and retail transactions are made there and the only business and shopping facilities in the district, are in the form of scattered small retailers. Because of the relatively high population of this district there is now a need for a planned shopping centre to serve local needs.

Kuy-e-Naziabad (in District 7) is situated to the south west of Tehran between the railway station and the military airport of Qalemorghi, and covers an area of nearly 300 hectares. As the first step in housing construction, about 2,800 building plots of 200 to 600 square metres were allocated and used for building houses for low income families. This district enjoys city services such as water and power and as a result of being in the proximity of the railway station, textile factories and Tehran's Slaughter house, and other job opportunities, has a high density of population which is still increasing. In 1961,

the population of the district and surrounding area was approximately 30,000. This figure had reached 63,500 by 1966 or more than doubled in 5 years.³⁶ The inflow of immigrants from the provinces may increase this figure still further.

Kuy-e-Kan (in District 1) situated 15 kilometres west of Tehran was established in 1960. It comprises several four-storeyed blocks of buildings each containing 30, three or four-room flats and designed for government employees. Thus, it is very different from the other housing projects of Tehran. All flats are planned so that they obtain sufficient sun light. Open spaces have been provided on the north and on the south and public buildings and shopping centres are situated to the north of the residential blocks. Each block has also been provided with a parking lot. Although this form of housing is not very acceptable to the average Iranian it does house many people in a relatively small space, and it may well be necessary to further develop this type of housing for it could solve some of the housing shortages for low income families in the centre and south of the city. The residential blocks of Kuy-e-Kan are mostly occupied by middle income families the majority being government employees.

In the middle of the 1960's, the government played a rôle in implementing an inexpensive housing project at Kuy-e-Nohom-e-Aban to the south of Tehran on the Qom Road (Aramgah Road) 6 kilometres south of the Railway Station. Houses of this district are all of one-storey with each unit having a small yard. In the midst of this

district, a large park has been provided with shops and public service units. The creation of this new district has served as a guideline to counteract the development of shanty towns both inside and outside the city. It was after this district was built that many of the residents of a shanty town, north east of Maidan-e-Valiahd together with the slum and cave dwellers from the brick-kilns of southern Tehran were moved here and given the opportunity to live in good dwellings. The cost of these houses is low and many occupants are purchasing them by long-term instalment.

Nowadays, there are various sources which provide financial facilities for housing projects, including banks which give credit at a reasonable rate of interest. Among the banks one could mention the Mortgage Bank (Bank-e-Rahni) in the public sector and the Export Bank (Bank-e-Saderat) in the private sector and both of them provide their clients with housing credit at 8 to 12 per cent interest. At the same time government employees with some years of service, can enjoy similar credits for housing. Since 1964, that is after the Ministry of Development and Housing was established, all housing activities of the public sector were placed under its supervision and administration. One of the recent actions of this Ministry through its Housing Organization, was the implementation of three housing projects in Khiaban-e-Forsat, (west of Maidan-e-24th Esfand) Behjatabad, (the site of a former shanty town) and Park-e-Sae on Pahlavi Road opposite Yoosefabad. So far, the first part of this project,

that is, four-storeyed apartment buildings in Khiaban-e-Forsat have been completed. Although the flats in these buildings are of a high quality, their high rent keeps them out of the reach of those in greatest need i.e. low income families. In fact only upper middle income families can afford them. Since the majority of the inhabitants of Tehran still comprise low income families, it is necessary that inexpensive housing quarters be constructed in the central and southern parts of Tehran. Such a policy would considerably help to reduce the population density in these areas and would help the inhabitants to enjoy better living conditions in new housing quarters equipped with modern facilities and built on sound planning principles.

In conclusion, the construction of multi-storeyed flats particularly for low and lower middle class groups is required to relieve the increasing problem of city housing. However, such needs have to be considered from both a financial and social view point. Because of conservatism and traditional mentality, high multi-storey residences are bound to be unpopular and the high rent which would have to be charged because of site factors and the high cost of building would bar low income groups from renting them. The upper income groups, on the other hand, do not like high rise residential apartments, because large houses with a garden in Shemiran are what they aspire to.

D - Social Services and Public Utilities

I Social services

1. Educational establishments

In developing countries a high proportion of the population aged under 15 is a common feature, presenting many difficulties of which educational expansion is one of the most immediate. It is not surprising therefore that in Iran the educational budget forms a large proportion of the expenditure. For example in the Fourth Development Plan (1968-72) 7.3% of Iran's total national budget was allocated to education.³⁷ In the academic year 1966-67 the total number of students in Tehran was more than 650,000.³⁸ Of this number 68% were studying in primary schools, 26% in secondary schools, and 6% in higher educational institutions. Such a high number of students, which is more than 22% of the total population of Tehran, indicates the overcentralization of education in Tehran. This will be more apparent when it is realised that whereas Tehran contains 11.5% of the country's total population, there are more than 24% of all Iranian students in Tehran. This factor confirms the need for further educational facilities in other parts of the country. In the academic year 1966-67 there were 108 kindergartens in Tehran, 396 secondary schools, and 31 advanced colleges, and 3 universities.³⁹ Excluding institutions of higher education, other establishments in Tehran are operated chiefly by the General Department of "Training and Education" of Ostan-e-Markazi (Central Province) which divides Tehran into educational districts together

with Shemiran and Rey. These districts have been allocated on the criteria of the number and density of population, local characteristics and family income. Unfortunately the boundaries differ from those of the 1966 census districts which makes comparison difficult (See Fig. 4.6). In recent years, the increase in the number of school-age children has exceeded the number of places in educational establishments; so much so that it has resulted in an increasing number of educational establishments being operated by the private sector. Although in 1966-67, 77.7% of the primary schools in Tehran were operated by the public sector and only 23.3% by the private sector, it is to be expected that private sector institutions will expand. (Table 4.7) In the public schools there are on average 37 students per class and 34 per teacher, whereas the corresponding ratios in the private sector are 28 and 21. Furthermore 80% of the public schools in Tehran operate two shifts, while there are only 6% of the private schools which have adopted this practice.

TABLE 4.7:

Public and Private Primary Schools 1962/3 & 1965/6

Sector	No. of Schools				No. of Students			
	1962-63	%	1965-66	%	1962-63	%	1965-66	%
Public	516	58.4	590	54.2	282,542	78.6	349,895	77.7
Private	368	41.6	499	45.8	76,929	21.4	100,689	22.3
Total	884	100	1089	100	359,471	100	450,584	100

Source: Ministry of Training and Education, Statistical Section Annual Report Tehran, 1967.

TABLE 4.8: Secondary Schools in districts of Tehran 1966-67

District	Public		Private			Public/ Private	
	Boys	Girls	Boys	Girls	Mixed	Boys	Girls
1	3	5	22	16	-	1	1
2	5	6	12	10	1	-	2
3	7	4	25	17	-	1	2
4	8	6	23	8	-	-	2
5	11	15	12	4	-	-	-
6	8	2	11	3	-	-	-
7	5	3	2	1	-	-	-
8	5	8	14	9	1	-	1
9	6	6	7	3	1	-	1
10	5	2	10	5	-	-	-
Tehran	63	57	148	76	3	2	9
Shemiran	-	-	9	11	8	12	8
Rey	4	3	2	1	-	-	-

Source: Ministry of Training and Education, Statistical Section Annual Report. Tehran, 1967.

Although elementary education is compulsory and free of cost, the above mentioned factors strengthen this trend towards private rather than public schools. (Table 4.8)

In the case of kindergartens, the majority are in the private sector, and in fact most of the 108 located in the north of Tehran, have been established by this sector. During 1966-67, out of 416 secondary schools in Tehran there were 127 public, 258 private, and 31 semi-private. (Table 4.8) This later category is defined as privately run but state

supported resulting in reduced fees.

Vocational institutions and technical schools form a very small proportion of Tehran's educational establishments largely because of the cultural and religious background which until recently did not favour technical education together with the greater operating costs that saw these schools chiefly operated by the public sector although there are a few vocational schools which are now supported by charitable organizations or benefactors. In 1966, of the national total of 82 universities and higher education institutions 3 universities and 31 advanced colleges were located in Tehran. The University of Tehran alone has 14,220 students, or 39% of the total number of students in higher education. Table 4.9 gives a clear picture of Tehran in comparison with the rest of the country.

TABLE 4.9:

Type of educational establishments in Tehran and the rest of the country (1966-67)

Different Educational Establishments	Tehran %	Rest of Iran %
Kindergartens	44.0	56.0
Primary Schools	20.7	79.3
Secondary Schools	32.7	67.3
Vocational Schools	37.8	62.2
Universities and Advanced Colleges	74.8	25.2

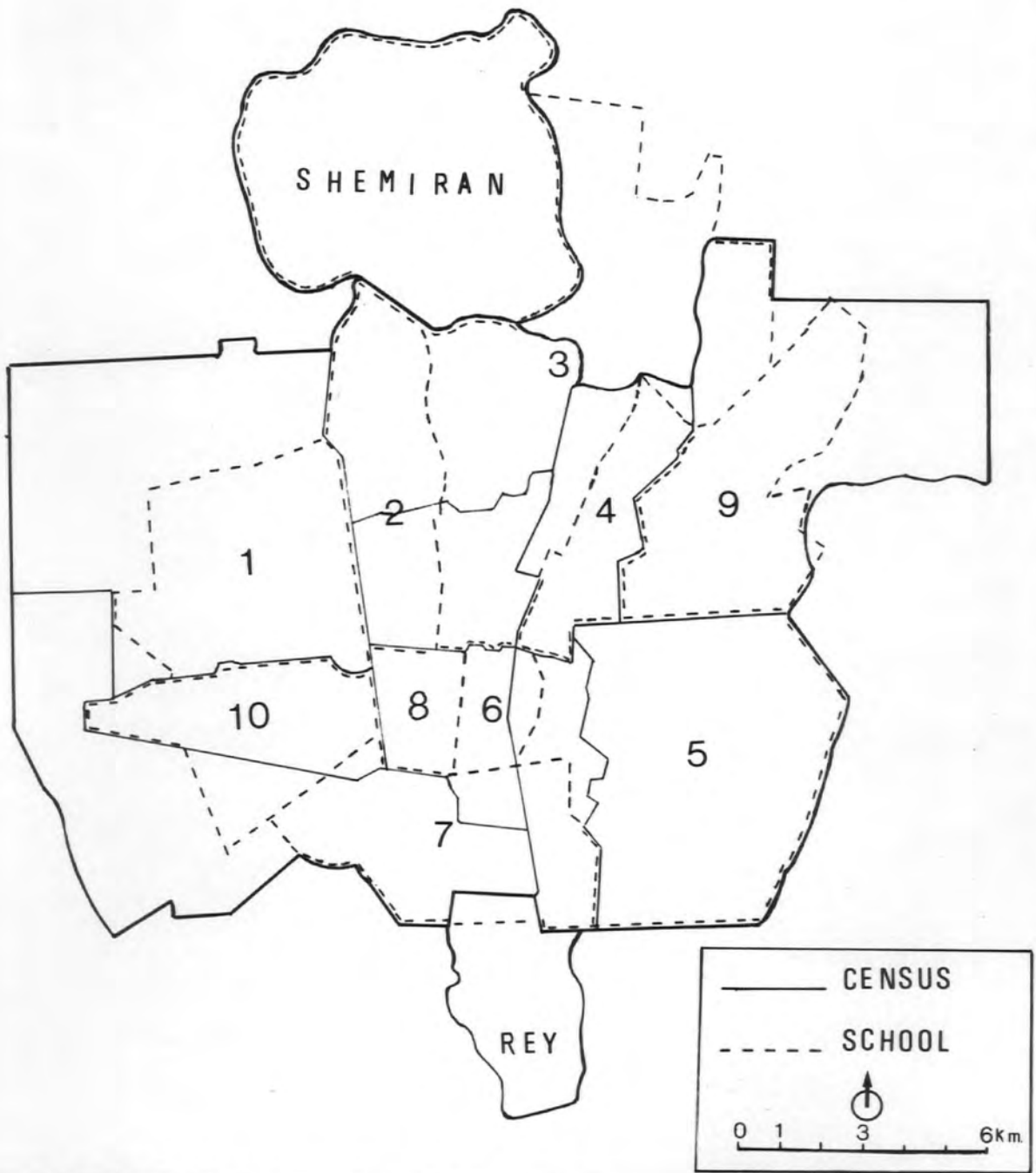
Source: Atlas of Tehran, Institute for Social Studies and Research, University of Tehran, 1969.

The last item in the table indicates that three out of four students in higher education study in Tehran. From a socio-economic point of view, the distribution of educational

establishments in Tehran shows many interesting contrasts. For instance out of 200 mixed primary schools only 15 were located in the southern educational districts and none in districts 5, 7, 10, the poorest part of South Tehran. (Fig. 4.6) Similar conditions are apparent for kindergartens; where out of a total of 108 kindergartens there is not a single one in the educational districts 6,7,9, 10 or in Shahr-e-Rey. The distribution of secondary schools reflects a similar pattern. Out of 238 private secondary schools there are only 36 or 15% located in the four southern educational districts of 5,6,7, and Rey. In contrast out of 40 secondary schools there is not a single public school in Shemiran, where they are run either by the private or the semi-private sector.

Finally none of the advanced colleges or universities are located in the southern districts. In the South the majority of the educational establishments are supported by the public sector, while in the north of the city the private sector has a much greater share. The greater proportion of school-age children in the southern districts emphasizes this contrast too. As a result, in the southern districts, the majority of primary schools operate two shifts a day, yet the number of students per class is nearly twice that of the northern districts. Hence the average floor space per student varies from 0.6 sq.m. in district 7 to 2.4 sq.m. in district 2. Furthermore poverty, epidemics and other factors affect conditions in the South (especially in Javadiyeh and Naziabad) lowering the quality of education even more. Thus poverty and overpopulation of

FIG.4.6 CENSUS AND SCHOOL DISTRICTS, 1966.



SOURCES: STATISTICAL CENTRE OF IRAN.

2. MINISTRY OF TRAINING AND EDUCATION.

the schools results in a shortage of facilities such as laboratories, sport facilities and specialist teaching staff which the Ministry of Training and Education is hard-pressed to provide. These factors can be seen in the following table which compares the different educational districts of the city. (Table. 4.10)

TABLE 4.10:
Percentage of Secondary Schools lacking facilities
in Tehran 1966.

District No.	Secondary Schools	without sport facilities %	without laboratory facilities %
1	44	34.1	56.8
2	42	35.7	56.8
3	64	39.0	78.0
4	38	50.0	100.0
5	29	76.0	55.0
6	24	54.2	41.7
7	10	50.0	100.0
8	41	36.6	12.2
9	21	23.8	100.0
10	19	31.6	31.6
Total	332		
Average		42.1	45.3

Source: Ministry of Training and Education Statistical Section, Annual Report, Tehran, 1967.

Thus the above figures as a whole reinforce the North-South contrasts and confirm the fact that in education, the South especially urgently requires the provision of more educational facilities.

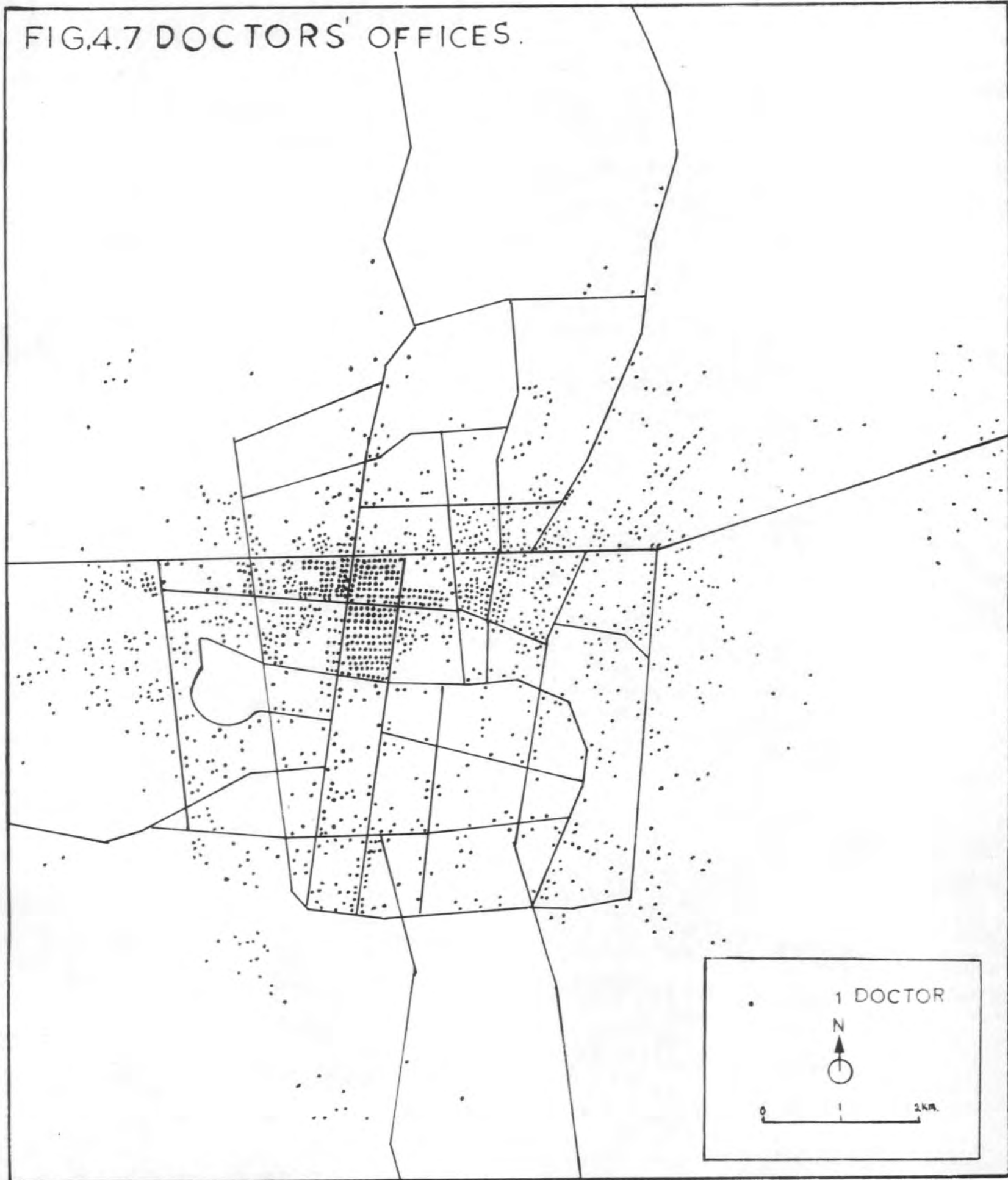
2. Medical Services

In 1966 there were 87 hospitals and maternity homes in Tehran with a total of 10,335 beds ranging from 1,100 beds at the largest hospital to 5 beds at a small clinic. This gives a ratio of 4 beds per 1,000 inhabitants. 4.6% of the hospitals had 400 beds or over and 39% had more than 100 beds. The large hospitals with more than 200 beds were totally run by the state. Based on the system of management two types of institutions can be recognised, private and the state hospitals. The state hospitals include those which can be used by the general public (30 hospitals i.e. 34.5% of the total number) and those which can be used by government employees (16 hospitals i.e. 18.4% of the total number). A marked concentration of private doctors' establishments including consultants, surgeons, general practitioners, and dentists can be seen in the area between Khiaban-e-Sepah and Khiaban-e-Shahreza, and Khiaban-e-Razi can be isolated as a specialist street, almost entirely devoted to medical services. To the north east of the Central area it is interesting to note that concentrations of such services are low, apart from mid-wives, which is the result of the low income among the population and this is ability to buy medical services. In 1967 there were 2,256 doctors' surgeries of which 67 were in Tajrish. Of these 971 were specialists, and 1285 were general practitioners, some of whom maintained an establishment in the north, as well as in the Central Area of Tehran. (see Fig 4.7)

3. Religious Institutions

Islam is the religion of nearly 98 per cent of the

FIG.4.7 DOCTORS' OFFICES.



SOURCE: ATLAS OF TEHRAN. 1969.

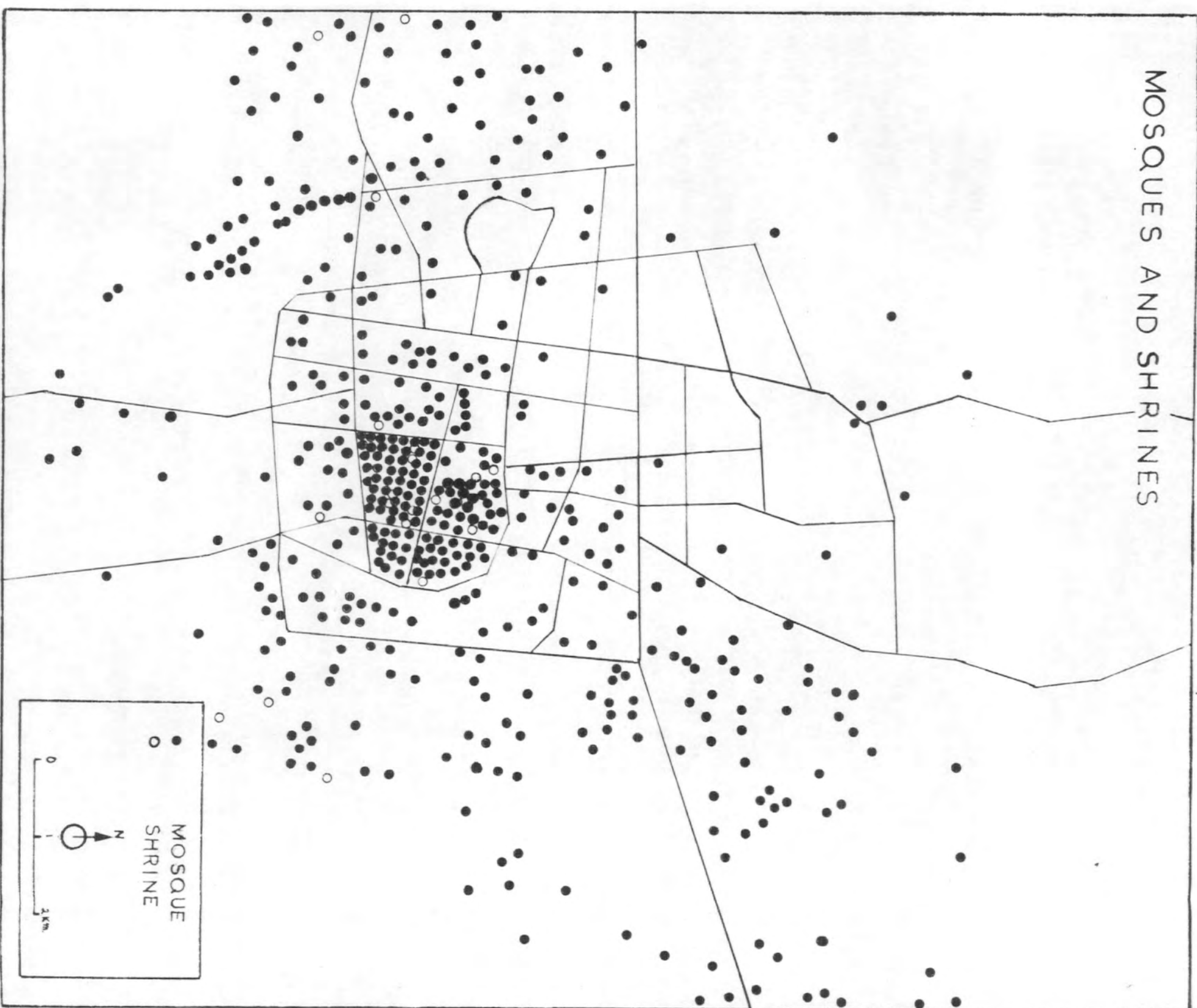
people, hence mosques are the main type of religious building in Iran. Besides mosques there are a large number of other religious buildings for Moslems, with differing degrees of importance, discussed generally as shrines. Mosques are chiefly congregational places for the observance of religious duties including mourning ritual, celebrations, religious festivals and weekly prayers. Some of them may also act as theological colleges (madrassah).

In Tehran there are 750, mosques and associated institutions. The distribution of mosques in Tehran forms a very interesting pattern. A highly congested pattern in the old city especially around the bazaar contrasts with the outer zones, particularly the north. The number of mosques tends to decline as distance from the city centre increases, and this is most marked in high income areas especially to the north. This northerly decrease supports the hypothesis that there is a negative correlation between northerly expansion and the location of mosques. This reflects the fact that with the passage of time and increasing affluence religious affairs play a smaller role in urban life. Mosque distribution therefore reflects a decline in the influence of religion on the traditional way of life in Iran particularly in the capital.

According to the 1966 census there were approximately 173,000 non-moslems living in Tehran. These minorities have their own religious buildings such as churches, synagogues, and temples. The location of such buildings, is a good criterion for locating the residential areas of such minorities,

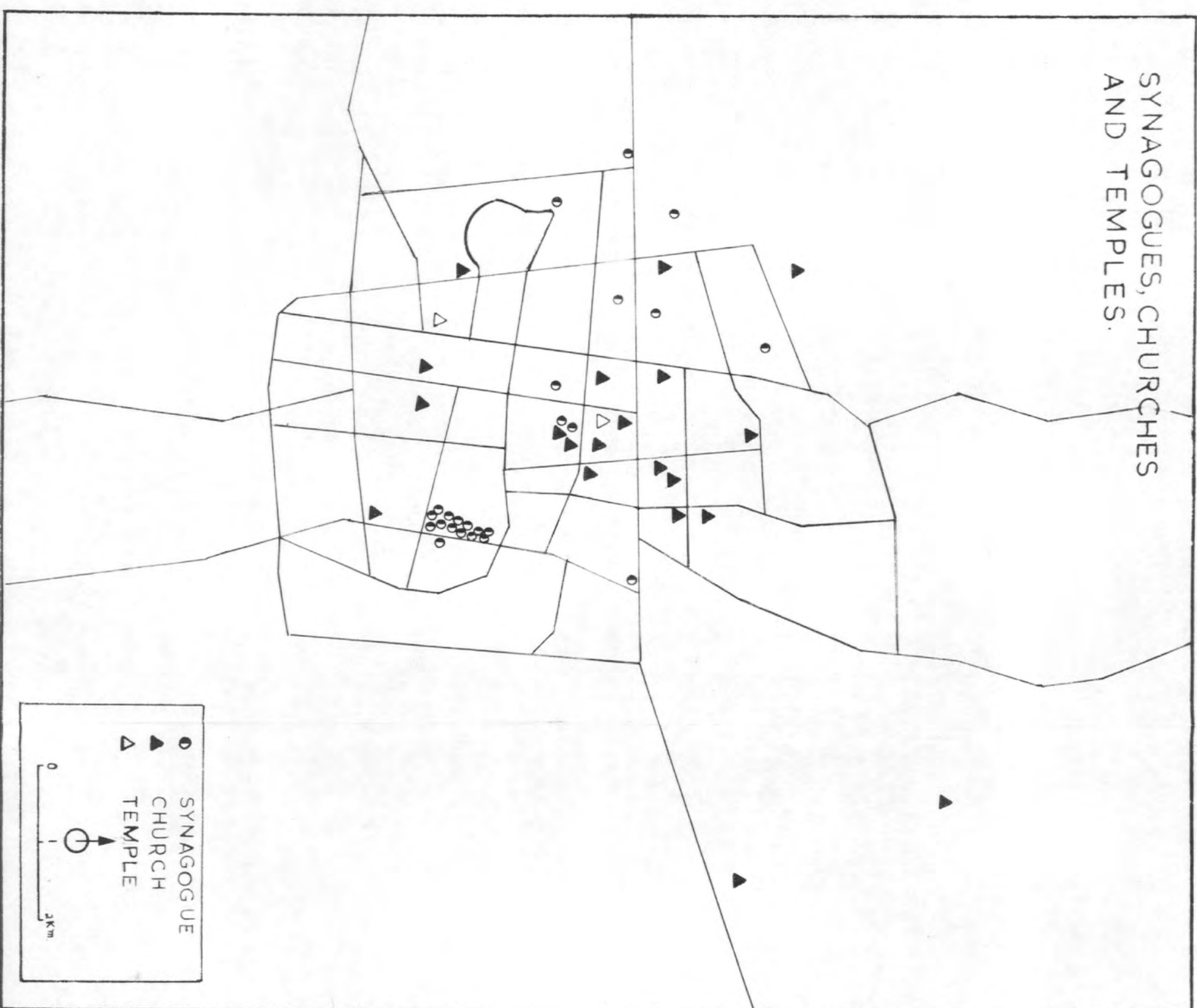
FIG. 4.8 RELIGIOUS INSTITUTIONS

MOSQUES AND SHRINES



SOURCES: ATLAS OF TEHRAN & FIELD WORK.

SYNAGOGUES, CHURCHES AND TEMPLES.



particularly as detailed spatial data on the topic is unavailable. For instance an agglomeration of synagogues in Khiaban-e-Syrus indicates an area of Tehran where large numbers of the Jewish community are found. In general the location of non-moslem buildings shows that they are found. In general the location of non-moslem buildings shows that they are well distributed in the city particularly in the north. Such a location indicates their recent establishment, and in the meantime, it may be a response to the fact that in this area religious minorities enjoy greater freedom, with a higher degree of tolerance than from the more traditional Moslem adherents in the older parts of the city. (See Fig 4.8)

4. Cemeteries

Cemeteries in Moslem cities tend to have a peripheral location. Hence isolation is one of the immediate features of the location of such land uses and this in turn has severely impeded the spread of other urban functions. This is a reason why after every major expansion in Tehran such as in 1937 all the peripheral cemeteries have been built over; for instance the present Park-e-Shahr has been built partially on the site of an old cemetery (See Fig. 2.2 map of Tehran 1891). Apart from some of the shrines and mosques which are used partly as cemeteries, the main cemeteries of Tehran are located to the south-east on the east side of the Khorasan road, where climatic conditions produce a semi-desert environment making the area unsuitable for more productive purposes. There is not a single cemetery between Khiaban-e-Sepah and the northern suburb of Qulhak. The

reason for this is the obvious unpopularity of such features near high-class residential dwellings. Cemeteries in the extreme north belong mainly to the old villages now submerged by the urban expansion of Shemiran and Tehran.

Cemeteries in Tehran can be divided into two categories, private and public which differ in the amount paid for a grave plot. Naturally the private ones are much more expensive. The size of cemeteries usually bears a direct relation with the population size of each city. In Tehran, they differ from as large as 36 hectares to as small as 300 square metres. In the capital and surrounding areas there are 42 cemeteries with a total area of 90 hectares. Nowadays however, either because of hygienic reasons or unpopularity, mosques and shrines within the city are no longer used as grave yards. Furthermore increase in population has resulted in the Municipality of Tehran constructing a large cemetery on the road to Qom to the south of Shahr-e-Rey which will be adequate till the end of the century. The distribution pattern of cemeteries belonging to the various minorities tends to follow that of Moslem ones, for they are mainly located to the south of the large public cemetery to the south-east of Tehran, and here Christian and Jewish cemeteries are found.

II. Public Utilities

This section will select certain of the major urban utilities and analyse their growth and influence on the present day urban geography of Tehran. Parallel with the other development programmes taking place in Iran, public utilities play a large part in urban development schemes.

This in fact is an immediate outcome of public demands for urban living and the rapid growth of the urban population of Iran in recent years. Growth of urban population as already stated is partly because of natural increase and partly due to rural in-migration to township areas and large cities in order to seek employment or a better life. Furthermore increases in household income as a result of economic and industrial growth, is another reason which promotes the creation and extension of different public utilities such as water supply, flood control, sewage disposal, and electrification.

Since the beginning of the Third Development Plan of Iran (1962-67) high priority has been given to urban developments of which public utilities have received the highest share of investment.

1) Water Supply

For a long period the traditional 'qanat' system was the most important water source, producing sufficient water for Tehran's needs but, in extremely dry summers, severe water shortage occurred.

In the 1830's one of the first plans to increase the water supply to Tehran was made. Two water channels were proposed which would bring water to the city from the Karaj and Jajrud rivers.⁴⁰ This idea however proved unsuccessful.

In the 1920's Tehran was supplied with water from 48 'qanats' and numerous wells which were in private and 'vaqf' ownership.⁴¹ Because of the growing population, such resources fell short of the increased demand for water by the city's population. Hence in the late 1920's work on

a project resulted in a 53 kilometre channel (20 kilometres of which were covered) being built to bring some 40 million cubic metres (900-1700 litres per second) from the Karaj river to the city.⁴²

However, an absolute shortage of water and the relatively low purity of existing supplies was a big problem which for a long period remained unsolved. Such conditions remained until Tehran was provided with a water pipeline in 1955.

Thus present water resources in Tehran are mainly supplied from the following sources (i) 'qanat', (ii) well, and (iii) water pipeline based on the Karaj and Jajrud rivers.

(i) 'Qanats': Because of the geographical site of Tehran, the 'qanats' still contribute a high proportion of the water of Tehran. Although the digging of modern wells has to some extent affected the water table, 26 'qanats' provided 23 million cubic metres of water per annum for Tehran in 1966. Since the provision of a piped water supply, utilization of 'qanats' has been chiefly for irrigation purposes but still in the southern suburbs it remains the main source of domestic water supply.

(ii) Wells: Until the late 1940's there were a number of shallow wells of 10 to 40 metres depth, providing a limited amount of water.⁴³ Ownership of a well, because of periodic water shortages was a matter of importance, although cost restricted ownership to the upper classes and the foreign community.

Since the 1950's, considerable attention has been paid to artesian wells. These wells, which belong mainly

to the Tehran municipality have been sunk in Shemiran and on the city periphery, where piped water is not yet available. These wells which are mainly for public use have been increased in number from 23 in 1956 to 91 in 1966.⁴⁴ In addition to this there are eight artesian wells in Tarasht village, in the west part of the city, operated by Tehran's Water Organization. In the case of an emergency their flow can be increased to produce 31 million cubic metres per annum.

(iii) Water pipeline based on the Karaj and Jajrud rivers. Until 1955, Tehran was not provided with piped water, so the number of people who could have access to good quality drinking water was very few. For a long time 'juy' (uncovered channels) running through the city, were the main source of water supply for both domestic and agricultural purposes. Most of the houses were provided with 'hose' (pools) and tanks to store water for long periods. Such unhealthy conditions have been linked with several epidemics, strongly emphasising the necessity for a piped water system. Because of financial problems however, the proposed project did not start until the late 1940's. The initial project which took about six years to complete, provided a 455 kilometre network of water pipelines linked to six large storage reservoirs throughout the city. From 1955 to 1960 the Tehran water pipeline company also purified water from the water supplied from 'qanats' and wells.

In 1960 the construction of the Karaj dam considerably increased the water supply of Tehran for it could produce more than 180 million cubic metres per annum.

Taking only 100 cubic metres of refined water as the average consumption per person in 1966, Tehran plus Shemiran and Rey required 300 million cubic metres, while the available water was only approximately 240 million cubic metres. Since then ever increasing demands for water have been stressed as a result of the continuing increase in population together with recent expansion of industrial activities. Hence in 1968 the need for further water supplies resulted in a new dam being constructed on the Jajrud river to the north-east of the city. The new dam can provide some 80 million cubic metres of water per annum. Yet all these sources in toto produced no more than 300 million cubic metres per annum. (see Fig 4.9)

There is no doubt that the present water supply of Tehran cannot meet the likely future demands of the city. For instance there has been a considerable increase in the number of applicants for piped water, from 112,000 per annum in 1960, to 228,000 in 1967.⁴⁵ Yet, because of improved living standards and further expansion of industrial activities, a much greater water supply will be necessary to meet these demands. Still greater amounts of water will be required when the large number of urban renewal and development programmes now being undertaken in the city are completed.

Although recent projects include starting the construction of a dam on the Lar river, this new source will not be available until 1975. To avoid the drastic water shortage which appears inevitable, the following solutions can be suggested. Firstly some programme to

reduce water wastage, is essential especially in the northern suburbs where much water is wasted on watering gardens, and secondly an increase in water charges to minimize water utilization, and thereby decrease demand. Being able to pay the rates the inhabitants of the northern suburbs tend to be extravagant in their use of it, to the detriment of the inhabitants of the southern suburbs. In the south water tends to be less pure, having flown through the city to reach these districts. Piped water rates tend to be relatively expensive for the southern, poor-class users who tend to rely on communal sources of water, including pumps installed at frequent intervals by the water organization.

2) Flood Control:

Because of the north-south slope on which Tehran lies, during spring melt-water from the Alburz and precipitation over Tehran combine to produce flooding within the city. In the past natural drainage channels dealt with this problem quite effectively. Now, however, drainage through these channels has been partially restricted by urban development, and asphaltting has reduced absorption rates. 'Juys' are also important in directing the flow southward, but the expansion of the city has resulted in the accumulation of greater amounts of water, especially in the southern suburbs. Flood control programmes take into account the natural drainage channels of the Alburz foothills but also aim at relieving pressure on these and on the 'juys' by the construction of underground drainage channels. Four such channels were completed in 1971, which follow the four

major north-south khiabans, Shahbaz, Syrus, Khayyam and Simetri, before they rejoin the natural drainage systems to the south of the city.

3) Sewage disposal:

The semi-arid nature of the climate of Tehran, together with the soil texture (see Chapter 1) means that sewage can be disposed of quite efficiently by the simple means of digging a 10 to 15 metre hole under premises, the liquid waste draining in a southwards direction. Solid waste may be periodically emptied. No overall disposal network is in operation, apart from the system of 'juys' which take surface waste away from the north but accumulate it in the south, with resulting health hazards. Individual premises have individual sewage disposal units for their own use. The problem of disposal has never been immediate but with the tremendous increase in the population it is likely that serious problems of health will develop in the future. Schemes to provide a disposal system would be extremely expensive, not only because of the haphazard nature of existing arrangements but also because of the tremendous amounts of water demanded by such schemes. Action is however necessary to prevent future disaster, and the four channels constructed for water drainage may be utilized for such purposes.

4) Electricity:

The Ministry of Water and Power has divided the whole country into eleven regions the "Tehran Regional Power Company" being one of them. Table 4.11 compares the power consumed in Tehran with the whole country and

Table 4.12 the consumption by type of consumer.

TABLE 4.11:

Power consumed in Tehran and the rest of the country.
1963-68

	(1,000 K.W.Hrs)					
	1963	1964	1965	1966	1967	1968
Tehran	253,569	308,603	393,311	516,154	708,233	1,055,221
Rest of Country	308,768	381,926	423,086	547,614	700,370	870,004

Source: Ministry of Water and Power, 'Report on Power Development in Iran' during the Third Plan, 1968.

TABLE 4.12:

Power consumed in Tehran and Iran by type of consumption
1968

	Tehran	Rest of Country
Total	1,055,221	870,004
Domestic	402,546	236,464
Commercial	227,255	136,572
Industrial	296,368	339,281
Agricultural	33,051	15,565
Street lighting	96,001	77,760
Others	-	64,352

Source: Ministry of Water and Power, 1968.

A comparison of Tehran and the rest of the country in 1968 shows the great primacy of Tehran over the rest of Iran. This primacy is also reflected through time. This consumption level is yet another indication of the primacy of the capital city ⁱⁿ industry, commerce and other activities.

Electricity is produced by the Karaj, Jajrud, and Sefidrud dams and also by oil-fired generators such as that

recently constructed in Farshabad, which has a capacity of 250,000 kilowatts. Various establishments such as the Bank-e-Melli, Silo-e-Tehran, and the Saltan^atabad Arsenal, have individual generators to provide their personal requirements. It appears that supply can keep pace with demand, but in so doing power has to be obtained from generating plant 800 kilometres away in Khuzestan. (Mohamad Reza Shah dam).

Chapter 4 - Notes and References

1. Smailes, A.E., The Geography of Towns. P.80 1967.
2. Farman Farmaian, A.A. et. al. Comprehensive Plan for Tehran. 1966, First Stage, (Farsi) Vol. 1 P.36.
3. Ministry of Interior, Report on the Industrial Census of Iran. August 1963, Series 1.2, Vol. 14, Tehran District. p.9.
4. Ministry of Economy, Statistical survey on the Iranian Internal Trade, Tehran, 1965, Publication No. 19, P.21.
5. Ministry of Labour and Social Affairs, Census Results of the Workplaces and Workforce of the city of Tehran. 1969, Table 3, p.77.
6. These are all Persian terms referring to the commercial premises with different size, engaged with both retailing and wholesaling activities.
7. Kéyhan, M. Jograpfiya-ye-Mof. assal-e-Iran, 1932, Vol. 2 pp. 327-329, Tehran (Farsi).
8. Ministry of Economy, 1965, op.cit., p.47.
9. Ministry of Labour and Social Affairs. 1969, op.cit., Table 2, p.37.
10. The survey was based on a stratified Random Sampling Technique.
11. Ministry of Labour and Social Affairs, 1969, op.cit., Table 3, pp. 83-91.
12. Berry, B.J.L. Geography of Market Centres and Retail Distribution, 1967, pp.44-46.
13. 'Sargofli' or 'key money' is a sum of money paid by a renter to the owner of a shop and depends on both size and site value of the premises.
14. Brown, J. A Geographical Study of the Evolution of the cities of Tehran and Isfahan. 1965, unpublished Ph.D. Thesis, Durham, Chapter 5, p.160.
15. Benedick, R.E. Industrial Finance in Iran, 1964, Chapter 6, pp. 65-71.
16. Farman Farmaian, op.cit., vol. 2, p.3-135.
17. National Census of Iran, Nov. 1966, op.cit., Table 21, p.80.
18. Ministry of Labour and Social Affairs, 1969, op.cit., Table 3, p.91.

19. Ibid, Table 3, p.91
20. Ibid
21. I.N.T.O., Iranian National Tourist Organization. Iran Tourist Statistics, Hotels in Iran by class, Report No. 6, 1967, (Farsi).
22. Ministry of Labour and Social Affairs, 1969, op.cit., Table 3, p.99.
23. I.N.T.O., op.cit., Report No. 6, 1967.
24. See Chapter 6, Table 6.1.
25. Institute of Social Studies and Research, University of Tehran, Industrial Survey on the manufacturing establishments of Tehran. 1964.
26. Plan Organization of Iran, 1964.
27. Ministry of the Interior, Industrial Census of Iran. August 1963, Tehran District, Series 1.2, Vol. 14, Table 8, p.13.
28. Ministry of Labour and Social Affairs, 1969, op.cit., Table 1, p.7.
29. Ministry of Economy, 16 large factories in Iran, 1964, p.48. (Farsi)
30. Ibid, p.23.
31. See chapter 2, Historical Development of Tehran.
32. Burgess, E.W. "The Growth of the city", in R.E. Park et.al. (eds.) The city, (Chicago 1925) pp.47-62.
33. Plan Organization 1966.
34. Vieille, P., Tehran, quoted by X. De Planhol, in The Land of Iran, p.449. This was an estimate of Population trends, taking into account growth rates in 1960.
35. Statistical Centre of Iran, map of the Enumeration Districts of Tehran, 1956, 1966. Unpublished data.
36. Ibid.
37. During the five year period of the Fourth Plan, (1968-1972) a sum of 37,350 million rials was devoted to Education. (Iran Almanac 1971 p.423).
38. Ministry of Education, Statistical Section, 1967, Annual Report.
39. Ibid.

40. Water Organization, Memorial Publication on foundation of Tehran's water Establishments, 1955, p.5. (Farsi).
41. Ibid.
42. Ibid.
43. Atlas of Tehran, op.cit., 1969, p.12.
44. Ibid, p.13.
45. Water Organization, Annual Report. 1967.

CHAPTER 5

TRANSPORTATION AND COMMUNICATION

Tehran is not only the political and administrative centre, but also the centre of communications for the whole country. This fact has been reflected in the large area devoted to roads and the great volume of transport equipment functioning in Tehran. The road networks of Tehran give this impression, as the surface area of the city's roads comprises about 49.3 sq.km. or 27 per cent of the total urban area of Tehran.¹ This in fact is a comparable ratio with certain European cities.²

As regards transport volumes, in 1966, there were daily, 17,000 coaches and hired cars, 7,000 lorries, 3,500 buses, 32 trains and 40 aeroplanes arriving or departing from Tehran carrying approximately 217,000 passengers and 40,500 tons of goods.³

Transport facilities within the city consist mainly of buses, private cars, taxis, motor-cycles and bicycles. The absence of a railway system as a means of urban transport is another factor leading to an increase not only in investment in motorable roads, but also to an increase in the number of transportation means. However, in recent years congestion of urban roads has become apparent because of the increasing volume of traffic flow. When analysing the transport system of the city there are two important themes which can be considered. Firstly the external links which connect Tehran to the rest of Iran and also to neighbouring countries and secondly aspects of the internal transport pattern within the city.

A. External Links

a) Air routes:

The size of the country is an important factor behind the expansion of air routes in Iran. In recent years considerable attention has been paid to tourism in Iran as an important factor which again necessitates good air services. For example in 1970, out of a total 374,604 tourists arriving Iran, more than 118,470 arrived via Mehrabad Airport accounting for more than 30 per cent of total number of tourists.⁴

At present there are 18 airports of different categories in operation in Iran of which the International Airport of Mehrabad in Tehran is the most important one, through which Tehran is connected to major centres of the world. In 1968, 296,416 passenger arrivals, 305,626 departures, and 26,217 transit passengers, were recorded at the airport (Table 5.1)

TABLE 5.1:-

Arrivals & Departures at Mehrabad Airport, Tehran
1964, 66 & 68

	Arrivals			Departure			
	Total	Local	International	Total	Local	International	Transit
1964	176,143	85,869	90,274	183,733	85,708	98,025	0000
1966	260,160	112,094	148,066	278,690	115,709	162,984	28,257
1968	296,416	146,373	150,043	305,626	140,971	164,655	26,217

Sources: Records of the Iran National Airlines Corporation (I.N.A.C.) 1968.

The increasing number of passengers (i.e. 68% increase in the total number of passengers between 1964-68) is a good

indication of the importance of this airport. Yet at the moment it is inadequate to cope with this rising demand. It is proposed to expand the existing facilities and the government has set aside 10 million dollars for such work. It is hoped that this expansion will keep pace, with the rising volume of traffic for at least ten years. To meet this increasing demand Iran Air (founded in 1962) the official national airline has acquired jet air craft from America and hopes to bring into service the Giant Jumbo Jets and the Anglo-French Concorde. In 1963 an important policy of the company was a 25% reduction in fares on domestic flights bringing the price down to the level of first class railway fares. This in fact was a great encouragement and led to an increase of passengers on domestic flights. Since 1968 Jet services have also been introduced on internal routes, at first to the popular tourist cities of Esfahan and Shiraz, and later to Abadan, Tabriz, Rezaiyeh, Mashhad, Zahedan and Kerman, which has led to a considerable reduction in flying time to these important provincial centres. This company is now a major International carrier with daily services connecting Tehran to Bombay, London and Moscow and to most Middle Eastern countries. Of the total passengers leaving the country in 1968 about 27% were carried by Iran Air. Although the proportion of total numbers leaving by Iran Air has not altered significantly the absolute numbers have virtually doubled; from 23,759 in 1966 to 40,990 in 1968.⁵ In terms of internal passenger traffic, out of 887,660 journeys made, in 1968, 337,116 or approximately 41% were through Tehran, this is 3 times more traffic than the next largest

airport at Abadan.⁶

b) Railways:

As part of the external network, railways play an important role in linking Tehran with most of the provincial cities as well as neighbouring countries. In 1938 Tehran became a major junction for a south-north line called the Trans-Iranian Railway, the line which is 1440 kilometres in length and extends from Bandar Shahpur on the Persian Gulf, via Tehran to Bandar Shah and Gorgan on the Caspian Sea. It is by this line that major southern and northern provincial cities such as Khorramshahr, Ahwas, Arak, Qom, Sari are connected to Tehran. The attraction of the religious city of Mashhad and the importance of the agricultural products of Khorasan province for Tehran were major factors influencing the construction of the Tehran-Mashhad line (907 km.) in 1957. The opening of the Tehran-Tabriz line in 1958 (650 km.) was another important step in linking the capital to the north-west provinces. With the completion of this line, Tehran not only was linked to the north-west cities of Qazvin, Mianeh, Maragheh and Tabriz but it was joined to the railway system of the U.S.S.R. and in August 1971 was connected with the Turkish system and through it with the whole of Europe. Also in 1971, Tehran was connected to the south eastern city of Kerman a result of the need for raw materials from Kerman to supply the new steel plant near Esfahan. In over all terms, the operation of passenger-traffic services on the railway systems has declined at the expense of cargo traffic. According to Statistics given by the State Iranian Railway, the 3.97 million passengers in 1961 declined to 2.8 million in 1967 whereas.

during the same period cargo increased from 3.95 million tons to 4.1 million tons.⁷ This decline might be explained by the fact that now there are more private cars on the roads, roads are now asphalted, and transport companies are better organized.

It is hoped in the future to connect Tehran with Zahedan and thereby connect with the Pakistan Railway system. The state hopes to transfer the Railway system to the private sector and thereby try to make it profitable.

c) External Roads:

Seven major roads, radiate from Tehran and connect it to other parts of Iran as well as to neighbouring countries.

In a survey carried out in the summer of 1966, these roads were used by 27,500 vehicles, carrying 210,000 passengers and 36,000 tons of goods per day. This survey indicated a 60% increase in the number of passengers compared with a similar survey carried out in 1962.⁸

The roads follow a radial pattern, namely (in a clockwise direction for the north) Shemshak Road, Mazandaran Road, Khorasan Road, Rey-Varamin Road, Qom Road, Saveh Road, Qazvin Road and Karaj Road.

Karaj Road is the most important and accounts for 65 per cent of all motor vehicles and 41 per cent of all passengers (Table 5.2). This road, runs west, connects the capital to the Caspian Sea as well as to western regions of the country and beyond, to Turkey and Iraz. The Qazvin Road to the south west of the city, is in fact part of the Karaj Road for it joins the latter about 25 km. to the west

of Tehran. Parallel with the Karaj Road, a 40 Km. motorway was constructed in 1965 which connects Tehran to the southern parts of Karaj. It is planned to extend this motorway to Qazvin city, 150 Km. to the west of Tehran and to the east it will be extended to the eastern suburb of Tehran Pars.

Mazandaran Road is the second most important road in the area, carrying 15 per cent of the motor vehicles and 11% of the passenger traffic to and from Tehran. (Table 5.2) Going in a north-east ward direction, this road links Tehran to Sari as well as Mashhad.

Khorasan and Varamin Roads connect Tehran to the eastern and south eastern regions, while the Varamin Road is especially valuable for the transfer of fresh fruits and vegetables from Varamin plain to the markets of Tehran.

Qom Road and Saveh Road from the south link Tehran to the central and southern regions of the country. The religious importance of the cities of Mashhad and Qom have been an important factor, adding to the commercial importance of those southern and eastern routes.

The following table indicates the importance of the external roads.

TABLE 5.2: Passenger traffic and volume of goods on main roads to and from Tehran. 1966.

		Passenger Traffic %	Volume of goods %
Shemshak	Road	7	8
Mazandaran	"	11	15
Khorasan	"	5	14
Varamin	"	4	11
Qom	"	5	3
Saveh	"	3	8
Karaj (new & old)		65	41
		100	100

Source: Comprehensive Master Plan for Tehran, 1966, Vol.2 p.159.

In recent years, an increase in the number of motor vehicles has resulted in a high density of traffic on these roads, especially at weekends when the number of motor vehicles is doubled as the inhabitants of Tehran leave the city for recreational purposes. Another problem is the inadequate width of these roads which are on average no more than eight metres. Furthermore 50 per cent of the vehicles using these roads (except on the Karaj road) are lorries which further adds to their congestion. Other factors adding to congestion and transport problems include the building of new factories alongside the roads, and the indiscipline of drivers, especially lorry drivers.

Hence to meet the ever increasing traffic density on these roads, the expansion of the existing network, construction of new roads, together with the improvement of safety measures, such as road markings and traffic control must be undertaken.

In Tehran, the existing terminals for buses and lorries, which are mainly run by the private sector, are ill-provided with repair facilities, usually badly situated and with inadequate space for manoeuvre. The bus terminals which are often small, are usually located around the busy maidans which form the starting points for the major external routes such as the Mazandaran and Khorasan roads, and near the bazaar and Maidan-e-Sepah. On the other hand terminals for lorries are mostly located in the southern part of the city such as at Rey, Khiaban-e-Syrus and Shoosh which result in great density of traffic in these areas.

B. Internal network

The road network within Tehran reflects the nature of the city's growth, in that a clear contrast exists between the pattern of the old city with its winding 'Kuchehs' unsuitable for traffic and the more regular rectilinear pattern of recent extensions. Consequently the old centre of the city is ill served by the modern transport facilities which are geared to the more regular system.

The inability of the internal network to cater with the volume of traffic is becoming more apparent every year. Traffic congestion is perhaps one of the greatest problems in the city and anybody entering the city can not help being aware of the grave inadequacies of the route network. If we take into consideration however that 27% of the area of Tehran is devoted to communications i.e. streets, squares, sidewalks, etc., one could come to the conclusion that perhaps traffic congestion is not entirely due to shortage of roads and streets but to lack of respect for traffic regulations on the part of drivers and pedestrians.

The street network in the centre of Tehran is in the form of a grid that is the streets cross one another along the four cardinal directions, producing right angles. Away from the central part of the city the regularity declines especially to the south, and in the suburbs, the network of streets is in an unplanned and radial pattern in contrast to the city centre. Indeed one of the main defects of Tehran's street pattern is its lack of continuity. Except for Khiaban-e-Shahreza which has been continued and connected

to the external roads in the east and west, all the city's other main avenues, convert after some distance into second class or local narrow streets. This even applies to the most important north-south main avenues of the city, for example Khiaban-e-Pahlavi which comes to an end when it reaches the square in front of the Railway Station. This defect turns such main avenues at their end into congested bottlenecks which restrict a smooth and rapid flow of traffic on them as well as on adjacent streets. Frequent intersections of the local and main network, lack of synchronization of traffic lights on crossroads, unauthorized passage of pedestrians on streets and squares, unsuitable location of bus stops, parking and sometimes double parking of cars along the main khiabans are but some of the major difficulties of Tehran's traffic, causing numerous accidents which further increase road blockages.

The internal road network of Tehran can be broadly divided into three groups on the basis of their width:

a) Main avenues with an average width of 24 to 40 metres which facilitate the passage of traffic on direct routes. These avenues are mostly to be found in the central part of the city with an average distance of less than one kilometre between them. They cover a total length of 250 kilometres (7.6 square kilometres) or 4.2% of the total area of the capital. This amount when compared with the 60 square kilometres of 20 metre roads in Paris is very low and helps to explain why Tehran with such dynamic growth requires many more such roads.⁹

b) Second class network avenues with an average width of 10 to 24 metres lead the local traffic to the main avenues. These avenues with a total length of 110 kilometres cover nearly 2 square kilometres or 1.1% of the city's total area.

c) Local streets with a width of less than 10 metres found throughout the whole city are mostly short, narrow, twisting and often cul-de-sacs. These streets with a total area of 11.8 square kilometres carry 29% of all the network traffic and occupy 6.5% of Tehran's total area. In the Central Area the need for parking space is increasing due to the concentration of ministries, government offices and commercial establishments.¹⁰ By 1966, approximately 500,000 square metres of land in this part had been allocated for parking space.¹¹ But the ever increasing number of cars and the desire of the people for direct personal contact with officials in government offices, has sharply increased the need for more parking spaces. On the other hand, the high cost of land in the Central Area is an obstacle to the allocation of more land for parking as it is not considered a highly profitable investment by the private sector. Consequently in recent years many commercial and administrative units have preferred to move their establishments to other less congested areas. For example the Ministry of Health has moved from Maidan-e-Arg to Old Shemiran Road.

Observation and respect for traffic regulations by drivers as well as pedestrians, erection of flyovers at some critical points such as Darwazeh Dowlat and Pahlavi

Cross-Roads, both on Khiaban-e-Shahreza, construction of underground passageways next to very crowded maidans such as "24th Esfand", "Shahnaz", "Shoosh" and finally the construction of multi-storey car parks in the Central Area and in crowded parts of the city are among the measures which will effectively help to ease the present congestion in Tehran. At least they may be considered as short term solutions to an ever growing problem.

Type and Volume of Traffic in Tehran.

The number of motor vehicles in Tehran has increased greatly from 30,000 in 1957 to more than 145,000 in 1966; almost a five fold increase in 9 years. A breakdown of numbers of vehicles in 1966 is shown in table 5.3. Private cars accounted for 85,500 and form the highest proportion (59%). This is followed by motor cycles (20%) (especially three wheeled ones), lorries (8.3%) and taxis (5.5%).

TABLE 5.3:
Types of registered motor vehicles in Tehran, 1966

Type of motor vehicle	Number	%
Private cars	85,500	59.0
Government and diplomatic cars	7,600	5.2
Taxis	8,000	5.5
Buses	3,000	2.0
Lorries	12,000	8.3
Motor cycles	29,000	20.0
Total	145,100	100.0

Source: Report on Urban Transport System, Tehran April 1970, P.18.

Apart from motor vehicles, the bicycle is also an important factor in city traffic. Although there is no accurate data on the number of bicycles in Tehran, it is probably not less than 100,000.

The main reasons for the sharp increase in motor vehicles can be listed as follows: a) A rapid growth of population, b) Increase of income as a result of economic growth and c) The growth of the automobile industry in Iran.

2. a) Private Cars

Compared with other transport means, private cars have had the sharpest increase in recent years. An annual growth rate of 18 per cent for the period of 1962-66, had increased to 35 per cent by 1966 and a high rate of increase continues at the present time. It is estimated that in 1971 there were 150,000 passenger cars in the city, an approximate 2 fold increase in 5 years.¹² The reason for such a continuing trend is a direct result of further domestic production of cars, such as Peykan and Ariak together with other factors, such as special purchase rates for government employees and forces personnel. As a result the number of private cars per 1,000 population increased from 20 in 1962 to 28.5 in 1966 and to approximately 50 in 1970.¹³ According to a survey on car ownership in Tehran carried out by the Bank-e-Markazi (central Bank) one out of every seven households in Tehran owned a car, with an ownership income threshold of over 220,000 rials per annum (£1,100 c.).¹⁴ Hence, an increase of income is an important reason for the increase in the number of private

cars in Tehran.

b) City Bus Network.

As a means of public transport, buses play an important role in the traffic of Tehran. Low incomes, cheap fares and extensive bus networks are the main reasons for their popularity. The existing network which is operated by the United Bus Company of Tehran utilised 2,741 buses in 1968. Routes total 1,000 km. varying from 2.3 km. to 61.5 km. with the average route being 9.3 km.¹⁵. The availability and cheapness of these buses has to some extent encouraged the expansion of built up areas in Tehran especially towards the north west to Kan where the inhabitants of these areas, are mainly middle class and have fewer cars per head of population than higher income groups.

According to the United Bus Company of Tehran, the total number of buses has increased from 231 in 1956 to 1,587 in 1966 and 2,741 in 1968. During the period 1956-66 the passenger capacity of these buses has increased from 5,982 to 58,382.

The importance of the bus in the urban traffic of Tehran is so great that whilst the existing city buses in 1966 accounted for less than 2 per cent of the total number of vehicles, 59 per cent of all trips in Tehran were made by bus indicating the importance of bus services in the movement of people. (Table 5.4)

In recent years, the high density of traffic, has resulted in greatly reduced bus speeds, so much so that on average it is less than 20 km per hour. The narrowness of

the local network also affects the flow of buses. Hence a large number of mini buses have come into operation in Tehran, because of higher fare structures, this type of movement is predominantly used by the middle-class. Due to the slow traffic in Tehran many people making short distance trips prefer or are now forced to walk.

Because of the rapid increase in population, improvement in the bus network and increase in both the number of buses and length of this network seems to be very necessary.

c) Taxis

The taxis in Tehran are of two types. One is the so-called common taxi painted bright orange and the other is the route taxi which picks up passengers like an omnibus operating on specific routes. The cheapness of taxi services is to be noted and results in growing importance of this type of public transport. Unlike Western European cities such as London, the taxi driver often picks up more than one passenger, although this is illegal and makes the taxi service less exclusive than its counterpart in the west. The total number of taxis now in operation is 8,000 of which 6,200 are common taxis and the remaining 1,800 are route taxis. Mainly because of the low fare structure the taxi is very popular but there seems to be a shortage of taxis compared with demand largely because of the licencing policy operated by the Police and Tehran Municipality.

d) Lorries

The majority of freight transportation both to and from and also within Tehran is by lorry. The registered

lorries for intra-city cargo transportation numbered 8,900 in 1967, of which approximately 8,000 now operate daily in the city, handling all the cities merchandise. (Table 5.2). There are 55 major lorry depots located along the roads to Rey, Qazvin and Qom. However, these depots are not provided with adequate space for loading and unloading of merchandise and their functions are limited to providing only parking space for lorries.

In Tehran lorry traffic is not allowed in business and commercial districts during business hours, but this legal prohibition is not strictly adhered to by the drivers.

Traffic Volume

The total number of journeys in Tehran was 9.8 million per day in 1966 and the number of journeys per capita is estimated at 3.37. Break down by means of transportation for the above journeys is shown in Table 5.4. According to the table, pedestrian journeys form the highest percentage, accounting for nearly 60% of the total or 5.8 million. Next are journeys by bus with 1.9 million, amounting to 20 per cent, followed by private cars with 8 per cent, taxis with 6 per cent and bicycles 5 per cent. (See Table 5.4).

TABLE 5.4: Journeys in Tehran by mode

Type of transport	Number of journeys per day	%
Bus	1,900,000	20
Common taxi	300,000	6
Route taxi	300,000	
Private car	800,000	8
Governmental and diplomatic car	20,000	2
Motor cycle	50,000	5
Bicycle	5,800,000	59
Pedestrian		
Total	9,800,000	100

Sources: Report on Urban Transport System, Tehran April 1970
p.20.

Break down of all journeys by purpose is shown in Table 5.5. Main purposes are domestic, accounting for 42.7 per cent followed by work with 19.2 per cent, shopping with 16.3 per cent, and school with 11.1 per cent; it is noteworthy that the journeys for business have an extremely low rate of 2.3 per cent.

TABLE 5.5:

Number of trips in Tehran by purpose

Purpose of trip	Total in million	Trips per household	Trips per person	% of total
Home	4.19	6.60	1.40	42.7
Work	1.88	2.97	0.63	19.2
School	1.09	1.72	0.36	11.1
Shopping	1.60	2.52	0.53	16.3
Business	0.23	0.36	0.08	2.3
Visits	0.36	0.57	0.12	3.7
Theatre	0.05	0.08	0.02	0.5
Restaurant	0.21	0.33	0.07	2.2
Others	0.19	0.33	0.06	2.0
Total	9.80	15.45	3.27	100.0

Source: Report on Urban Transport System, Tehran April 1970, P.21.

Break down of all road traffic volume by vehicle type shows that passenger cars (the total of private cars and governmental and diplomatic cars) have the largest share, accounting for 45.5 per cent, followed by taxis accounting for 29% buses 5 per cent, lorries 2.5 per cent and other vehicles 18 per cent. Comparison of this traffic volume with the number of passengers by type of transport, shown in Table 5.5, indicates that the traffic volume of passenger cars is considerably larger than the number of

passengers, while on the other hand, the country buses transport a far larger number of passengers with smaller traffic volume.

Turning to the general traffic pattern, based on results of traffic surveys conducted in the main streets between 6 a.m. and 10 p.m. in the winter season, traffic flows on a weekday range from 22,000 to 68,000, vehicle units with the average being 31,000 units per day. On Thursday (the start of the weekend) average traffic is 29,000 units but there is a wide difference in traffic volume depending on roads, ranging from 18,500 to 77,500 units.¹⁶ On this day some roads have more traffic than on weekdays. Traffic volume on Friday is considerably smaller compared with other week-days. Fluctuation of traffic volume by hour shows, the peak traffic flow on week-days and Thursdays to be between 5 p.m. and 6 p.m. with smaller peaks in the morning rush hour, which is from 7.30 a.m. to 8.30 a.m. This is mainly due to the difference in working hours, as shown in Table 5.6, in which the traffic in the evening peak is composed of people on the way home after completing the day's work and people on the way to work plus shopping traffic. On Friday, the peak traffic is between 11 and 12 in the morning with the rate of concentration of 9.4% compared with 8% on week-days.¹⁷

TABLE 5.6:

Working hours in Tehran

Place of work	Working hour
Private office	8-12 a.m. and 1-5 p.m.
Shops	8-12 a.m. and 4-8 p.m.
Government office	7.30 a.m. to 1.30 p.m.
Industries	7.00 a.m. to 3.00 p.m.

Between 7 p.m. and 8 p.m., the traffic on the roads running from south to north such as Khiaban-e-Pahlavi reach 2500-3000 south-bound vehicles per hour. Tajrish in the north is a popular destination during summer evenings, because of its cool climate, and this adds considerably to summer congestion on north bound routes.

The results of traffic counts on certain major khiabans in the city between 8 a.m. and 8 p.m. can be seen in the following table:

TABLE 5.7:

Traffic Volume on selected main avenues of Tehran
1969

Pahlavi avenue	(near Takhte Jamshid)	23,000 vehicles
" "	(" Takhte Tavoos)	30,600 "
Eisenhower "	(" Kennedy Avenue)	31,400 "
Simetri "	(Shah Avenue)	15,500 "
Shah Reza "	(in front of Palace Hotel)	33,400 "
Ferdowsi "	(nearby Shahreza Avenue	35,700 "
Takhte Jamshid "	(between Villa and Ferdowsi)	24,000 "

Source: Department of Traffic Engineering, Tehran, 1969.

Overall traffic flow has increased tremendously in the last few years and as in major west European cities, congestion and accomodation of the motor car is a major problem for city planners. The expansion of Tehran, especially to the north can be directly correlated with the increased use of the internal-combustion engine, because of the tremendous distances now involved in journeys from residential areas in the north to the central area.

To combat congestion urban motorways have been built

and are being built connecting different sub-urban areas, to reduce flows within the Central Area and to provide for the ever increasing demand for good, fast roads providing inter-city connections. For example, the extension of the Karaj motorway north-eastwards to Tehran Pars passing to the north of Abbasabad and eventually to Abali and other winter-sports centres will reduce considerably the flow through Central Tehran. A motorway links the international airport at Mehrabad to the high class tourist accomodation and higher-class residential areas in the north of the city.

Transport networks within the central part of Tehran are not receiving as much attention as those on the periphery, which provides not only a good example of the outward direction of change but also the almost intractable problems in the heart of the city.

Notes and References

1. Farman Farmaian, A.A. et al. Master Plan for Tehran. 1966 First Stage Vol. 1. p.63.
2. Dickinson, R.E. The West European City. London p.479, 1961.
3. Overseas Technical co-operation Agency, Government of Japan Report on the Urban Transportation system of Tehran. April 1970, p.24.
4. National Iranian Airline Corporation, Statistical section Annual report.1968.
5. Ibid.
6. Iranian Statistical Centre, Statistical Yearbook.p.145. 1968
7. Ibid. Table 9 p.136.
8. Farman Farmaian et.al. op.cit. Vol. 2. p.3.159.
9. Dickinson, R.E. 1961 op.cit. p.480.
10. Overseas Technical Co-operation Agency, op.cit. p.17.
11. Ibid.
12. Iran Almanac, 1971, 10th Edition p.493.
13. Tehran Economist, August 1970.
14. Bank-e-Markazi Survey on Car ownership in Tehran. 1965.
15. United Bus Company (U.B.C.) Tehran 1968.
16. Overseas Technical Co-operation Agency April 1970 op.cit. p.21.
17. Ibid.

C H A P T E R 6

LAND USE AND LAND VALUES

A. Land Use

Land use surveys are generally concerned with classifying and recording spatial uses conceived in terms of urban activity systems. Land use maps can be produced in different ways, one of the most common being to map land use by predominant activity groups such as residence, commerce and industry with each land use having distinctive characteristics.

Figure 6.1 (Existing Land Use Map of Tehran, 1970 in pocket at end of thesis) is a generalized presentation of the land uses and selected service activities in Tehran. The map is based on a combination of sources including 2 maps of Tehran published by the National Cartographic Centre (N.C.C.). One was published in 1967 at a scale of 1:10,000 the other in 1969 at a scale of 1:30,000. Other sources are the Comprehensive Plan of Tehran 1968, Atlas of Tehran 1969 and the N.I.O.C. map of Northern Tehran, (1:20,000 1970) together with personal observation and field survey. Complexity of land use is the striking feature. The pattern is a result of the absence of land use planning as well as rapid expansion of the city due to population increase during the last few decades.

Rapid expansion of the urban area resulted in the boundary of built up areas expanding in all directions but especially to the north. Development of new suburbs and township areas has led to the creation of a new urban area linking the neighbouring towns of Rey and Shemiran, covering

a built-up area of approximately 180 sq.km. In this area, a wide range of urban functions are distributed and because this is the capital city, it possesses these functions in their most advanced and varied forms. In southern and central Tehran, the existence of a large number of small premises with different activities produces the most complex patterns of land use.

In the absence of zonal planning, historical and economic factors have been responsible for the distribution of land uses in Tehran. Yet physical factors including climate and topography are other elements effecting the distribution of land use types especially in their influence on residential patterns.

To understand the present pattern of land use in Tehran a brief historical synthesis of various causative factors already mentioned is appropriate. Until the Second World War, the relatively small population and less extensive communications led to minimal land use specialization. After the war however the dynamic economy and rapid expansion of the city due to population increase was responsible for the haphazard expansion of all functional zones, including housing and commercial areas.

Before 1951 legislation was such that any unused land (mavat) could be deemed owned by persons who engaged in the development of it.¹ A large amount of such land was available on the periphery and as Tehran expanded, this land was "grabbed" and "taken into ownership" by a few important speculators. Great profits were made by these people as the land became more in demand. After 1951, however this practice was terminated by new government legislation which put such

land under the control of a bank, specifically created for that purpose (Bank-e-Sakhtemani).

In the meantime, continued migration from the provinces, increased the shortage of land in the central area for housing purposes. This in turn led to speculation and construction in the peripheral areas of Tehran. Because there was no land use planning, large areas on the periphery were divided into lots of different sizes which consequently resulted in an undesirable distribution of land. Increase in land values in the centre of the city was another reason encouraging a centripetal expansion of housing. Hence, a large number of housing units were built on the periphery. At the present time however the scale of very recent development shows that most of these estates are located close to what is now the Central Area of Tehran. Salsabil to the west of Baq-e-Shah, and the end of Khiaban-e-Bahar, are two good examples. In 1956, the Municipality of Tehran, as the legislating authority issued several directives to control expansion of the housing areas. But due to inefficient implementation, haphazard expansion continued. Since compact development was not enforced and rapid expansion of the city continued, the lower cost of land in the suburbs encouraged builders to develop further away from the boundary of the built up areas. As a result, unused sectors of varying sizes were left between the contiguously built up area of the city and these new developments which are only now gradually being filled up. This continuous expansion and infilling of the built up area has resulted in the majority of agricultural areas and gardens such as those in Dulab (east), Northern

Yoosefabad and Vanak, being built on. Furthermore, the land speculators hoping for high profits keep large plots of land in the periphery and wait until they can sell them at the greatest profit. This is one reason why much land around Tehran is not cultivated and just left idle.

The present land use pattern of Tehran therefore is the product of a rapid unplanned evolution in an economic and social system that has undergone tremendous changes during the past few decades. The post war expansion in the city's growth from a tightly knit traditional core and walled city, to a sprawling international metropolis twinned, almost symbolically with the "Spread City" of Los Angeles serves as a continuous background to the changing urban structure. However, the great rapidity and uncontrolled nature of this urban growth has led to frequent intermixing of land uses rather than their segregation. This creates many problems in tracing a clear spatial arrangement of land uses in Tehran just as in other Middle Eastern cities. Indeed, although produced in 1966 only in 1970 did the Comprehensive Plan for the city come into effect compared with Beirut which has had a plan since 1952, or Kuwait since 1960. But as in these cities it may still be a long time before land use legislation is strictly enforced.²

Consequently, there is an irregular and unsatisfactory distribution of many land use types in the city. The spatial patterns of most major functions still reflect to varying degrees the needs and conditions of the traditional economy. In spite of massive investment, figures produced in 1969 by the Ministry of Labour and Social Affairs show that

95% of industrial establishments in Tehran still consist of workplaces which employ less than 10 workers. These are mainly located in the densely built up areas of low income housing in the central and southern parts of the city. Likewise features such as the bazaar, mosques, "Hammams" (Public Baths) and cemeteries are significant reminders of the theme of continuity in even the present day development of Tehran's land use. Moreover, there is a clearly defined division between old and new areas of the city which provide another important theme in land evolution.

Thus any attempt at the application of Western theories of urban spatial organisation, with emphasises the segregation of functions, must be considered with great caution in dealing with Tehran. However, these theories may be of assistance, as competition between different land uses types becomes more severe with economic modernization.

Indeed, as we shall see, migration of different social groups with rising income to more favourable areas of the city or the new locational requirements of modern factory units are all leading to some kind of sectorization of land use, particularly on the city periphery. Elementary zoning policy may, in time, give greater weight to such tendencies.

All land in urban areas may be classified according to its dominant use. These uses include, commercial, residential, industrial, administrative, recreation, transport and agricultural types. Commercial activities usually exhibit a concentrated pattern and often coincide with the administrative area, whilst residential land has a more

extensive character, and is often associated with mosques and "Hammams".

The land use pattern of the principal functions already mentioned is now dealt with, bearing in mind the competition that exists between functions for the most accessible location to the city centre and the centrifugal forces that are leading to the decentralization or outward movement of some of these activities.

1. Commercial Land Use:

Commercial land uses deserve first mention in view of the position they occupy in the hierarchy of rent paying ability in a city in which they have the greatest need for a location in the C.B.D. As they perform a very specialized function, they pay the highest rents, and thus occupy the land with the highest values.

Under commercial land use are considered retailing, wholesaling and commercial service activities, their distribution and the factors responsible for this pattern. There has been a rapid development of commercial land use during the past few decades especially in the case of retailing. In 1969, there were approximately 45,000 retailing units in Tehran or almost 1 unit per 66 persons assuming a population of 3 million for the whole city. However, in land use terms they cover less than 2 per cent of the total land of Tehran (see Table 6.1). Nevertheless, commercial land use has a functional significance that far outweighs the small proportion of the total area it occupies.

Distribution of land devoted to commerce and retailing is shown on Fig. 6.1. The C.B.D. incorporates the old Bazaar

which occupies a central location in the total pattern of both retailing and wholesaling. This area contains about 25% of the total number of shopping units in Tehran. It is surrounded by a grid like pattern of modern less intensive shopping activity. Outside this area, particularly to the north, retail provision has expanded according to a sectoral pattern towards the high income group suburb of Shemiran. This development reflects the northward housing movement of wealthy Tehranis and contains a large number of highway oriented premises related to rising income levels and car ownership rates. In order to provide the most accessible location, these retailing units have a linear pattern along the main routes. Different studies have attempted to examine the retailing function in Tehran of which the work of Farman Farmaian has most closely corresponded to that carried out in Western countries. He postulated a hierarchical scheme involving 7 categories (see Chapter 4 p.68) but ignored the importance of the corner shop. The distribution of land occupied by wholesaling premises exhibits a proximity to the Central Area and to the main external roads leading west, south and east out of Tehran. This orientation to road networks emphasises the fact that good roads are essential for the supply of this sector.

Commercial and personal services have a scattered pattern intermixed with retail units. However some of these services such as Hammams (Public baths) are a feature of continuity in the old part of the city whilst in the northern suburbs their number declines in higher status residential

Table 6.1: LAND USE CATEGORIES IN TEHRAN. 1966

Type of Land Use	Area (sq.km.)	Per cent
Residential	76.5	42.0
Commercial		
Retail	1.9	1.1
Wholesale	0.6	0.3
Offices	1.7	1.0
Hotels	0.3	0.1
Personal Services	2.8	1.5
Total Commercial Area	7.3	4.0
Industrial		
Light	13.2	7.3
Heavy	5.7	3.1
Total Industrial Area	18.9	10.4
Administrative		
Central Offices	1.9	1.0
Local Offices	2.2	1.2
Army	15.3	8.5
Total Administrative Area	19.4	10.7
Health		
Hospital	0.1	0.1
Clinics	1.3	0.7
Total Health Area	1.4	0.8
Educational		
Nursery & Primary	1.3	0.7
Secondary & Vocational	0.8	0.4
Higher Education Institution	1.0	0.6
Total Educational Area	3.1	1.7
Recreational (Parks and Rec.Centres)	2.1	1.1
Social and Public Institutions	2.8	1.5
Transportation	49.4	27.2
Public Utilities	0.7	0.4
Total Areas	180.6	100.0

Source : Comprehensive Plan for Tehran Vol.3. First Stage.

areas.

Several commercial services such as banks, hotels and money exchanges tend towards a segregation of function. It is of paramount importance for their efficient functioning that they occupy central areas usually of high land values with an increasing emphasis on high-rise development. The existing pattern of commercial land use is the result of several factors:

- (a) Population growth and expansion of city area.
- (b) Economic factors reflected in land values, rent paying ability and 'Sarqofli'.
- (c) Social factors.
- (d) Historical factors.
- (e) Planning factors.

(a): Population growth and city expansion are perhaps more important than any other factor. The concept of supply and demand helps summarise their impact. A greater population needs a larger number of shops to provide goods, and the shops tend to be accessible to areas of residential sprawl, whilst still enjoying proximity to the main roads.

(b): Economic factors influence commercial land use through land prices and rent payments. Since a central location is more important for commercial units than most other functions, competition for central space leads to centripetal tendencies in any city. This trend in turn leads to rising land prices again reflected in vertical expansion of commercial units.

As the commercial pattern intensifies, population may decline. In Tehran a 14% decline in population in the Central Area occurred between 1956-1966, as indicated in Chapter 3.

Competition for Central Area space results in the establishment of activities such as jewellers and large retail stores, with high value turnover occupying key locations. Indeed, this tendency may lead to the agglomeration of similar establishments with a high-rent paying ability. For instance the Banking area and money exchange agencies in Khiaban-e-Ferdowsi or the retail segregation in the bazaar are good indicators of this process.

(c) Social factors are involved mainly in the type of activity rather than in the pattern of distribution. Scattered corner shops throughout the northern and western suburbs are significantly owned by Azarbaijani immigrants. In another case large number of florists' shops are run by Mahalatis. Money exchangers are mostly Jews. This is a very small indication of the complexity of the distribution pattern of commercial land use, and the large numbers of different factors involved.

(d) Historical factors are closely linked with the evolution of the city. Before the expansion of Tehran in the early 1870's, the bazaar was the most important commercial area, responsible for both retailing and wholesaling. It contained the area of highest central land values, which declined as one moved away. The northward movement of the commercial units in the late

19th century was a direct result of the creation of several foreign establishments followed by the development of a quarter for high class Tehranis and Europeans in the area between what is now Khiaban-e-Sepah and Khiaban-e-Shahreza. Since the Second World War an increase in general mobility allowed the city to expand, and the direct delivery of goods from firms to the retailers reduced the need of proximity to the bazaar. As a result with the passage of time suburban retailers could themselves move outward to the suburbs to supply the demand from residential areas.

(e) Planning factors: No major planning programmes have been introduced to control commercial or indeed any other functions. However, since retailing activity tends to follow the main Khiabans, which are essentially the only planned elements of the city, modern retailing units indirectly follow to some extent a systematic pattern. This pattern, can be seen particularly well in the Central Area of Tehran as a result of Reza Shah's road network development. The Sepah, Shah and Shahreza Khiabans run in an east-west direction and cross the four main south-north Khiabans of Saadi, Lalehzar, Ferdowsi and Pahlavi and thereby form a grid pattern and incorporate the central shopping area. The same pattern can be seen developing on a more extensive basis on the modern Khiabans to the north, as for example, on Old Shemiran and Pahlavi Roads, running north-south, and on Khiaban-e-Takht-e-Jamshid, Takht-e-Tavoos and Abbasabad running east-west. Modern planned shopping centres are not yet a common feature of Tehran. But a few large modern shopping arcades (the result of private speculation)

are located on Khiaban-e-Shah particularly important being "Plasco Building" which is located on the peak land value point of the C.B.D. at Istanbul Cross Roads. Large and medium sized super markets have emerged in the suburbs, but generally, planning still only effects indirectly the distribution pattern of commercial land use.

It must be stressed that all the above factors are closely related to one another but, in over all terms, land values and site competition are the two most important factors behind the distribution of central functions.

Outside the Central Area, retailing units follow the roads which is partially a direct result of the increase in private car ownership rates and an indication of the sectoral trend in retailing provision, away from the bazaar.

2. Residential Land Use:

As a general rule, residential areas comprise the largest proportion of land use in most cities. This holds good in Tehran, for out of the total built up area of the city (180 sq.km.) almost 42 per cent or 76.5 sq. km. are devoted to housing units (Table 6.1). Such a high proportion reflects the city's large population and the horizontal spread of low storey housing development, with a limited amount of high-rise construction. This case can be supported by the 1966 survey of the Municipality of Tehran, according to which one storey buildings formed 48 per cent of all housing units, two storeys 40 per cent, three storeys 10 per cent and only 2 per cent of housing units were 4

storeys and above.³ Hence, one and two storey buildings accounted for 88 per cent of the total houses in Tehran.

The rapid expansion of population is the main reason for the city's housing expansion, so much so that recent residential building has hardly kept pace with the rising demand for houses. Unlike other Middle Eastern cities such as Baghdad and Amman, Tehran does not suffer the problem of major shanty town areas. However, an ever increasing number of immigrants must be absorbed by existing dwellings, particularly in the south western and south eastern districts of the city where population densities have risen dramatically from densities which formerly were not low. This fact together with the high natural increase of population is a major reason for the increase in household size in Tehran from 4.1 person to 4.7 during the 1956-66 intercensal period.⁴ Indeed, during this time the population of Tehran almost doubled in size with the expansion of the residential area being characterized by enormous sprawl. This in turn resulted in the creation of more than 20 large and small residential suburbs extending along the major roads to the north west and, to a lesser extent, in the eastern parts of the city.

Although, the 1956 census does not show the number of housing units, data contained in the 1966 census helps explain the rapid rise in housing construction during the intercensal period. Such a trend can be seen clearly from Table 4.6 in which houses less than 10 years old comprise 210,917 units or 60 per cent of the total housing stock, an increase of almost 22,000 new houses per annum. Furthermore

it shows the rapid peripheral expansion of residential land use. District 2 and especially district 5 represent the central and old parts of the city in which two-thirds of the houses are more than 10 years old. The latter district comprises the 19th century residential areas including Udlajan district to the north east of the bazaar. There is a southward extension of housing from the bazaar to the east of the Railway Station (Fig. 6.1). Apart from their age these houses are characterized by several features of slum areas. For instance wood, sundried brick and mud are the construction materials used in 13% of the houses, which is the highest figure for the use of these materials in any district of Tehran (Table 4.6). Here, the houses have a mixed and congested pattern with houses of former wealthy Tehranis containing large court yards and 10 to 15 rooms, located next door to the usual 2-3 roomed single storey buildings of the poorer classes. In contrast, a very high proportion of the housing less than 10 years old comprises the peripheral residential districts of 6,7,8 and 9. In district 9, covering north and north western Tehran 60 per cent of housing units were built after 1961, with only 15 per cent more than 10 years old.

Apart from the housing estates built in the public sector such as Kuy-e-Narmak in the north east, Kuy-e-Kan in the north west, and Naziabad and Nohom-e-Aban in the south west, the private sector is responsible for the majority of recent housing construction.

In the absence of any zonal planning programmes there have been few controls on city house building so that

residential land use in the suburbs has undergone a mushroom-like expansion. Some housing estates which were initially constructed to a specific plan or design have been engulfed by surrounding developments of the private sector. The housing estates of Naziabad and Narmak, for example, began as well planned schemes but were later surrounded by a mass of small-sized premises built by private developers. Except for four blocks of four storey buildings, the area of southern Tehran is characterized by one or two storey buildings of low quality construction. Furthermore, continuing immigration, results in rising population and housing densities, since every available plot is subdivided for house building with open spaces between houses being absent or kept to the minimum.

Huge immigration of low income groups into Tehran from 1950 onwards has encouraged middle class families to move to residences outside the central area from the 1960's. A flow pattern which the increasing traffic congestion in the city centre and the greater attraction of the northern suburbs positively encourages. This movement has tended to accentuate the existing north-south contrast in the density and quality of residential land use and land values. The present residential land use pattern with some exceptions shows a fairly orderly distribution in a south-north direction in which the low income groups are to the south, the high income groups to the north and the middle income groups in between. Such a spatial pattern has been encouraged by physical features including climate

and topography.

Indeed, a number of different factors have been responsible for the expansion of residential areas. They can be divided into broad categories: physical, economic, social and historical, planning programmes, and government policy.

Physical factors provide some basic elements of continuity which underlie the changing patterns of residential land use development in Tehran. The considerable importance of the physical environment will be better understood if the role of climate and water resources is considered in relation to settlement and housing development in the semi-arid region of Tehran.

The traditional water supply by "qanat" has contributed much to the development of settlement in Tehran. In fact, before 1955, "qanats" were the major source of water for the city. These underground systems were therefore extremely effective in controlling residential land use expansion. With the presence of piped water, however, the domestic use of "qanats" has declined considerably, yet a large number of gardens are still watered by them. The importance of water supply was crucial to the initial development and expansion of even relatively late suburbs such as Yoosefabad and Tehran Pars. The topographical element has had an indirect effect on the water supply system but it has had a direct effect on barriers to residential expansion, the problems of low lying land and the influence on wind direction. Peripheral topographic barriers such as mountain ranges to the north and east are the most visible elements preventing the housing

expansion in these directions. For instance, Fig 6.2 shows how the Anti Alburz range (Kuh-e-Sepayeh) to the east has prevented suburban expansion and directed it towards the north east. Apart from the peripheral barriers, some of the hilly areas to the north such as those to the north of Abbasabad, have affected the residential expansion within many undeveloped areas in spite of a rising demand for housing. The same condition applies to low lying land, particularly the flood courses running in the northern, western, and eastern parts of the city in a north-south direction. Since Tehran is expanding in a northerly direction towards the foothills of Alburz, its peripheral areas are often subject to seasonal flooding. In recent years as vast areas of the northern suburbs are paved and developed the amount of surface water has consequently increased. Furthermore, as a result of land speculation and housing activities large parts of flood courses especially in the north west and north east have been filled in or the land beside them has been built over and thereby tends to inhibit their flow and that of run-off water in times of flood. The north-south gradient of the city results in most of surface and waste water being directed to the south and especially the south west of Tehran in "juys" which can only accommodate a limited amount of water and frequently flood in spring. Consequently, this area contains tracts of marsh-land which in turn prevents housing expansion towards the south and south west of the city in the region of the Qaleh Morghi Military Airport.

At the micro level topographic elements also effect

FIG.6.2 THE ANTI-ALBURZ ANDEASTERN RESIDENTIAL GROWTH.
1961



SUPPLIED BY THE N.C.C., TEHRAN.

the residential land use pattern by wind direction. The northern heights of Tehran and southern plains have a continuous circulation of wind generating a "Fohn" effect. This has been a very important factor influencing the orientation of housing units in a south-north direction, in order to obtain fresh circulating air. This factor has been reduced in importance recently by the great increase in the availability of air-conditioning systems.

Differences in temperature between the northern and southern suburbs are obviously now clear. This in fact is very much related to the different elevation in the north and south as well as the congested pattern of industrial areas in the south. The heat is a more important reason in preventing housing expansion beyond the existing built-up areas to the south.

Besides physical factors, economic factors are of considerable importance in any explanation of residential land use patterns. Land prices and competition between different urban land uses provide some measure of these influences. The low peripheral land prices for example, together with the low construction costs have been exploited by speculative developers who have encouraged the suburban expansion of residential land use. Moreover, the selective process of speculative development is important in the distribution of residential land use. Areas of low land prices and less attractive locations are sometimes developed first whilst other large areas of land on the periphery, often of much greater value, are left idle so that land values will rise considerably and they can be sold for huge profits at an opportune time.

Competition between different urban land uses results from a basically free market situation in which different urban functions compete with each other for a central location, the function paying the higher rent, winning the most favourable site. There is a tendency for land use in the Central Area of Tehran to gradually change from residential to commercial. This is evident from a population decrease in the Central Area of more than 14 per cent and a decline of 23 per cent in the Core Area of Tehran during the 1956-66 intercensal period. In turn, there is the conversion of peripheral agricultural areas for residential purposes with the increasing demand for housing. This expansion has led to the building over of much farm land and gardens such as Doulab (east), Yoosefabad (north) and Akbarabad (west).

Large scale speculation in land and construction has been a consequence of the dramatic rise in demand throughout Tehran. However, this speculation is of a very different character in the north compared with the south of the city. In the northern suburbs land prices have risen sharply but without any marked change in density of development. To the south booming land prices have led to the continuous sub-division of land plots. This results in excessively high population densities of up to 650 persons per hectare in contrast with 70 to 80 persons per hectare in the north.

The expansion of residential land use has been very much a function of the city's massive population increase over the last three decades. This change has been so great that apart from the dense housing areas of the central core,

only a few features of continuity remain of the residential patterns of the Qajar period. Indeed until the Second World War, because of the smaller and less extensive communications, land use speculation in Tehran was minimal. The city's wall in turn was a barrier to the expansion of all functional areas including housing. Furthermore, a desire for proximity to the city centre and insecurity on the periphery were amongst the reasons for the rather slow growth of the city. However, the vast urban population growth from the late 1930's onwards led to the pulling down of the city wall in 1937 and further residential expansion. The large volume of rural-urban migration to Tehran in the inter war years led to more than a doubling of the population from 1920 to 1940 to reaching a figure of 540,000 in the latter year.

After the Second World War further increase of population led to greater housing congestion in the Central Area which contributed to the centrifugal movement of residential development by both the private sector (Akbarabād, to the west of Baq-e-Shah (1941) and Javadiyeh (1949) and the public sector developers "400 Dastgah" (1946-49).

Present direction of housing development owes much to the residential movement of different classes of Tehran society earlier this century. Indeed the sector theory of suburban development (Hoyt: 1939) has some validity in explaining these movements. In particular, the northward expansion of low density, high income residential suburbs towards Shemiran, at the foot of the Alburz mountain has its origin in the fact that the northern edge of Tehran has

always been the home of the city's ruler so that the wealthy, high class families tend to gravitate towards this area. Alternatively, the southern location of much industrial activity and its association with cheaper low class housing, close to the place of work, has contributed to the further southward movement of this type of land use. Recent trends in the pattern of industrial location however are likely to modify this basic pattern in favour of working class housing areas in the west and south west of the city associated with developing industry in these directions.

The importance of social factors on patterns of residential land use is considerable. They are closely linked with economic factors particularly in view of the income differences of various social groups. For example, although religious minorities in Iran, especially in Tehran enjoy a high degree of tolerance, socially there is nevertheless a feeling of separation and a tendency towards segregation. This can be seen in Tehran where there are groups of Armenians settled in the north east and west and a very small part of the northern suburb of Vanak. These are areas with a poor environment and a dense pattern of housing that have gradually been separated from neighbouring settlements; a function of the separate cultural traditions of religious minorities. For example in the north east suburb of Majidiyeh there is a low-income settlement area with a fair concentration of Armenians near to an area of northern high class residences (Abbasabad). However, if these areas are potentially developable as seen

when their speculative value rises to a suitably high level they will be converted to a more profitable use or be developed as higher class housing areas. The Behjatabad area to the north of Khiaban-e-Takht-e-Jamshid has been the site of an Armenian quarter since the Second World War. But from 1960 onwards the rapid increase in land prices has necessitated a change of nature from a "shanty-town" to a high class residential area. The interesting differences between the Jewish and Armenian quarters of Tehran is that the former are located close to the city centre (i.e. in Khiaban-e-Syrus) whilst the latter have a peripheral location. However, in a qualitative assessment of residential land use they both produce a very congested housing pattern in a poor environment.

Immigrants live mainly in a densely populated peripheral area of Tehran and display a similar pattern to religious minorities. The Southern and Western parts of the city are the main reception areas. Azarbaijani migrants form the largest group by number in the community the majority being found in the western part of the city. As a result of low quality construction, the houses in these areas soon become slum-like with a transitional form of tenancy leading to ever increasing densities.

The defining of social areas in the absence of meaningful data of different classes is extremely difficult. Nevertheless areas can be distinguished based on levels of education and employment status, which are closely linked to income differences. The latter, in fact, is a very

important factor in the distribution of residential areas. For example, people in higher income groups can afford to live further away from the centre, in areas with a better natural environment and lower population density. Alternatively, lower income groups have either remained in the older parts of the city or moved in directions other than to the north. In Tehran three different income groups may be distinguished namely high income, middle income and low income groups roughly in a north-south direction. The suburban high income housing areas to the north are characterized by large plots of land containing attached gardens of mainly two storey buildings. They have access to well planned roads and a full range of public utilities. From the Abbasabad area to Khiaban-e-Shahreza there is some vertical expansion of middle income group housing. This is a reflection of higher land values due to proximity to the city centre and results in this area being more densely populated than areas to the north. To the south of Khiaban-e-Shahreza is a mixed residential area with low and middle income groups. However, Khiaban-e-Sepah is a better watershed for low income group housing for from here, southwards the general pattern is of a poor environment and high density housing serving as a reception area for the poorer immigrants. As a result of poor construction it presents a depressing housing area.

The existence of an effective and comprehensive planning programme is an important factor in the reasonable control and distribution of residential land use zones in a

city. Until 1951, existing regulations were not only ineffective but also open to misuse. For instance, "mavat" land, as mentioned above (P.188) was open to such misuse and was exploited by a number of speculators who occupied vast areas of suburban land. With the increasing demand for housing and the absence of land use zoning, large areas mainly in the west and north west were divided and sub-divided into building plots of different sizes which soon resulted in an undesirable distribution of residential land. In 1956, the Municipality of Tehran as the legislative authority issued several directives to control the haphazard expansion of housing areas but their half-hearted implementation did little to stop this trend. In 1966, the first modern town planning programme was introduced to control this haphazard expansion.⁵ However it was not fully effective until 1970.⁶ This plan for the development of Tehran has been divided into a programmed policy of 5 five year periods. To guide future housing construction in the city, four minimum categories of land plot size of 120, 150 and 350 metres have been suggested for different parts of the city. Although recent regulations have to some extent slowed down construction activity, there were still more than 16,500 building permits issued by the Municipality of Tehran in 1970.⁷ Furthermore, with the introduction of boundary limits for future city expansion, which will be reviewed every five years, it is hoped to provide some reasonable control of housing development on vacant and unused land on the city periphery.

Government policy provides a good example of the influence of decision making on urban land use and is closely associated with planning policy. Government policy may affect the pattern of residential or other land uses quite considerably. For instance the Law of Vacant Land (mavat) and Land Registration in 1951, were policies without which a more rapid and irregular expansion of the city might have been expected. A large number of suburban housing estates are the result of government decisions through which, for the first time, low-cost housing was introduced. The creation of Kuye-Nohom-e-Aban is significant in this respect and its striking location on the way to the tomb of Reza Shah suggests that prestige factors may not have been unimportant in its construction. The effect of the government policy on residential or other land uses may be far reaching. For instance, the proposed programme for the creation of a new administrative centre at Abbasabad to the north of the city is one programme which has resulted in the destruction of hundreds of houses in this area. The government took over the houses under compulsory purchase orders and is repaying the former owners in instalments payable in government stock at 7% interest.

3. Industrial Land Use:

The pattern of industrial land use in Tehran stems from its primate role in the country's economy. As seen in Chapter 4, Tehran receives the largest share of national investment, (the precursor of industrial or any land use development), modern factory industry and contains the

largest concentration of the country's industrial labour force. These facts account for the spatial importance of the city's industrial areas.

Considering the complexity of land use and the absence of zoning, any delimitation of industrial land use in Tehran is bound to be difficult. The pattern of land values is reflected to some extent in the existing location patterns. However to define such areas, different criteria may be used particularly the size and the type of the industry. For instance, over time, land values and rent paying ability determine whether industrial premises can remain at a central location or are pushed to a peripheral site. Consequently in an ideal situation a central location can only be supported by those industrial activities such as newspaper printing which can afford the high rents and land values. This of course applies to small, light industries with high profit margins. Similarly high-income groups will not tolerate the close proximity of a heavy industry in their residential area, although 'Ladan' a firm manufacturing confectionary on Abbasabad Road overcome this objection because of the clean production processes.

As a general rule, industrial establishments tend to locate where a number of factors such as, accessibility to raw material, labour force and markets via good roads are present. This, however, applies mainly to the larger modern industries, as has been indicated in Chapter 4. There is however a relation between the size and type of industry and its need for such factors. For example, generally speaking, the larger and more advanced the industry, the

more it needs these requirements. A suburban location for such industries, particularly in the manufacturing field is, therefore, better.

Taking the size of industrial establishments as a criterion for industrial land use, two broad types of premises can be recognized namely large and small. In Tehran according to 1969 data, there were 42,638 industrial establishments of which 95% had less than 10 employees.⁸ Such a large number of premises suggests that the industry is not highly advanced.

The distribution of small sized industrial premises is very scattered throughout the city. However, this does not deny the intensive industrial land use in the centre of Tehran, south of the bazaar, extending south and south-west and including railway land and neighbouring industrial areas. This is the area in which a high proportion of small sized premises may be found. This is in fact partly because of high land prices and rents resulting in a small size of establishment but it does mainly originate from the fact that this area includes the old part of the city in which no radical urban renewal or redevelopment of existing small-scale industries has taken place. Yet in a south and south-westerly direction there is a highly congested pattern of these premises which shows elements of concentration according to industry. In contrast, peripheral districts particularly District 9 including north and north west Tehran enjoy a lower density of industrial establishments with a different type of industry from that found in the central and southern areas

and does not display the same concentrated pattern.

The second category of industrial establishment includes the large factories both old and new which have more than 10 employees and form 5% of the total industrial establishments of Tehran. The space demanding nature of these activities as well as the recent establishment of the majority of them accounts for their peripheral location. Here, land values are much lower than in the Central Area. Furthermore the availability of land on the periphery results in these factories retaining large plots of land for future expansion on either side of the external roads leading out for Tehran to the south, and east, but especially to the west. Indeed, they show a sectoral tendency in their location pattern. Here a broad division can be made between the non basic industries (food-stuff and construction materials) which serve mainly local markets as in the case of brick kilns, cement works and textiles on the Rey and Saveh Roads and the basic modern industries such as machine tools and metallurgical works established during the 3rd and 4th Development Plans 1963-67 and 1968-72 which serve national and, to some extent markets of neighbouring countries. Recent government policy has aimed at preventing unlimited expansion of industry. At present industry occupies approximately 18.9 sq. kms. or 10.9% of the built up area of Tehran (Table 6.1) and planning now aims at a proportional balance of 9% of total land use in the city devoted to industry. The further expansion of existing industry will be excluded from developing in the city, within specified centres; a

likely growth area is the south-west of the city.

4. Administrative Land Use:

The majority of administrative establishments in Tehran have had a central location since the mid 1930's associated with the traditional site of the Arg. In this central area a principal administrative zone can be distinguished bounded by the four main Khiabans of Sevom Esfand (north), Ferdowsi (east), Boozarjomehri (south) and Shahpur (west). This area contains both old and new administrative buildings. The older buildings, constructed in the Pahlavi style include the Ministries of Justice, Foreign Affairs, Police Head Quarters and the General Post Office. The newer buildings are a feature of the 1960's and are mainly 5 storeys or more in height. A concentration of these modern buildings occurs on either side of Park-e-Shahr (City Park) and includes the Ministries of Housing and Development, and Water and Power, the Bank of Agricultural Credits and the Ministry of the Interior. Another grouping of Ministries is found around Maidan-e-Arg: the Ministries of Information, Roads, Economy and Finance. Apart from this area, two other administrative areas can be distinguished. One is to the west of the Central Area extending from Khiaban-e-Kakh to the Western-Sepah Avenue. The Civic Residence of the Royal Family, the Prime Minister's Office and the Senate are located here. Another area is to be found around Maidan-e-Baharestan. The Ministries of Training and Education, Culture and Arts, the Majlis (House of Parliament) and Plan Organization of Iran are some of the important government offices in this area.

Since the mid 1960's, outward movement from the Central Area to the north and west of the city has taken place. For example, the Ministry of Labour and Social Affairs on Eisenhower Road and the Ministries of Agriculture, Natural Resources on Boulevar-e-Elizabeth are examples of relocation. Khiaban-e-Iranshahr to the north of Khiaban-e-Takht-e-Jamshid, represents a local administrative area, and includes the Office of the City Council, Municipality and the Ministry of Science and Higher Education. Recent decentralization of administrative areas can be explained by a number of reasons. Firstly, it is due to the lack of suitable sites in the Central Area, Secondly, the ever increasing traffic congestion which affects the accessibility to offices and thirdly the northward expansion of the city with its more attractive environment, and finally the very high cost of land in the Central Area. One of the very important factors leading to congestion of the central area, which marks it out as different from that of western cities, is the great importance attached to personal communication rather than relying on the sometimes inefficient postal and tele-communication services. This results in a large number of individuals coming to administrative offices.

Apart from their central Head Quarters, the Police, the Post office, the Ministry of Training and Education and the Municipality of Tehran, each have an office or station in wards of the city. Additionally, the foreign Embassies are located in the central and northern parts of Tehran. The important Embassies such as the British,

Russian, German and Turkish, because of their traditional sites, have the most central location close to the peak land value area of the C.B.D. This is a reflection of the long established contact of these foreign powers with Iran the British and the Russians in particular formerly being influential in the political and economic affairs of the country. Their central location indicates their long-standing presence and provides an element of continuity in the city. The American presence dates from the 1890's when their Embassy on the present Khiaban-e-Takht-e-Jamshid was located outside the city wall. This was a result of unsuitable land within the walled area of the city and a reflection of the interest in northward expansion. Yet they like the British have a summer residence in the northern suburbs of the city. The remaining Embassies are located to the north of the Central Area or in Shemiran, reflecting the changing land use pattern.

The large number of offices and military barracks are a reflection of the primacy of Tehran (see Table 6.1). Most existing barracks have been converted from other functional uses such as palaces of the Qajar period. In the past such institutions were scattered throughout the city but the recent building of vast army bases along the Old Shemiran Road suggests a greater tendency towards the concentration of this particular land use. Moreover, more than 1,500 hectares of land in the extreme north east suburban area of Tehran have been designated for army use which confirms the governments policy to shift army barracks from central parts of the city in order to free the land

for alternate uses.

5. Transportation Land Use:

Transportation is a function of interaction between different urban activities; consequently there is a very close correlation between transportation and land use although transportation is a particularly important land use in Tehran in its own right for it covers 27 per cent of the total area. (Table 6.1)

The road network in Tehran is a combination of a traditional and modern system which like other uses represents contrasting patterns of continuity and change in the development of the city. The road pattern in the old core of the city is a complex of narrow streets and maze-like alleys which in the absence of urban redevelopment plans can hardly function as an efficient network. This pattern is very different from the main grid network in the Central Area and the external roads leading out from the city in a radial pattern. In the new parts of the city, modern networks have been designed to maximise accessibility between different land uses. In the meantime the sprawling development of the city is partially encouraged by the creation of new road networks and although the influence of Motorways to the west and north of the city, is not immediately influential, it does provide a potential location for functions such as highway oriented retailing or residential areas at a future date.

The contrast between the narrow maze-like network of the old part of the city and the wide grid-network of the more recent areas on the periphery not only serves to

emphasis continuity within the city but also to point out the rapid changes through which Tehran is passing.

The high percentage of transport land use is partly due to the absence of any intra city railway. However, there is no doubt that fast road networks increase accessibility and produce important changes in the city's land use pattern. The railway land to the south of the city covers a considerable area but is more important, from a transport point of view, at the national and international rather than local level.

6. Recreational Land Use:

The quality and quantity of recreational activities in Tehran varies throughout the city, but in total area covers 2.1 sq.kms. or 1.1 per cent of the total area of Tehran. This is an extremely small proportion (Table 6.1). This type of land use can be studied under categories of firstly recreational centres and secondly recreational areas. The first category includes cinemas, tea-shops, Zoorkhaneh (houses of strength for traditional sports) and recently sport stadiums as well as bars and restaurants. The second category covers parks, city squares and even cemeteries.

Cinemas because of lack of alternative entertainment and the low prices of admission are the most popular centres of recreation for the majority of Tehranis. This is why at present Tehran has more than 110 cinemas and during the 1960-68 period they increased in number by 45 per cent.⁹ Distribution of class of cinemas conforms very closely to areas of different income groups. However, the large number of cinemas in Khiaban-e-Lalehzar is an out-standing

feature of this important recreational quarter.

Tea-shops are also very popular particularly amongst low income Tehranis. Hence their location is largely confined to the old part of the city especially around the bazaar. Tea-shops and Zoorkhaneh are places and centres for the communication of social and cultural ideas. Significant concentrations of night clubs are to be found around Khiaban-e-Lalehzar in the central part of the city serving middle-income groups. A linear concentration of these activities along Old Shemiran road but especially along Pahlavi road serve the high class residents and foreigners of the northern suburbs. The lower-income groups are mainly served by entertainments clustered around Maidan-e-Qazvin where the unique district of Shahr-e-Now is located, a walled area specifically associated with prostitution under government supervision.

Sports stadiums have also recently become popular. Wrestling and football are popular sports which entertain thousands of Tehranis who are accommodated in the Mohamad Reza Shah and Amjadiyeh stadiums every Friday.

Turning to recreational areas, parks and planted areas are of first importance. These areas provide a much needed lung for the city's general public. Unfortunately Tehran, in spite of its huge population and range of functional activities, has an inadequate provision of recreational areas. This fact can be seen from Table 5.1 in which only 2.1 sq.km. or 1.1 per cent of the total built up area of Tehran is devoted to parks and recreation. If the total population in 1966 (2.7 million) is related to

the area of existing parks, the average area per person is less than 1 sq.m. which is a very low ratio. Since 1966, however, three new parks including Park-e-Shahanshahi (Imperial Park), Park-e-Farah and Park-e-Narmak have been created in the city and are equal in area to the previous 17 parks and children's play-grounds.

Apart from being limited in number, parks in Tehran are not very evenly distributed. In fact the Park-e-Shahr (City Park) with a central location is the only one reasonably accessible to the general public. The northern parks are relatively inaccessible to the majority of T ehranis. In the whole of the Central Area of Tehran which is almost 30 sq.km. there are only two parks and two very small children's play-grounds. In the densely populated areas to the west of the city the situation is even worse, as there is not a single park. The same applies to eastern Tehran with the exception of the small park of Khayyam. The southern part of the city is, to some extent better provided with open space than the eastern and western districts. It contains 4 parks and 4 children's play-grounds although because of the high population density and proximity of industrial areas, more are urgently needed.

To the north parks are not only more numerous but also they are larger than others in the rest of the city. The Park-e-Shahanshahi (Imperial Park) alone is 30 hectares larger than the other 19 parks and play-grounds in the city and is almost 6 times larger than Park-e-Shahr (City Park) in the city centre.

In overall terms by 1969, every Tehrani had 1.5 sq.m.¹⁰

of park per head an increase of 0.5 sq.m. per head over the 1966 figure which comparison to the suggested United Nations figure of 30 sq. metres per head of population is very low.

Climatic reasons, including inadequate precipitation and water shortage with rapid evaporation as a result of aridity are the main reasons why Tehran suffers from shortage of parks. The existence of parks brings in turn a great demand for artificial irrigation which is very expensive. However, socio-economic factors and religious beliefs also have limited the development of parks and other recreational areas in the city in that cultural traditions have not emphasised recreation as a necessary part of life. It must be added that in general with the exception of its extreme southern limits, Tehran does benefit from the existence of some large open planted areas not used by the general public. These to some extent reduce pollution levels by providing environmental areas which slightly alter the micro climate. Principally these include the existing large barracks scattered throughout the city as well as foreign embassies and administrative buildings. As military barracks in Tehran have a fairly regular distribution they could provide good potential locations for public parks. In view of the government policy to decentralise these barracks there is a strong possibility that they could be converted to areas of public recreation which are increasingly necessary with rising pollution levels from traffic, industrial activities and also population growth.

Present government policy in providing for a better physical environment in Tehran and its surroundings has

been reflected in the establishment of a Green Belt. Such an area can be seen to the north of Mehrabad Airport along the Karaj Road where hundreds of hectares of land are devoted to forest. Under the same programme tree planting is beginning on the slopes of the Alburz mountains to provide a green and pleasant background for the city.

Other recreational centres are outside the city attracting all type of residents. The valleys of the Alburz foothills to the north of Tehran are very important in this respect, providing "free" entertainment and good climatic conditions. Cheap transport puts these areas in easy communication with all parts of the city. Most inhabitants of the south go to the nearby religious centre of Rey with its associated springs (Cheshmeh Ali) which provide ideal picnic spots. Short pilgrimages provide major opportunities for escape from the city and are invariably combined with a social as well as a religious element. Further removed from the city especially to the north-east and north-west are areas utilized more by higher-income residents of Tehran, increases in car-ownership levels having brought such winter-sports centres as Abali and Shemshak within easy reach of Tehran. The water behind the Karaj dam is mainly utilized by such higher-income residents, again a function of its distance from Tehran. Even the Caspian Sea, beyond the Alburz, is now within reach of people and an increasingly popular form of entertainment is to spend week-ends at the sea-side.

7. Land Use Pattern of Selected Services and Public Utilities:

Such establishments although functionally important are not major users of land. Educational establishments occupy 3.1 sq.kms. of the total area or 1.7% and show a very scattered distribution. More educational establishments are to be found in the south of the city but these, in general terms are inferior to those found in the north. Again the private sector is more important in the north than in the south. Because of their scattered nature their portrayal on a map is virtually impossible. In the case of higher educational establishments, their relatively greater demand for space allows their location to be shown (See Fig. 6.1).

Establishments devoted to the provision of health facilities, occupy 1.4 sq.kms. or 0.8% of the total land in Tehran (Table 6.1). There is however a significant concentration of these facilities in the north west of the Central Area of the city despite a scattered distribution throughout the northern suburbs.

Mention should also be made of religious buildings, again scattered throughout the city, but a concentration within the Central Area can be seen. There is certain decline of the incidence of such buildings to the north, reflecting the continuity of the functional importance of the Central Area and the changes being effected in the northern suburbs which tend to house the higher class residents with a more western outlook, attaching less importance to religious affairs. There are 750 religious buildings devoted to Islam varying in size from 80 sq. metres to as large as 7,500 sq. metres, and occupying 0.24% of the

total land of the city.¹¹ Such a small amount of land devoted to religious affairs is not however an indication of the unimportance of this aspect of land use.

Cemeteries are space-demanding and tend to have a peripheral location, a reflection of their space-demanding nature. They cover 0.29% of the total area of Tehran, and because of their space demands can be shown on the land use map (Fig. 6.1).

Taking utilities into consideration, it is obvious that water-pipelines are not demanding of space because of their position underground, but 16 reservoirs are to be found in the north which rather than being a reflection of socio-economic differences is a direct result of location in elevated areas to provide good pressure for districts further south. These reservoirs each occupy large plots of land, of between 5 to 10,000 sq. metres.

The other major utility considered, that of electricity does not require large areas of land, apart from generating plant which are mainly located on the periphery. Transformers are scattered throughout the city in response to demand, but obviously there is a concentration in the Central Area because of the importance of this area and its greater requirements.

8. Agricultural Land Use:

Agricultural areas in the immediate environs of Tehran are extensively cropped, assisted by the traditional system of qanat irrigation.

After the Second World War, but especially since the early 1960's the rapid expansion of the built up area has

resulted in the building over of many agricultural areas. For instance Akbarabad south-west of Baq-e-Shah (west), Dulab (east) and Vanak and Yoosefabad (north) which were once responsible for the provision of most of the daily vegetable requirements of Tehran, have now been converted into residential areas.

Indeed competition between agricultural land use and other functional areas is a continuous feature. In the case of agricultural areas in Shemiran it is mainly due to the fact that lands have been given over to "Vaqf" that they still retain their traditional function. Yet, because of ever-increasing land prices and also recent government policy on 'vaqf' properties, these agricultural areas may soon be put to a different use.

9. Vacant Land:

A study of vacant land is useful in an analysis of its potential for various future uses.

Vacant land in Tehran occurs mainly in peripheral areas unless there are physical or speculative reasons why an area is not suitable for development. This fact may explain the vicious demand for land for the intensive expansion of housing or other buildings close to the city centre. Land speculation in the past had resulted in large plots of these lands being idle for great lengths of time as their prices rose to a suitable level for sale at tremendous profits. However the recently imposed tax on unused lands within the city limits (1 to 4 per cent of lands value payable each year) and boundary limitation on the built up areas may result in greater development of these vacant areas.

B. Land Values:

Having considered the various land uses within Tehran it is important to analyse land values to understand the close association of the various uses with different values placed on them for they affect the distribution of different urban functions and also produce a hierarchy of land specialization according to its economic importance. Consequently there is a close correlation between the value of land and the function to which that land is devoted.

In an Iranian city two types of land values can be recognized: (a) firstly, land values on the frontage of avenues and (b) secondly, the interior plots surrounded by these avenues. The first category includes mainly commercial functions especially retailing premises, whilst the second type comprises mainly residential units. There are important contrasts in land values between the two categories. In the case of frontal values, site competition results in a hierarchy of rent-paying ability in which a specialized land use having the greatest need for a central location in or near to the central area will pay the highest rents with corresponding highest land values.¹²

In western cities, as a general rule, the city centre contains the area of highest land values, from which, land prices show a fairly regular decline towards the periphery. Vieille has found a similar pattern in a west-east direction in Tehran.¹³ However, when the north-south direction is studied, the land values represent a more gradual decline over a longer distance to the north than to the south.

The main factors behind this north-south contrast

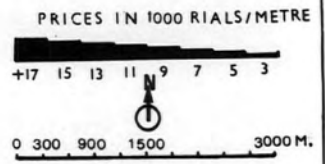
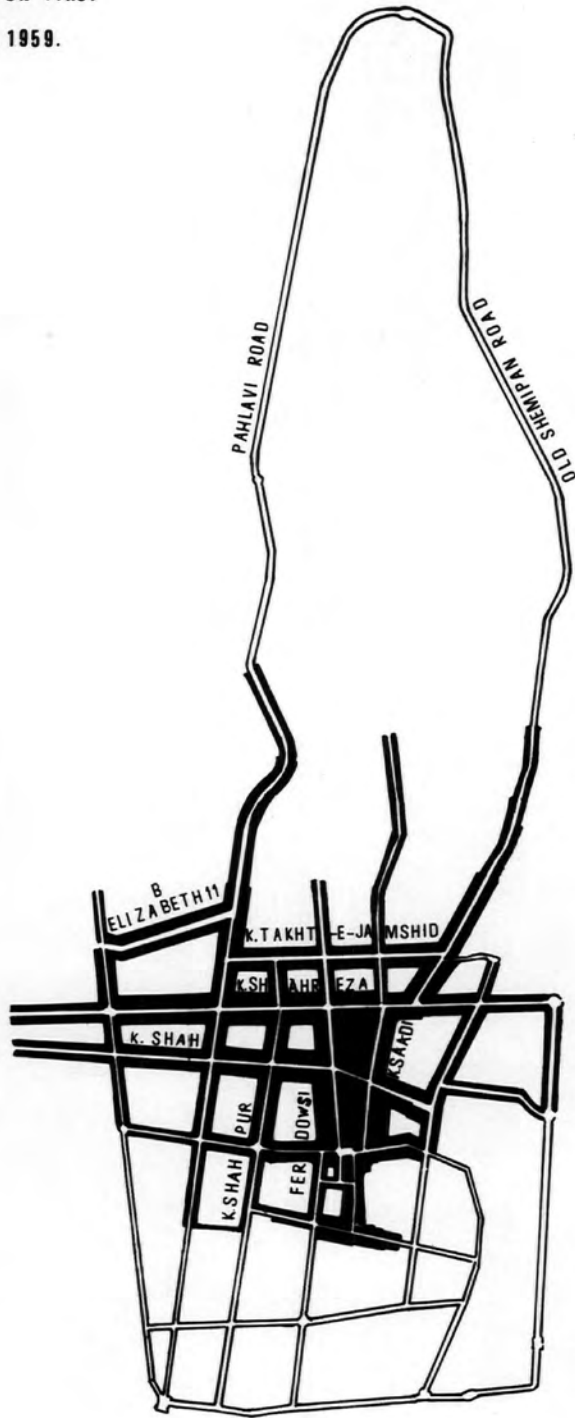
in Tehran include physical aspects especially climatic features, social prestige together with accessibility to motorable roads. Figures 6.3 and 6.4 illustrate the differences in frontal land values in Tehran in 1959 and 1971.

Until 1969, all urban land plots not less than 300 sq.m. were subject to a rate of 1 per cent per annum on their speculation value. A separate tax rate was charged on buildings over 200 sq.m. according to their area, height and construction materials. Since then, a new rate of 0.5% on the total value of buildings has been introduced for the purpose of urban renewal, assessment of total value being based on land values, area, height of property and construction materials.^{14, 15} The assessed values of the Ministry of Finance, although they may not always confirm to the actual price of land when put on the market, are fairly reliable for a generalized study of broad contrasts.

Figures 6.3 and 6.4 differ from each other in one aspect namely, that in the former, the frontal land values are calculated for a 30 m. depth whilst for the latter the figure is 25 m. However for the purpose of comparison, both figures are at the same scale and use the same land values classification. Inflationary trends have been taken into consideration, in that, taking 1959 as a base (100) and using the general index for inflation for 1971, which was 30% over the 1959 base, prices are thereby kept constant and a real indication of increases in land values is given.¹⁶

When the two maps are compared, they indicate several changes that have occurred during the past 12 years. For

FIG.6.3.FRONTAL LAND PRICES ON FIRST
THIRTY METRES OF KHIABANS, 1959.



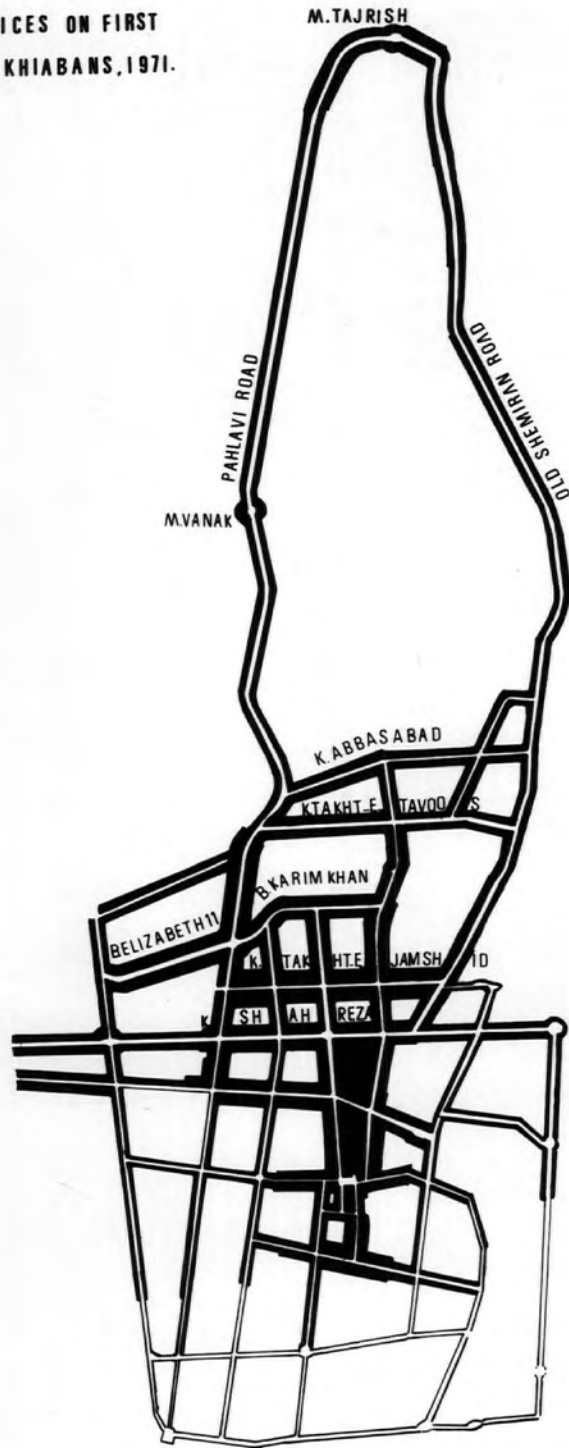
SOURCE: MINISTRY OF FINANCE.

instance a minimum four-fold increase in land values in a northerly direction has taken place during the period under consideration.¹⁷ This increase confirms a constant movement of the centre of gravity of commercial activities towards the north. As a result of such movement a visible decline in certain areas of central Tehran is quite apparent. A decrease of 1,000 Rls. per square metre on Khiaban-e-Ferdowsi (from 15,000 Rls. to 14,000 Rls.), and 2,000 Rls. on either side of Khiaban-e-Shahpur (from 7,500 Rls. to 5,500 Rls). in spite of a general increase in land values is very interesting. This decline may be attributed to several factors but particularly problems of accessibility as a result of traffic congestion and related urban problems which affect total retail sales.

In both figures, the area located between Khiaban-e-Boozarjomehri and Khiaban-e-Shahreza especially along the major Khiabans of Saadi, Lalehzar and Ferdowsi correspond with the area of highest frontal land values. In 1959, this area comprised almost the whole of Tehran's C.B.D. and produced a continuous extended area of the highest land values. The westward continuation of these high land values on either side of Khiaban-e-Shah and Khiaban-e-Shahreza also confirms the commercial importance of these Khiabans.

The diagram for 1971 shows two new centres of high land values which add a new commercial status to Tehran. This development is a direct result of a northward movement of high class families followed by the extension of the commercial area. The first centre located between Khiaban-e-Shahreza and Khiaban-e-Takht-e-Tavoos, enjoys both proximity to the city centre and accessibility to high class residential

FIG.6.4 FRONTAL LAND PRICES ON FIRST TWENTY FIVE METRES OF KHIABANS, 1971.



PRICES IN 1000 RIALS/METRE

+17 15 13 11 9 7 5 3

N

0 300 600 1500 3000mt.

SOURCE: MINISTRY OF FINANCE.

areas.

Khiaban-e-Takht-e-Jamshid, Boulevar-e-Elizabeth and Khiaban-e-Takht-e-Tavoos are the places of modern shopping centres. Khiaban-e-Takht-e-Jamshid, apart from its commercial importance, is also an area of high social prestige. This avenue falls within an area of Tehran's highest land values and a section of it between Pahlavi Cross Roads and Khiaban-e-Behjatabad has land values rising to a maximum of 18,000 Rls. per sq.m. which is equal to Khiaban-e-Istanbul, the peak value point of the C.B.D. of Tehran (Fig. 6.4).

Maidan-e-Tajrish is the second new area of high land values, for it functions as a local market for the whole of Shemiran. The area located between the two centres mentioned, is characterized by commercial ribbon development with relatively high frontal values.

In conclusion, an absolute decline of land values in the Central Area of Tehran appears to be likely to continue. Evidence has already been suggested illustrating this trend. In addition, relative decline is marked by the rather stagnant pattern of frontal land values for most of the khiabans, compared with the significant rise in such values to the north of Khiaban-e-Shahreza. This latter development is a feature of the northward movement of the city's commercial centre of gravity which again is a direct result of the northward movement of high class Tehranis towards Shemiran. Here, interior and frontal land values are both relatively high as both are easily accessible to public utilities and transport because of the fairly well planned nature

of their sites. The converse is true in central, and parts of, southern Tehran. The range of difference between the interior and frontal land values is very high in the central area. Frontal areas enjoy maximum accessibility for the commercial functions they perform, whilst the interior blocks tend to coincide with the older more inaccessible city core. Inaccessibility as a result of long and narrow Kuchehs and Cul-de-sacs, together with a high degree of population congestion affects these interior land values. To the south the range of difference between frontal and interior land values is low as general land values overall are low. This overall contrast between the frontal and interior land values of different parts of Tehran is likely to be a continuing trend in any future analysis of the city's land use patterns.

CHAPTER 6 - Notes and References

1. 'Iranian Civic Law', article No. 141,142.
2. Ragheb, I. 'Patterns of Urban Growth in the Middle East' in The City in Newly Developing Countries, ed. G. Breeze 1969, P.122.
3. Municipality of Tehran. 'Survey on the housing of Tehran for the purpose of Renewal tax. 1966.
4. First National Census, Tehran, 1956, Vol. 2, P.x and 1966, Vol. x, p.q.
5. This refers to the 'Comprehensive Plan for Tehran', produced by A.A. Farman Farmaian in two stages (1 and 2) and is a 25 years (1966-1991) planning programme to control the development and expansion of City of Tehran.
6. Municipality of Tehran. 'Summary Report on the activities of the Tehran's Municipality in 1349 (1970)', Bulletin of Tehran Municipality, 1349 (1970) P.5. (Farsi)
7. Ibid, P.18
8. Ministry of Labour and Social Affairs op.cit. 1969, p.75.
9. 'Atlas of Tehran'. op.cit. 1969, P.75.
10. This ratio is calculated from the figures given by the Atlas of Tehran for 1969.
11. Atlas of Tehran. op.cit. 1969, P.47.
12. Murphy, R.E. 'Delimiting the C.B.D.', Economic Geography, 1954, P.190, Vol. 30, No. 30
13. Vieille, P. 'Marche des Terrains et Societe Urbaine recherche sur la ville de Tehran' Paris, 1970 P.97.
14. Ministry of Finance, Finance Agency of Tehran, 'the index value of lands and buildings of the Tehran area and surroundings. (1959) 1333, (Farsi) Pp.7-88.
15. Ibid, 'The speculation values of land and buildings of Tehran and Shemiran, (Farsi) 1350 (1971), Pp. 1-208.
16. Bank Markazi (Central Bank). Cost of living Annual Average index. 1971.
17. In this area land prices have boomed under the manipulation of profit seekers. For instance the land price on the frontage of Khiaban-e-Roosevelt between Khiaban-e-Takht-e-Jamshid and Takht-e-Tavoos rose from 3,000 rials per square metre in 1959 to 4,000 in 1965, 10,000 in 1969 and by 1971 it had risen to 12,000 rials.

C O N C L U S I O N

Having analysed many aspects of the urban geography of Tehran, it is now possible to draw various conclusions and suggest some of the major urban developments in the future.

Clearly of great significance is the location of Tehran and the physical attributes which favour city expansion in certain directions leading to contrasting patterns emerging which have affected, and been affected by, every aspect of social, economic and political development within the city. The contrasts between the southern and northern parts of the city in demographic characteristics income and social status are obvious examples which immediately spring to mind.

Historical factors in turn have also played a considerable role in the functional and spatial development of the city. The selection of Tehran by the Qajars as their capital city planted the seeds which are now bearing fruits for as the centre of government trade, commerce and industry in a centralized system of government it receives more than its fair share of investment.

A very high rate of growth of population is a direct result of the absorption of a large in-flow of migrants the rate of increase for the city being 6% whereas for the rest of the country it is only 2.5%. In fact about half of the city's population consists of immigrants. This theme is emphasized when it is realized that Tehran has a lower rate of natural increase compared with the rest of

the country. Accepting an estimated growth rate of 6% for the 1956-66 intercensal period, it can be assumed that the population of Tehran will have doubled to reach 6 million by 1980., 12 million by 1990 all other factors being equal. Existing limitations and barriers to expansion such as water and housing shortage and traffic congestion are amongst factors which in theory should inhibit further rapid increase of the city's population and are major reasons favouring the initiation of restrictive measures to limit population growth within the metropolitan area. The Comprehensive Plan for Tehran has been produced mainly to guide and control this rapid expansion. Control measures can be summarized in three broad categories. Firstly the increase of population by migration from the rest of the country will it is hoped be reduced by the creation of Economic growth poles in selected provincial cities such as Tabriz, Arak, and Esfahan from which Tehran received the grēatest number of migrants. To this end the Central Government are investing heavily in industry and infrastructure and also simulating private investment by taxation and other fiscal measures. As a linked policy legislation has been introduced which prevents the building of any major basic industrial premises within 120 kilometres of the city boundary. The second measure consists of the introduction of various methods of family planning as a means of decreasing the birth rate. Finally it is hoped that after 1980 a decrease in the attraction of the capital city together with the concomitant increase in the attraction of other provincial cities will result in a 1 to 1.5% per annum

decrease in the total population through emigration although for stronger legislation than exists at the moment will be necessary to enforce such a laudable aim. The Master Plan for Tehran does not envisage a population in excess of 5.5 million in 1991 although an increase in life expectancy as a result of improved medical facilities must be born in mind in any forecasts by the government planners.

The gradual depopulation of the city core and Central Area shows a new trend of population movement towards the periphery of the city similar to that found in western cities. This rapid increase in the population is reflected in the ever increasing demand for such requirements as electricity and water which from a supply cost point of view are aggravated by the physical expansion of the city with supply not coping with demand. Problems of housing, transportation, employment, education and leisure are all matters of immediate concern. One of the more obvious examples is the considerable demand for housing produced by the increase in population. This can be supported by the fact that in 1966, 40% of the housing units of Tehran were built between 1956 and 1966. The problems of slum clearance and rehousing must become more important in government schemes in the provision of facilities for the growing population. It is estimated that £400 per person is required for a typical urban renewal scheme within the Central Area. This is a real problem which has been ignored for many years, and any plan must pay particular attention to it. Surveys have grouped housing units of the Central Area of Tehran into 5 different categories according

to their condition. These will be demolished in order and replaced by similar or higher order facilities. Government housing programmes are at last aiming to provide relatively inexpensive facilities, in reach of the working class.

As regards retailing, the linear pattern of shops along both sides of the main avenues, indicating high-way oriented development is another aspect similar to western cities. On the other hand the relatively large number of retailing units provides a contrast to western cities, and is reflected in such things as street sellers, and vast underemployment in the Tertiary sector.

The differences between income groups clearly affect land use patterns and result in the southern part of the city being characterised by a congested and poor environment with a high density of population and housing whilst in the north the obverse is only too apparent.

Increase in land values results in the replacement of lower order functions such as residential land with higher order functions such as retailing and services, a good example of this being the decline of population in the city core and Central Area of Tehran. Since the price of land is a controlling factor, the location of higher order function is more general in areas of high as opposed to low land prices.

Rapid expansion of the city to a position of pre-eminence in Iran with an important international standing has been accompanied by the consequent multiplying of problems within the urban environment. Tehran, although

unique in Iran, can-not be taken out of context and problems being faced by planners in the capital city will be problems for many provincial cities in the not too distant future. An effective planning agency backed by a willing executive is producing significant solutions to the problems of congestion in all spheres of urban life but in the face of such rapid development of the city it is hardly surprising that the task is onerous. To fulfil its aims the government has to counteract the supremacy of Tehran as well as maintain standards of living. Decentralization is an immediate concern and is being pursued vigorously. Capital and resources concentrated in Tehran are being fed into the provinces resulting in a rise in the standards of living in outlying areas and in a greater degree of communication between the capital and the nation, the product of which will hopefully be a decentralized nation without the capital being classified apart from the nation as a whole.

It is hoped that the above pages have analysed some of the major urban characteristics of Tehran and demonstrated some of the problems involved yet at the same time pointed in directions which may well prove fruitful for the over-all development of the city and the nation.

APPENDIX 1

Estimates of the Population of Tehran 1627 - 1971

Della Valle	1627		15,000
Herbert	1627	Houses 3,000	15,000-30,000
Olivier	1796		15,000
"	1807		50,000
Gardane	1807		50,000
Dupre	1807		45-50,000
Marier	1809		60,000
Ouseley	1810		40-60,000
Kinneir	1813		60,000
Tancoigne	1820		45-50,000
Ker Porter	1821		60-70,000
Briand	1829		50,000
Sercey	1839		60,000
Flandin	1840	less than	100,000
Dubeux	1841		130,000
Stuart	1854		40,000
Sheil	1856		80,000
Binning	1856		80-90,000
Brugsch	1860		100,000
Eastwick	1864		100,000
Ussher	1865	less than	100,000
Macgregor	1871		60-70,000
Basset	1872		120,000
Mounsey	1872		120,000
Goldsmith	1874		100,000
Ballantine	1875		80,000
Arnold	1877	50,000 or	80,000
Serena	1877		200,000
Basset	1884		200,000
Orsolle	1885		150,000
Brugsch	1886		100,000
Benjamin	1887	over	100,000
Stevens	1887		180,000
Feuvrier	1889		130,000
Lemesurier	1889		150,000
Bishop	1891		160,000
Lefevre-Pontalis	1892		80,000
Curzon	1892		200-220,000
		old residents	155,000
Stineraires	1895	European estimate	190,000
		Local estimate	200,000
Wilson	1896		200,000
Bobek	1934		200,000
Stapl	1900		250,000
Wishard	1908		295,000
Bricteux	1909		300,000
Amet	1910		200,000
Fortescue	1917-18		350,000
"	1919		250,000
Bird	1921		300,000
Cyclists	1925		250,000
Hardoin	1929		300-700,000
Clapp	1930	over	200,000
Wilson	1932		310,000
Ebtehaj	1934		360,251
Bobek	1934		360,000

Filmer	1936	300,000
Vol Rosen	1937	360,000
Furon	1938	360,000
Admiralty	1939	300,000
Morton	1940	400,000
Hier et Aujourdhui	1941	699,116
Admiralty	1942 with district	540,000
Hindus	1949	750,000
Hier et Aujourdhui	1950	1,009,539
Long	1951	1,000,000
Yearbook	1953	1,500,000
Tehran Journal	1954	1,200,000
Monteil	1959	1,599,000
Oberle	1961	1,600,000
Naraghi	1971	2,350,000

After J.I. Brown. 1965.

APPENDIX 2

Selected Population Characteristics of Tehran, Rey & Shemiran 1966

Districts of Tehran	Age Group	Population	% of Total	Male %	Female %	Sex Ratio by Age Group	Sex Ratio	Dependency Ratio %
1	0-14	119,276	32.3	38.9	39.6	103.9	105.7	73.0
	15-64	175,491	57.8	58.4	57.2	107.9		
	65+	8,930	2.9	2.7	3.2	89.2		
2	0-14	44,354	27.8	27.3	28.4	100.4	104.6	50.2
	15-64	106,257	66.6	67.2	65.9	106.6		
	65+	8,941	5.6	5.5	5.7	102.0		
3	0-14	146,834	40.6	39.7	41.6	104.9	109.7	77.1
	15-64	207,172	56.5	57.4	55.4	113.8		
	65+	10,574	2.9	2.9	3.0	101.0		
4	0-14	162,953	44.5	44	45	106.5	108.8	89.3
	15-64	193,395	52.8	53.5	52.3	110.9		
	65+	9,691	2.7	2.7	2.7	108.1		
5	0-14	123,730	38.6	37.4	39.8	104.9	111.6	73.6
	15-64	184,886	57.6	58.8	65.4	116.3		
	65+	12,244	3.8	3.8	3.8	111.2		
6	0-14	114,024	45.5	45.0	46.0	104.8	105.6	91.8
	15-64	130,720	52.1	52.7	51.6	109.7		
	65+	5,911	2.4	2.3	2.4	101.7		
7	0-14	150,003	48.0	47.3	48.7	105.7	108.7	100.7
	15-64	155,859	49.8	50.5	49.0	112.0		
	65+	6,956	2.2	2.2	2.3	103.4		
8	0-14	105,828	44.5	44.2	44.8	103.5	105.1	88.3
	15-64	126,264	53.1	53.7	52.5	107.4		
	65+	5,686	2.4	2.1	2.7	86.3		
9	0-14	37,976	32.7	31.9	33.6	104.0	109.5	56.4
	15-64	74,268	63.9	65.2	62.5	114.4		
	65+	3,947	3.4	2.9	3.9	79.5		
10	0-14	108,807	42.2	41.6	42.8	104.6	107.5	83.2
	15-64	140,824	54.6	55.1	54.0	109.8		
	65+	8,329	3.2	3.2	3.2	107.5		
Tehran	0-14	1,115,727	41.0	40.7	42.1	104.7	110.1	78.6
	15-64	1,522,708	56.0	56.5	54.8	114.8		
	65+	812,95	3.0	2.8	3.1	100.6		
Shemiran	0-14	61,413	39.0	38.7	39.3	106	107.6	72.6
	15-64	91,229	57.9	58.4	57.5	109		
	65+	4,844	3.1	2.9	3.2	100		
Rey	0-14	48,406	47.1	46.2	47.9	105.1	109.1	99.7
	15-64	51,484	50.1	50.9	50.6	105.9		
	65+	2,935	2.8	2.9	2.7	117.5		

Source: Second National Census of Iran 1966, Tehran Vol. 10
 Shemiran No.13
 Rey No. 13.

APPENDIX 3

Qanats of Tehran. (See Fig. 4.9 Water resources of Tehran).

- 1- Qanat-e-Karaj or Amin-ol-Molk.
- 2- Qanat-e-Akbarabad.
- 3- Qanat-e-Najafabad.
- 4- Qanat-e-Vaziry.
- 5- Qanat-e-Baq-e-Shah.
- 6- Qanat-e-Shah.
- 7- Qanat-e-Kosariyeh or Farman Farma.
- 8- Qanat-e-Karimabad.
- 9- Qanat-e-Beryanak.
- 10- Qanat-e-Jalaliyeh.
- 11- Qanat-e-Sangalaj.
- 12- Qanat-e-Makhsos.
- 13- Qanat-e-Sefarat-e-Englis (British Embassy's Qanat).
- 14- Qanat-e-Sefarat-e-Ross (Russian Embassy's Qanat).
- 15- Qanat-e-Mehrgard.
- 16- Qanat-e-Sefarat-e-Amrica (American Embassy's Qanat).
- 17- Qanat-e-Baha-ol-Molk.
- 18- Qanat-e-Mehdiabad.
- 19- Qanat-e-Ala-ol-Doleh.
- 20- Qanat-e-Yoosefabad.
- 21- Qanat-e-Pamenar.
- 22- Qanat-e-Hajji Alireza.
- 23- Qanat-e-Baharestan.
- 24- Qanat-e-Elahiyyeh.
- 25- Qanat-e-Nezamiyeh.
- 26- Qanat-e-Sardar.

APPENDIX 3.A

Location of major wells of Tehran. (See Fig. 4.9)..

- 1- Maidan-e-Shoosh.
- 2- Maidan-e-Mohammadiyeh.
- 3- Chaharrah-e-Qavam-ol-Doleh.
- 4- Maidan-e-Shahpur.
- 5- Maidan-e-Qazvin.
- 6- Chaharrah-e-Abbasi.
- 7- Atash Neshani. (Fire Station).
- 8- Park-e-Shahr. (City Park).
- 9- Maidan-e-Shah.
- 10- Maidan-e-Syrus.
- 11- Khiaban-e-Emanzadeh Hasan.
- 12- Dabestan-e-Saadi. (Saadi School).
- 13- Shomal-e-Bank-e-Sepah. (North of Sepah Bank).
- 14- Maidan-e-Ferdowsi.
- 15- Maidan-e-Fooziyeh.(Shahmaz).
- 16- Maidan-e-Darvazeh Shemiran.
- 17- Maidan-e-Jaleh.
- 18- Khiaban-e-Rohat Karim.
- 19- Jolo-ye-Moozeh. (In front of Archeological Museum).
- 20- Maidan-e-Mokhber-ol-Doleh.
- 21- Khiaban-e-Goteh.
- 22- Maidan-e-Baharestan.
- 23- Baq-e-Shah.

Chaharrah = Cross Road.

Darvazeh = Gate.

Khiaban = Street.

Maidan = Square.

APPENDIX 4

Methodology and Sources.

Both the size of Tehran and approach adapted in this study meant that detailed field work was not possible in all parts of the thesis. Indeed the main purpose of the study was to attempt to synthesize the major published and unpublished sources of data covering Tehran, and consider how these had interacted and led to patterns of growth, spatial contrasts, and distribution of activities. However in several parts of the thesis field work was undertaken to assess both the validity of published sources and modifications and additions to functional elements particularly in the Central part of the city and the rapidly expanding peripheral areas.

While the author^{was} attached to the Institute of Geography of Tehran University from 1966 as a research assistant, field work was carried out ^{through} the Institute in the industrial zones along the Karaj and Mazandaran roads to assess type and size of industrial establishments. Other personal field projects were carried out especially into the expansion of peripheral residential areas, in the north-west, north-east and south-west of Tehran.

Published materials, books, articles, official censuses and statistics together with some unpublished data recorded in the Municipality of Tehran formed the major sources of the first three chapters. Nevertheless, the nature of these sources are sometimes fairly generalized,

or prepared to meet the demands of particular government offices. Considerable time and careful study was required for adaptation and adjustment of such data. In the case of chapter three, mainly the product of available published and unpublished sources (except for figure 3.2 copied from an original work, and figure 3.5, a photograph of an official map), other figures are the result of considerable calculations and combinations from several sources, obtained from the Statistical Centre of Iran, the Municipality of Tehran, the Institute for Social Studies and Research, Plan Organization of Iran, and the Ministry of the Interior and the Department of Civil Registration and Statistics of Tehran. In the case of chapter four, personal field work contributed to knowledge of such activities as wholesaling, selected services, industrial activity, and water supply. Two months before departing for England research work was being geared specifically to obtaining information for this dissertation through personal observation and through data collection from the various sources.

BIBLIOGRAPHY

1. Abdol Gaffar Najm-ul-Mulk, Map of Tehran, 1309 A.H. (1891)
2. Adl, A.H. Climate of Iran, University of Tehran, Publication No. 626, Tehran, 1960.
3. Ahrens, P.G. Die Entwicklung der Stadt Tehran.
Eine Stadliche Untersuchung ihrer zukunfftgen Gest altung
Oplanden, e.w. Leske, 1966.
4. Amani M.H. Fecondite actuelle des femmes mariees dans
quatre zones rurales d'Iran in Some Demographic
Aspects of the Population of Iran, Institute for Social
Studies and Research, Tehran, 1968.
5. Amani M.H. Religious Groups in Iran. Tehran, 1966.
6. Amuzegar, J. Technical Assistance in Theory and Practice:
The Case of Iran. F.A. Praeger, New York, 1965.
7. Arid Zone Research Centre, Iranian Rainfall Data,
Publication No. 3, Tehran, 1960.
8. Avery, P.W. Modern Iran, London, 1966.
9. Bailey, E.B., Jones, R.C.B. and Asfia, S. 'Notes on the
Geology of the Elburz Mountains North-east of Tehran',
Iran, Q.Jl. Geolo. Soc. Vol. CIV, London, 1948.
10. Baldwin, G.B. Planning and Development in Iran,
John Hopkins Press, Baltimore, 1966.
11. Banani, A. The Modernization of Iran, 1921-1941,
Stanford University Press, Stanford, 1961.
12. Bartsch, W.H. and Bharier, J. The Economy of Iran,
1940-1970. a Bibliography. University of Durham, Centre

for Middle Eastern and Islamic Studies, Publication No. 2, Durham, 1971.

13. Bayne, E.A. 'Changing Tehran', A.U.F.S. Reports, S.W. Asia Series, No. 10 (2) May 1961.
14. Beaumont, P. 'Qanat System in Iran', Bulletin of the International Association of Scientific Hydrology, XVI, I. 3. 1971.
15. Beghin, B. 'De Teheran a Karaj', Journal de Geneve, 10, Nov. 1959.
16. Behnam, J. 'Population of Iran', in The Land of Iran. ed. W.B. Fisher, Cambridge University, Cambridge, 1968.
17. Behnam, J. 'Population Policy and Family Planning in Iran', in Some Demographic Aspects of the Population of Iran. Institute for Social Studies and Research, Tehran, 1968.
18. Benedick, R.E. Industrial Finance in Iran. 1964.
19. Berry, B.J.L. 'City size distribution and economic development', Economic Development and Cultural Change, Vol. 9, 1961.
20. Berry, B.J.L. Geography of Market Centres and Retail Distribution, Prentice Hall, 1967.
21. Bharier, J. 'A Note on the Population of Iran, 1900-1966', Population Studies, 22, 1968.
22. Bharier, J. Economic Development in Iran, 1900-70. O.U.P., London, 1971.
23. Bharier, J. 'Economic Growth in Iran', Contemporary Review, Jan. 1969. ✓

24. Bharier, J. 'The Growth of Towns and Villages in Iran, 1900-66', mimeographed article, Durham, 1971.
25. Blake, G.H. 'Urbanization in North Africa', T.E.S.G., LXII, No.3, April/May 1971.
26. Bobek, H. Feature and Formation of the Great Kavir and Masileh, Arid Zone Research Centre, Publication No.2, University of Tehran, 1959.
27. Bobek, H. 'Tehran', Geogr. Forschungen, ^{Schlern} Schriften, Band 190, Innsbruck, Wagner, 1958.
28. Breese, G. (ed) The City in Newly Developing Countries. Readings on Urbanism and Urbanization, Modernization of Traditional Societies Series, Prentice Hall, 1969.
29. Breese, G. Urbanization in Newly Developing Countries. Prentice Hall, 1966.
30. Brice, W.C. South-West Asia. University of London Press, London, 1966.
31. Brown, J.A. A Geographical Study of the Evolution of the Cities of Tehran and Isfahan. Unpublished Ph.D. thesis, Department of Geography, University of Durham, 1965.
32. Burgess, E.W. 'The Growth of the City', in R.E. Park et al. (eds.) The City. Chicago, 1925.
33. Carter, H. and Davies, W.K.D. (eds.) Urban Essays: Studies in the Geography of Wales. London, 1970.
34. Carver, H. Cities in the Suburbs. University of Toronto Press, 1962.
35. Chapin, F.S. Urban Land Use Planning, University of Illinois Press, Urbana, 1965.

36. Chasteland, J.C., Amani, M.H., and Puach, D.A.
Projections de la Population de Teheran de 1956 a 1991. Institute D'Etudes et de Recherches Sociales, Tehran, 1966.

37. Chorley, R.J., and Haggett, P. Socio-Economic Models in Geography. Methuen & Co., London, 1969.

38. Clapp, F.G. 'Tehran and Elburz', Geographical Review, Vol. xx, 1930.

39. Clark, B.D. 'Iran: Changing Population Patterns', in Population Geography of Middle East and North Africa, J.I. Clarke, and W.B. Fisher (eds.) 1972.

40. Clark, B.D. 'Problems of Urban Research in Iran', I.B.G. Seminar, Durham, 1967.

41. Clarke, C. 'Urban Population Densities', Journal of the Royal Statistical Society, Series A, 114, 1951.

42. Clarke, J.I. The Iranian City of Shiraz. Department of Geography, University of Durham, Research Papers Series, No. 7, 1963.

43. Clarke, J.I., and Clark, B.D. Kermanshah, An Iranian Provincial City. University of Durham, Centre for Middle Eastern and Islamic Studies, Publication No. 1, Department of Geography, Research Papers Series, No. 10, 1969.

44. Clarke, J.I. 'Persons per room - an Index of Population Density', Tidjschrift Voor Economie en Soc., 51, No. 10, 1960.

45. Clarke, J.I. Population Geography. Pergamon Press, 1968.

46. Clarke, J.I. "Population Geography and the Developing Countries". Pergamon Press, London, 1971.
47. Clarke, J.I., and Fisher, W.B. (eds.) "Population of the Middle East and North Africa", 1972.
48. Clavijo, Don Roy de, "Embassy to Tamerlane". translated by Le Strange, London, 1928.
49. Colby, C.C. 'Centrifugal and Centripetal Forces in Urban Geography', Annals of the Association of American Geographers, Vol. 23, March 1933.
50. Connell, J. (ed.) Semnan: Persian City and Region, University College London, Expedition to Iran, 1969. Department of Geography, University College, London 1970.
51. Coral, H. 'The Hierarchy of Central Functions within the City', in Annals of the Association of American Geographers, vol. 50 no. 4 Dec. 1960.
52. Costello, V. "Settlement Relations in the City and Region of Kashan". Unpublished Ph.D. thesis, Department of Geography, University of Durham, 1971.
53. Cressey, G.B. "Crossroads: Land and Life in South-West Asia", Chicago, 1960.
54. Gurzon, H.G. "Persia and the Persian Question". 2 Vols., London, 1892.
55. Degardi, P. 'Due Capitali Nella Steppa: Ankara et Tehran', Rivista Geografica Italiana, Vol. 70, No. 3, 1963, (with English Summary).
56. Darwent, D.F. "Urban Growth in Relationship to Socio-Economic Development and Westernization. A Case Study"

- of the City of Mashhad, Unpublished Ph.D. thesis,
Department of Geography, University of Durham, 1965.
57. Della Valle, Pietro, Voyages, Trans. Coulon and
Clouzier. Suite. Paris, 1664.
58. Dickinson, R.E. The West European City, London, 1961.
59. Dresh, J. 'Le Piedmont de Teheran', Bull. de l'Assoc.
de Geographes Francais, Nos. 284-5, Mai-Juin 1959.
60. English, P.W. City and Village in Iran, University of
Wisconsin Press, 1966.
61. Farman Farmaian, A.A., et al., Comprehensive Plan
for Tehran, Imperial Government of Iran, Plan
Organization of Iran, 7 Vols., 1966.
62. Firoozi, F. 'Iranian Census 1956 and 1966: A Comparative
Analysis', Middle East Journal, 24, 2, Spring 1970.
63. Fisher, W.B. (ed) The Land of Iran, Cambridge History of Iran,
Vol. I, Cambridge University Press, 1968.
64. Fisher, W.B. The Middle East - a Physical, Social, and
Regional Geography. 6th Edition, Methuen Ltd.,
London, 1971.
65. Freeman, T.W. Geography and Planning, Hutchinson
University Library, London, 1967.
66. Ganji, M.H. 'Climate of Iran', in The Land of Iran,
ed. W.B. Fisher, Cambridge, 1968.
67. Garnier, J.B., and Chabot, G. Urban Geography.
Longmans, 1967.
68. Gentsburg, N. Atlas of Economic Development.
Chicago, 1960.

69. Gibbs, J.P. (ed.) Urban Research Methods . Princeton, 1961.
70. Gordon, A.H., and Lackwood, J.G. Weather, Vol. 25, No. 1, January 1970,
71. Hamdullah Mustoufi, The Geographical Part of the Nuzhat-al-Qulub , ed. G. Le Strange, London, Leyden, 1919.
72. Hauser, P.M., and Schmore, L.F. (eds.) The Study of Urbanization , New York, 1966.
73. Herbert, T. Travels in Persia . Ed. Sir William Foster, London, 1928.
74. Hombly, G. 'An Introduction to the Economic Organization of early Qajar Iran', Journal of the British Institute of Persian Studies, Vol. 2, 1964.
75. Hoyt, H. 'The Structure and Growth of Residential Neighbourhoods in American Cities', in Readings in Urban Geography, H.M. Mayer and F.K. Clyde, 1963.
76. Ibn-e-Balkhy, Farsnameh , ed. G. Le Strange, E.J.W. Gibbs Memorial Series, London, 1921. (Farsi)
77. Institute of Geography, University of Tehran, Climatic Atlas of Iran . Tehran, 1968.
78. Institute for Social Studies and Research, University of Tehran.
- a) Industrial Survey on the manufacturing establishments of Tehran . 1964. (farsi)
 - b) Atlas of Tehran , Tehran, 1969. (farsi)
 - c) Social Problems of Tehran . Collection of Seminars on different aspects. Pub. No. 22, Research No. 1, Tehran, 1962. (farsi)

79. The Imperial Government of Iran, Plan Organization,
"Fourth National Development Plan, 1968-72".
 Tehran, 1969.
80. Iran Almanac. 8th, 9th, and 10th Editions, 1968-71.
81. Iran National Tourist Organization, (I.N.T.O.), Iran
 Tourist statistics, "Hotels in Iran by Class".
 Report No. 6, 1967. (farsi)
82. Iran Statistical Centre:
 a) "National Census of Population and Housing", 1966.
Vol. No. 3 - Rey Shahrestan.
Vol. No.10 - Tehran Shahrestan.
Vol. No.13 - Shemran Shahrestan.
Vol. No.168- National Summary.
 b) "Enumeration District Map of Tehran" (scale 1:10,000)
 unpublished, 1966.
 c) "Statistical Yearbook". 1966 and 1968.
83. Itemad-ul-Saltaneh, Muhammad Hasan Khan, "Merat-al-
 Buldan", 4 Vols. (farsi). 1294-37 A.H. (1886-1869)
84. Jackson, A.V. Williams, "Perisa Past and Present".
 Macmillan, London, 1906.
85. Jefferson, M. "The Law of the Primate City", American
 Geographical Review, Vol. 29, No. 2, 1939.
86. Johnson, J.H. "Urban Geography, An Introductory
 Analysis". Pergammon, London, 1967.
87. Jones, E. "The City in Geography". London, 1963.
88. Jones, S. "Towns and Cities". O.U.P., 1966.
89. Kamerschen, D.R. "An Operational Index of Overpopulation",
Economic Development and Cultural Change, Vol. 13,
 No. 2, January 1965.

90. Kariman, H. "Rey-e-Bastan", Tehran 1345, (1966) (farsi).
91. Keyhan, M. Jografya-ye-Mofassal-e-Iran, Vol. 2, Tehran, 1311, (1932), (farsi).
92. Khosravi, K. 'The evolution of population and morphology of Tehran', Sokhan Magazine, Nos. 3 & 8, Tehran, 1344, (1965), (farsi).
93. Kinnier, J.M. Geographical Memoir of the Persian Empire, London, 1813.
94. Lapidus, I.M. "Middle Eastern Cities". A Symposium on Ancient, Islamic, and Contemporary Middle Eastern Urbanism, University of California Press, Berkeley and Los Angeles, 1969.
95. Le Strange, G. "The Lands of the Eastern Caliphate". Cambridge, 1930.
96. Lockhart, L. "Famous Cities of Iran". London, 1939.
97. Lockhart, L. "Persian Cities". London, 1960.
98. Mayer, H.M., and Kohn, C.F. (eds.) "Readings in Urban Geography", University of Chicago Press, Chicago 1963.
99. Melamid, A. 'Communications, Transport, Retail Trade in Iran', in The Land of Iran, Ed. W.B. Fisher, Cambridge, 1968.
100. Ministry of Economy;
- a) "16 Large Factories with over 1000 Labour Force". General Department of Commercial Statistics, Tehran, 1965.
 - b) "Directory of Large Industrial Establishments and Mines of Iran". Bureau of Statistics, 1967.
 - c) "Survey of the Internal Trade of Iran". Publication No. 19, Bureau of Statistics, Tehran, 1965.

- d) The 500 Greater Factories. Tehran, 1968.
101. Ministry of Finance, Finance Agency of Tehran,
The Index Value of Lands and Buildings of Tehran
area and Surrounding, 1338, (1959), (farsi). and 1971.
102. Ministry of Housing and Development, Report on
Measurement of Developing Activities, Tehran,
March 1968.
103. Ministry of Interior, General Department of Public
Statistics:
- a) Report on the Industrial Census of Iran,
Mordad 1342. (August 1963).
(i) Series 1.2, Vol. 13, Central Ostan,
(excluding Tehran District).
(ii) Series 1.2, Vol. 14, Tehran District.
- b) Census District Statistics of the First National
Census of Iran, Vol. 2, Tehran Census District,
Aban 1335, (Nov. 1956).
- c) Enumeration Districts Map of Tehran, (scale,
1:5000) unpublished, 1956.
104. Ministry of Labour and Social Affairs, General
Department of Man Power:
- a) Preliminary Census Results of Iranian Workplaces,
No. 1, Tehran, 1968, (farsi).
- b) Census Results of Workplaces and Workforces,
Vol. 10, Tehran, 1969.
105. Ministry of Labour and Social Affairs, General
Department of Statistics, Summary of Basic
Statistics of workplaces for 212 Iranian Cities.
1970.
106. Ministry of Roads, Iranian Meteorological Department,
Meteorological Yearbook. 1959 to 1968.
107. Ministry of Training and Education, Bureau of
Statistics, Number of Schools and Students. 1967.

108. Minorsky, V. Tehran, Capital of Persia.
Encyclopedic of Islam, Vol. 11, 1934.
109. Monkhouse, F.J., and Wilkinson, H.R. Maps and Diagrams; their compilation and construction.
London, 1971.
110. Mumford, L. The City in History. London, 1961.
111. Mumford, L. The Culture of Cities. London, 1940.
112. Municipality of Tehran, "Summary Report on the Activities of Tehran's Municipality in 1349 (1970)" Bulletin of Tehran's Municipality, 1349, (1970), (farsi).
113. Murphy, R.E., and Vance, J.E. "Delimiting the C.B.D.", Economic Geography, Vol. 30, 1954.
114. Nafisi, S. "Tarikh-e-Siasi va Ejtemai-ye-Iran".
Vol. 1, Tehran, 1345 (1966), (farsi).
115. National Cartographic Centre (N.C.C.),
a) Map of Tehran, scale 1:10,000, 1967.
b) Map of Tehran, scale 1:30,000, 1969.
c) Northern Tehran, scale 1:20,000, 1970.
116. National Iranian Airlines Corporation, Statistical Section, "Annual Report". 1968.
117. Oberle, Pl. "Tehran: La Capitale du plus Vieil Empire du Monde", Geographia, May 1961.
118. Oliver, G.A. Voyage dans l'Empire Othoman, L'egypt et La Perse. Vol. 5, Paris, 1807.
119. Overseas Technical Co-operation Agency, Government of Japan, "Report on the Urban Transportation System of Tehran". April 1970.
120. Pagnini, A.M.P. "Strutture Commercial Di Una

Citta Di Pellegrinaggio, Mashhad, Iran Nord Orientale, with English Summary, Università Degli Studi Di Trieste, Facoltà Di Economia Commercio, Institute Di Geografia, Del Bianco Edition, 1971.

121. de Planhol, X. Tehran, Institute for Social Studies and Research, Tehran, 1962.
122. de Planhol, X. 'Du Piemont Teheranais a la Caspienne. Observations sur la Geographia Humaine de l'Iran Septentrional', Bulletin de l'Association des Geographes Francais, No. 284-285, May/June 1959.
123. Plan Organization of Iran, Fourth National Development Plan, 1968-72, 1968.
124. Plan Organization, Outline of the Third Plan, 1341-46, Planning Division, Esfand 1344 (March 1965).
125. Porter, Sir R.K. Travel in Georgia, Persia, Armenia, Ancient Babylonia, etc., from 1817 to 1820, 2 Vols., London, 1821-2.
126. Ragheb, I. 'Pattern of Urban Growth in the Middle East', in The City in Newly Developing Countries, ed. G. Breese, 1969.
127. Reiben, H. Notes Preliminares sur les Terrains Alluvieux de Tehran, Arid Zone Research Centre, University of Tehran, 1960.
128. Reiben, H. 'The Geology of the Tehran Plain', American Journal of Science, 1955.
129. Schmidt, E.F. Flight over Ancient Cities of Iran, University of Chicago Press, Chicago, 1940.
130. Sjoberg, G. The Pre-industrial City, Glencoe, Illinois, 1960.

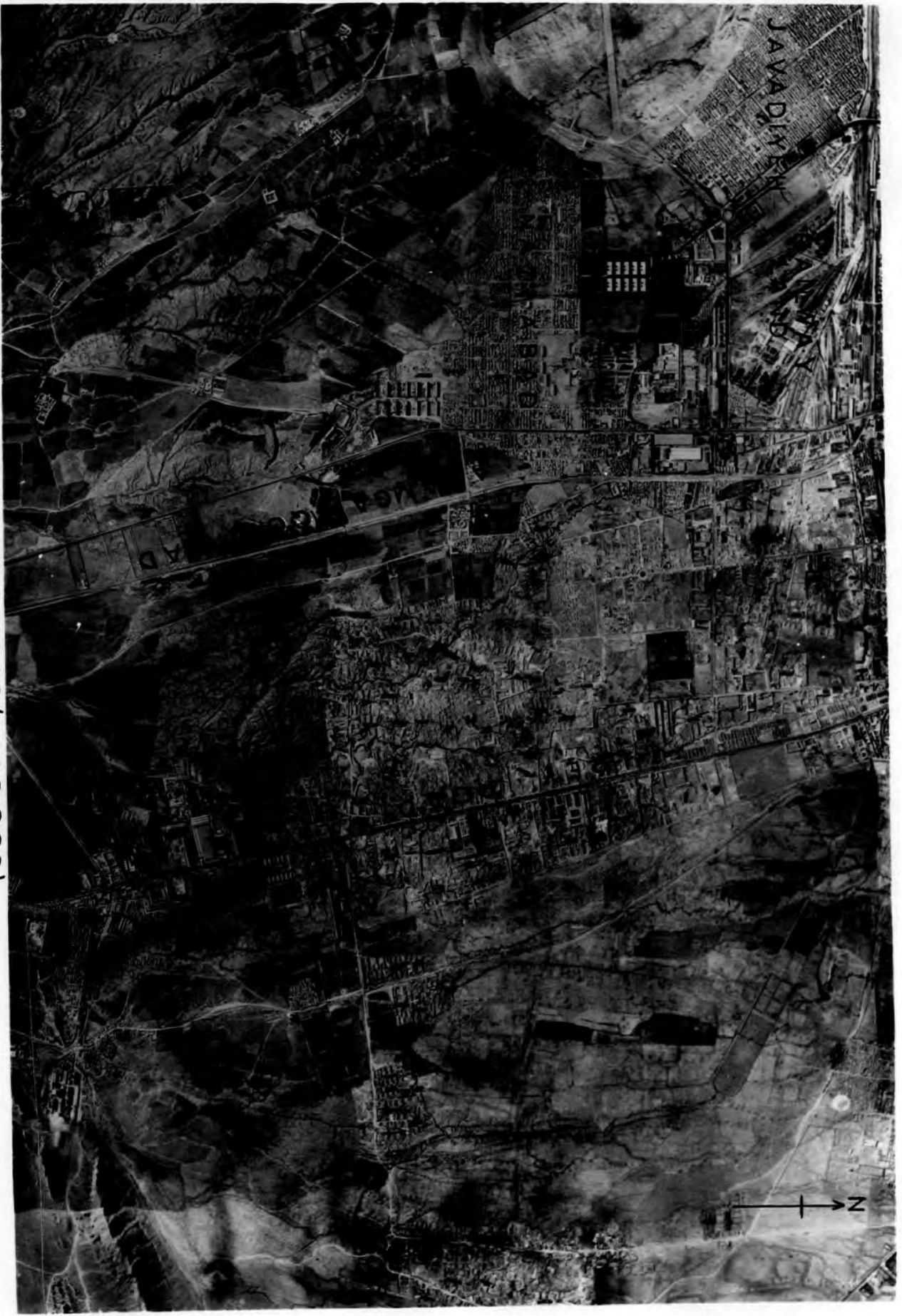
131. Smailes, A.E. "The Geography of Towns".
London, 1967.
132. Stamp, L.D. "Applied Geography". Penguin Books, 1963.
133. Swan E.P. Highlights of the 1956-66 Census of Iran.
Plan Organization, Statistical Centre, Mimeographed
report, Tehran, April 1970.
134. Tamrazian, S. Some Demographic and Sociological
Characteristics of a fast expanding City; Tehranⁿ,
in Some Demographic Aspects of the Population of
Iran, Institute for Social Studies and Research,
Tehran, 1968.
135. Thorpe, D. "The Geographer and Urban Studies".
Durham University, 1966.
136. Vadieli, K. Introduction to the Human Geography of
Iran. University of Tehran, Pub. No. 1280, 1970.
137. Valle, Viaggi Pietro Della, "La Persia et La
Persianne", ed., Venetia 1661, 8. T.I.L. ett. 4,
Brighton 1843, 1-703, Parte 2, Lettera 4.
138. Young, T.C. 'The Problem of Westernization in
Modern Iran', Middle East Journal, Vol. 2, No. 1,
Winter 1948.



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3-SOUTHERN PART OF TEHRAN, 1960(1:30,000)
SUPPLIED BY THE N.C.C., TEHRAN.



4 - WESTERN PART OF TEHRAN, 1960 (1:30,000).
SUPPLIED BY THE N.C.C., TEHRAN.



2-NORTHERN PART OF TEHRAN, 1960 (1:30,000).
SUPPLIED BY THE N.C.C., TEHRAN.

1-CENTRAL AND EASTERN PART OF TEHRAN, 1960 (1: 30,000).
SUPPLIED BY THE N.C.C., TEHRAN.

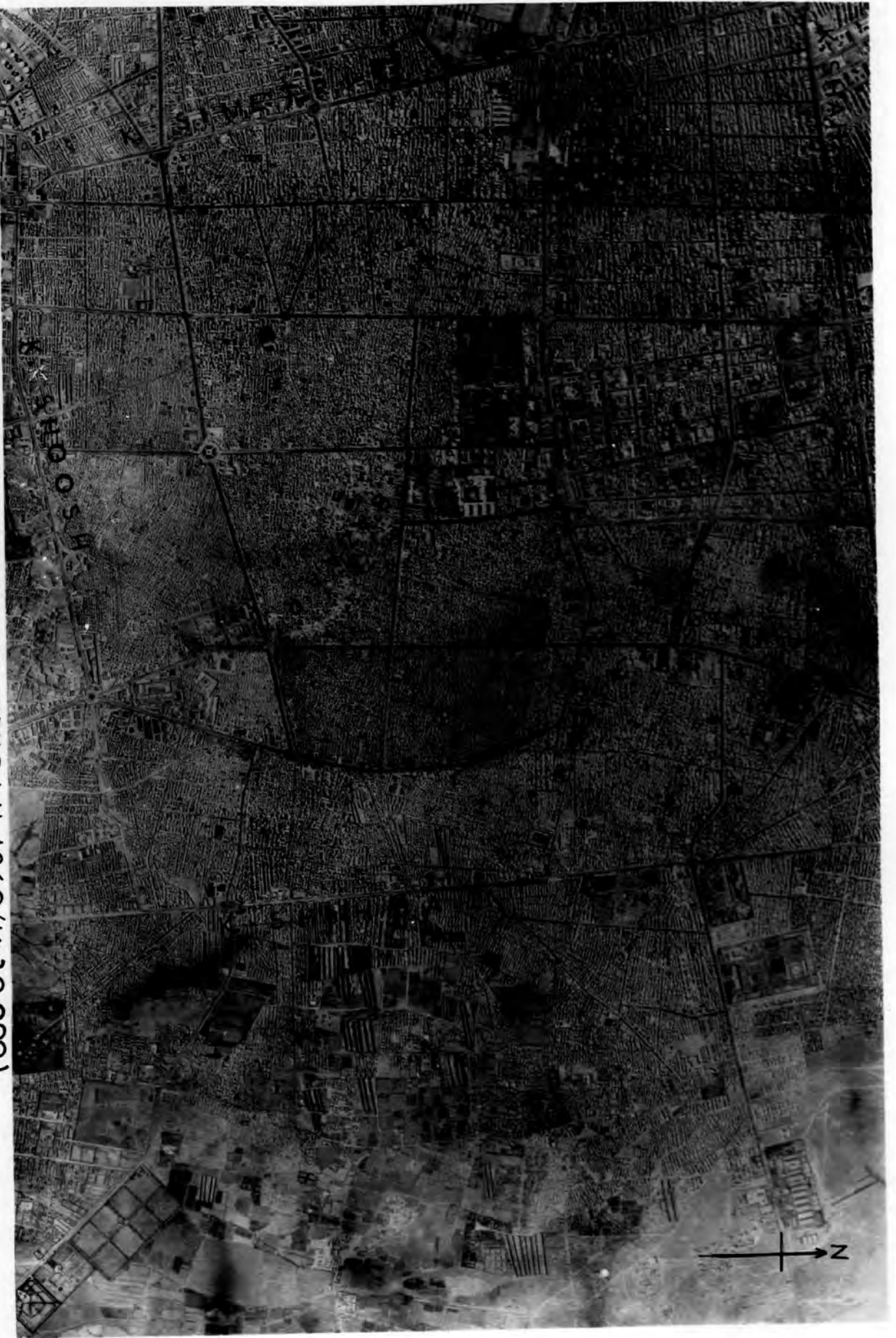
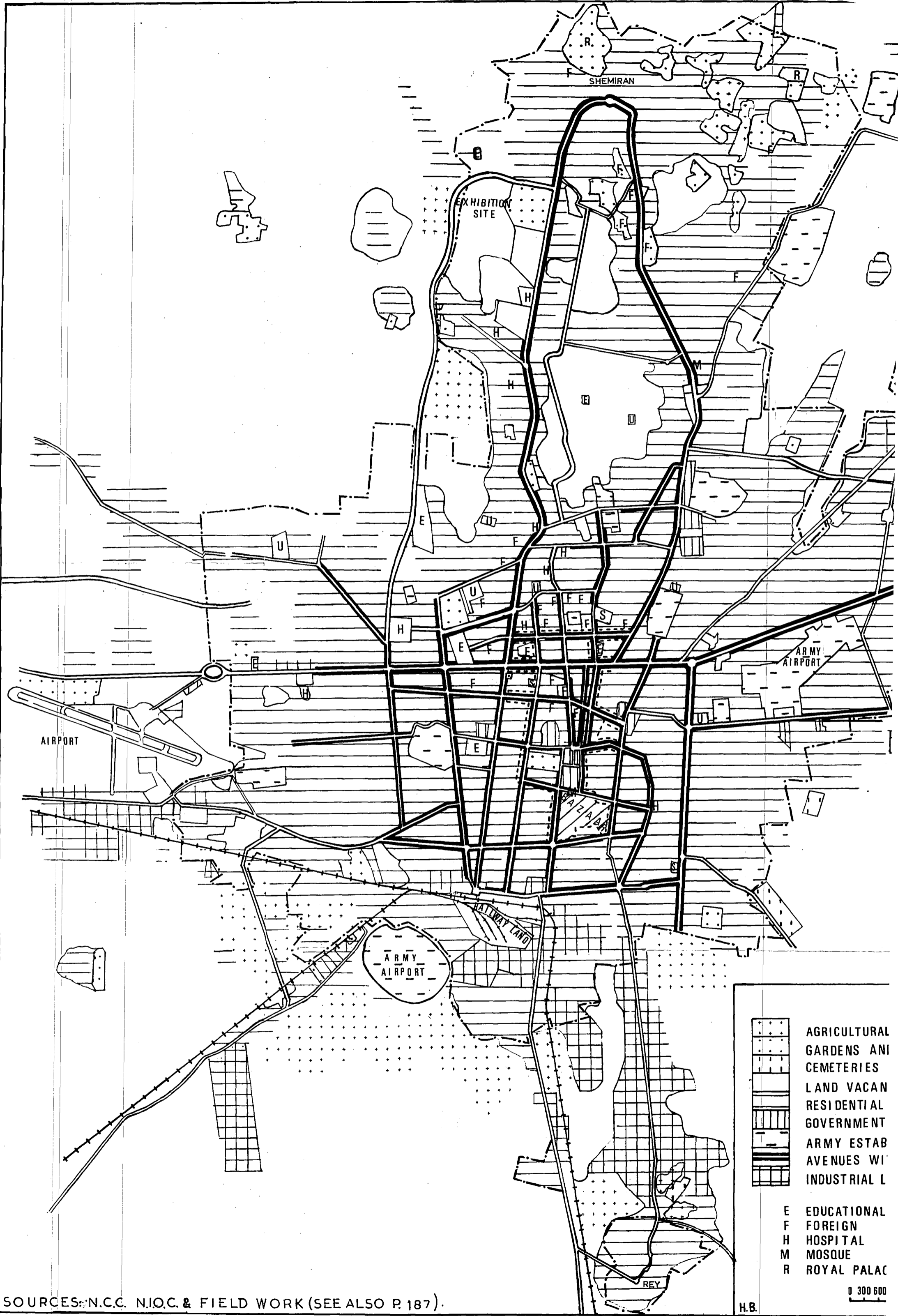


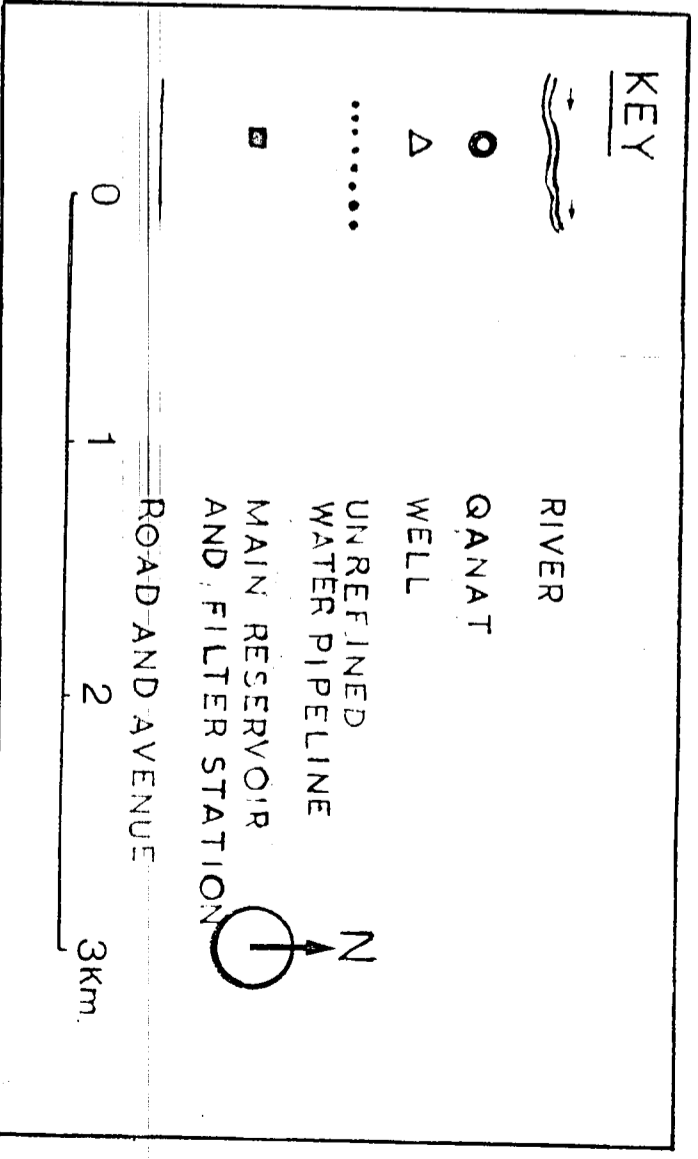
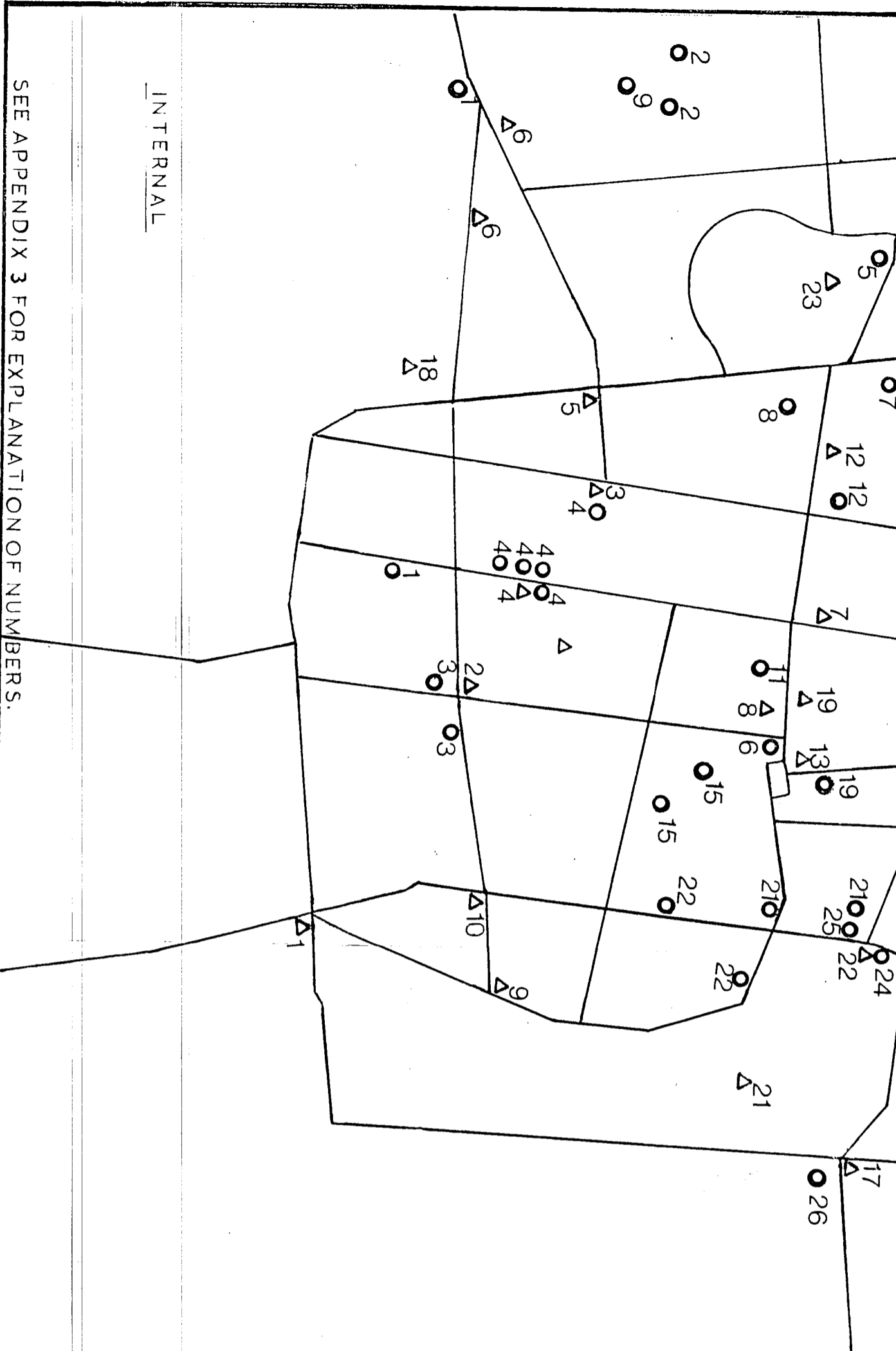
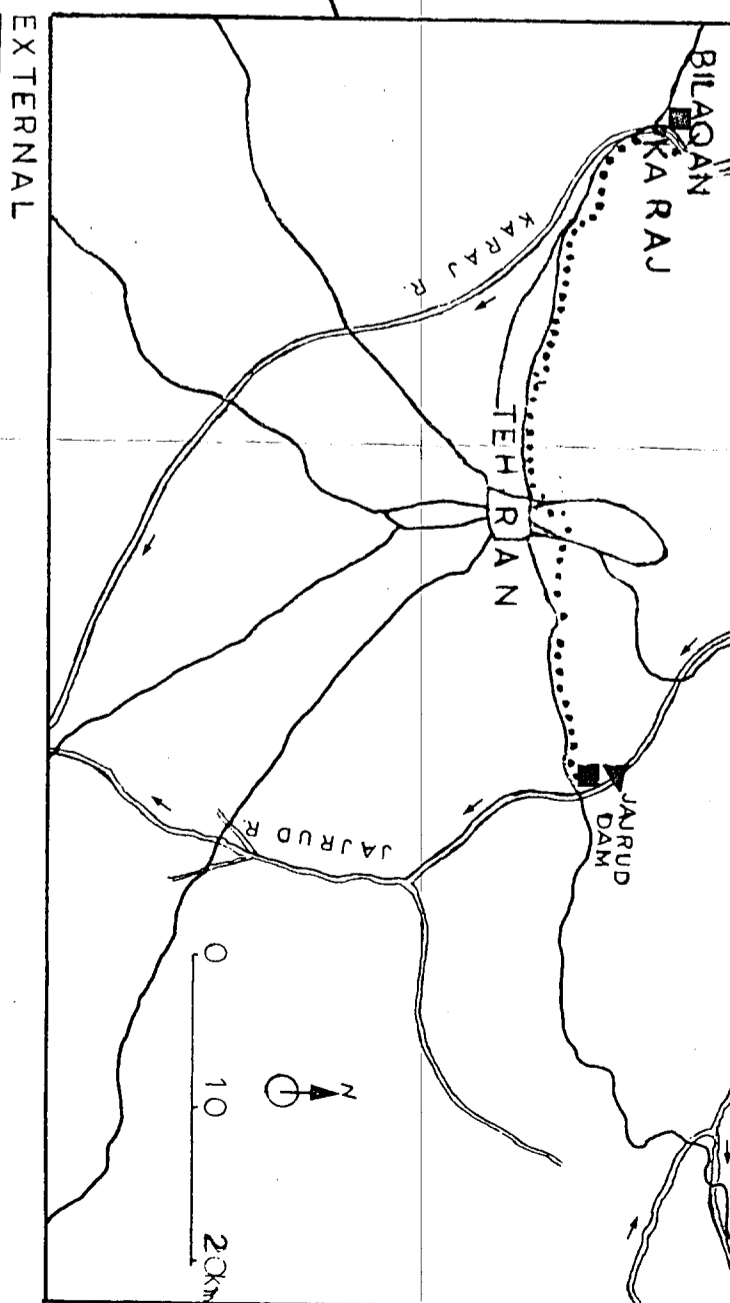
FIG.6.1 EXISTING LAND USE MAP OF TEHRAN,1970



SOURCES: N.C.C. N.I.O.C. & FIELD WORK (SEE ALSO P.187).

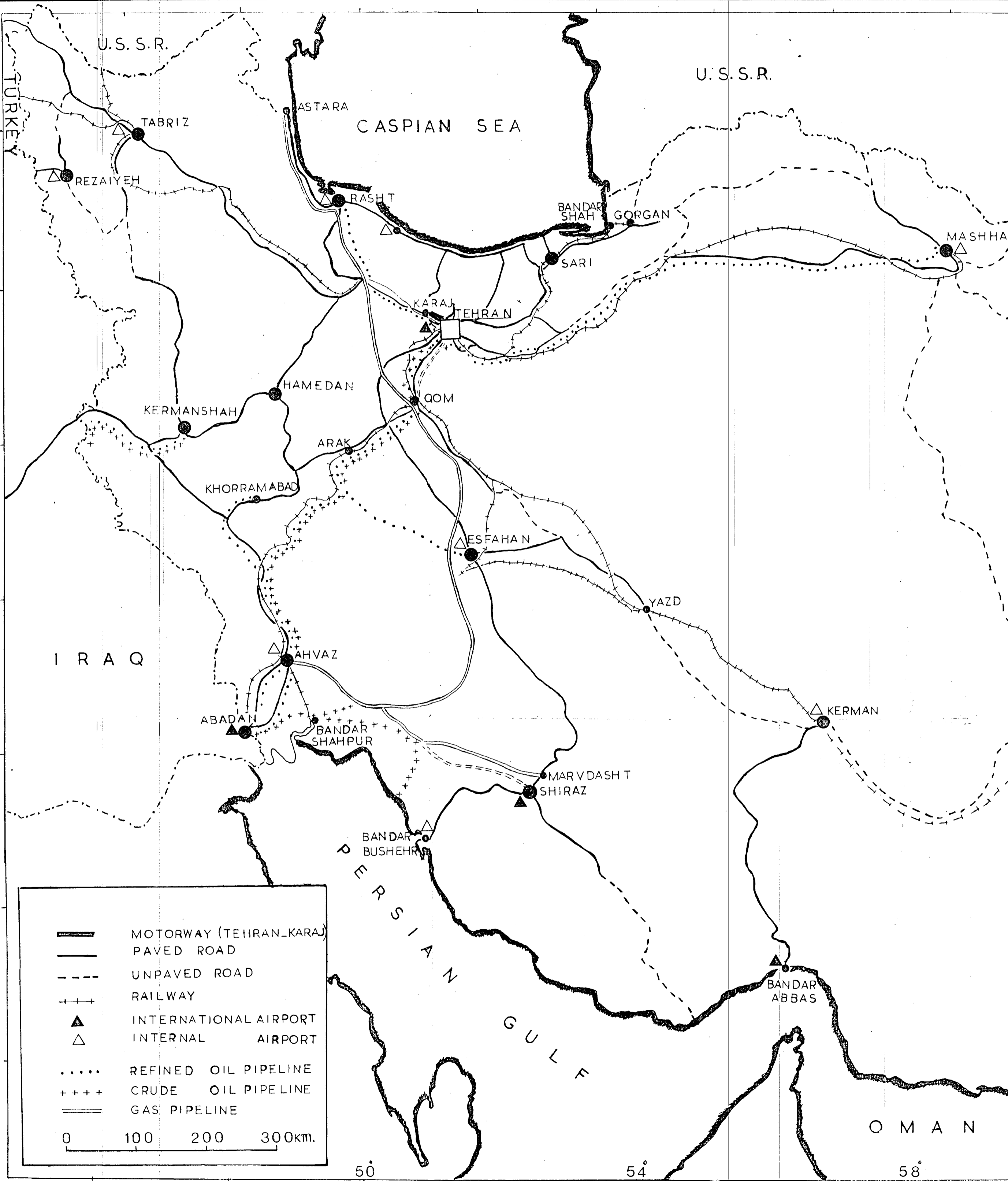
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SEE APPENDIX 3 FOR EXPLANATION OF NUMBERS.
SOURCE: FIELD WORK.

POSITION OF TEHRAN IN RELATION TO MODERN COMMUNICATIONS.



SOURCE: IRAN ALMANAC, 1971.