

SPATIAL STRUCTURE OF  
PILGRIM HOUSING IN  
MECCA, SAUDI ARABIA

Thesis for the Degree of M. A.  
MICHIGAN STATE UNIVERSITY  
GHAZY ABDUL WAHED MAKKY  
1976

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ABSTRACT

SPATIAL STRUCTURE OF PILGRIM HOUSING  
IN MECCA, SAUDI ARABIA

by

Ghazy Abdul Wahed Makky

This thesis is a detailed description and interpretation of the spatial structure of the pilgrims' housing in Mecca, Saudi Arabia. The data were obtained by field observation and by a survey started in October, 1975. Two hundred twenty-two questionnaires were completed and returned, yielding the following information--rental cost, accommodation size, number of residents, national origin of the pilgrims, quality of accommodation, type of rentals, and the comments and complaints of the pilgrims. The above housing conditions were tested against the following variables--accessibility, distance (from the Holy Mosque or the cultural focus of the city), and elevation from sea level.

It was found that accessibility to the Holy Mosque influenced the rent cost and the size of the accommodations.

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Distance from the Holy Mosque had an effect on the pilgrims' general attitudes and number of pilgrims per accommodation. Distance was also relative in the location of the four types of rentals; pilgrim leaders tend to be located greater distances away from the Holy Mosque while the pilgrim agents tend to live within shorter distances from the Holy Mosque. A curvilinear relationship between distance and rent cost is proven. Elevation from sea level has great effect on rent cost, quality, and accommodation size.

The significant findings of this study are: The city center is overloaded by the influx of pilgrims during the period of the pilgrimage obviating the shortage of good quality housing, public utilities and facilities within the city as a whole and the center in particular.

Research is indicated to further increase quality and quantity of pilgrims' accommodations and public facilities. The process of decentralization of pilgrims' accommodations is greatly recommended.



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SPATIAL STRUCTURE OF PILGRIM HOUSING  
IN MECCA, SAUDI ARABIA

by

Ghazy Abdul Wahed Makky

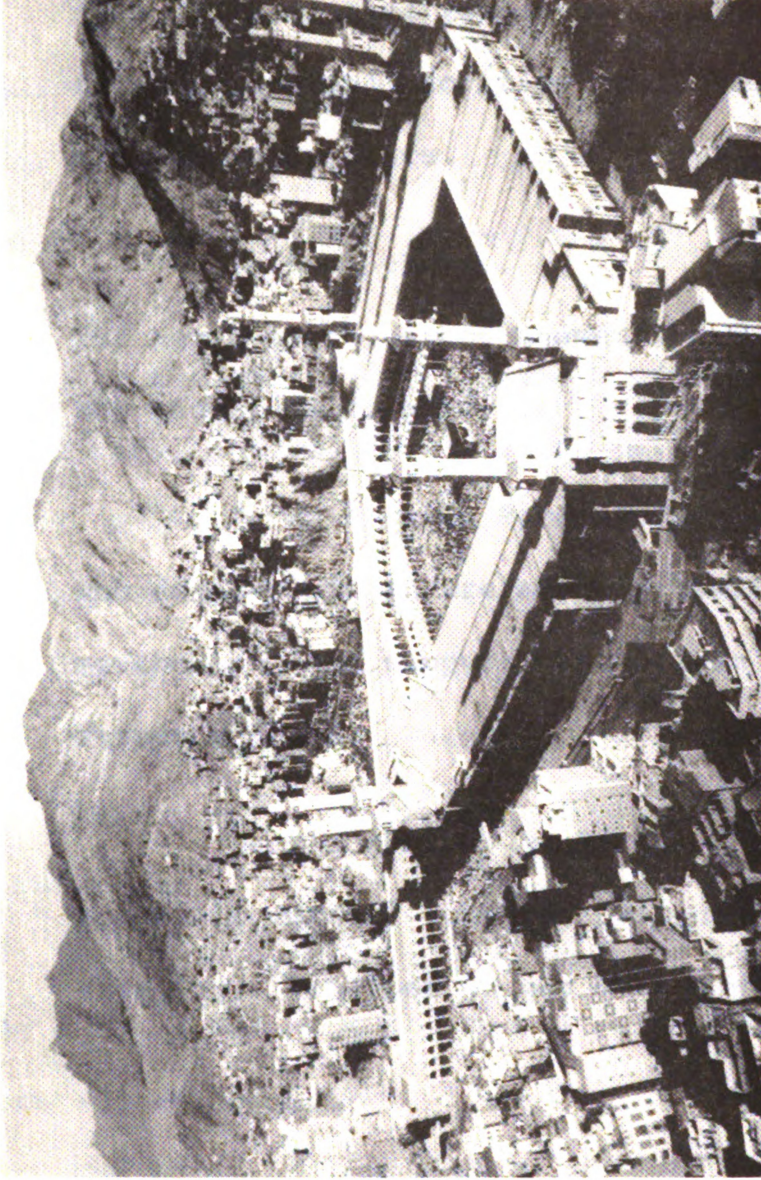
A THESIS

Submitted to  
Michigan State University  
in partial fulfillment of the requirements  
for the degree of

MASTER OF ARTS

Department of Geography

1976



Aerial view of the Holy Mosque (Al-Masjid Al-Harām)  
and Central Mecca, Saudi Arabia.

Source: Saudi Arabia Ministry of Communication



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## DEDICATION

*To my late father...*

for his love and sacrifice until the last minutes in his life.

*To my mother...*

for her support, encouragement, and the love she taught me to give.

*To my brother Mohammed...*

who devoted his future and his health to give me the love and support that I lost after my father's death.

*To the rest of my brothers and sisters...*

for their caring, support, patience, and understanding. Together we can overcome any obstacle.

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The chairman of the author's committee, Dr. David E. Stephenson, provided guidance of this research. His comments, observations and suggestions were invaluable. The author is indebted also to Dr. Joe T. Darden and Dr. Jay R. Harman for their comments and suggestions.

Financial support was provided by Riyadh University to enable me to continue my studies and to complete this research.

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search. Mr. G

useful informa

Finally

Graff, Nancy M

colleagues who

data at Riyadh

To all

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finished.

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Finally, Mr. Khalid Abdulhadi Mahyoub, Michael Graff, Nancy Martin, my typist Barbi Mel, and all the colleagues who circulated the questionnaires and collected data at Riyadh University and King Abd Al Aziz University.

To all the above the author would like to express his sincere appreciation for their assistance and support without which this work would never have been started or finished.



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A Note on Transliteration:

Arabic words are transliterated according to the system used in the International Journal of Middle Eastern Studies, except where there is a common form in English, such as "Mecca."

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CHAPTER I  
INTRODUCTION

Scope of the Study

The relationships between a settlement and its supporting area are mutual. Food, raw materials, labor, and capital come into the center from the hinterland and the settlement provides the necessary jobs, goods, and services for the external areas.

The nodality of a settlement, therefore, is a function of its ability to serve as a focus and to attract people, goods, and capital.<sup>1</sup>

Classification of Cities

Cities serve numerous functions in the economy and culture of a society. In 1921 Auroousseau classified cities

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<sup>1</sup>For further discussion of nodality, see Dean S. Rugg, Spatial Foundation of Urbanism (Dubuque, Iowa: Wm. C. Brown Co., 1972), pp. 81-84.

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<sup>2</sup>M.  
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into several urban functions: administration, defense, culture, production, communication, and recreation.<sup>2</sup>

Another classification is that proposed by Harris and Ulman in 1945, who suggested three functional types of cities:

1. Central places performing a comprehensive range of services for a more local surrounding area,
2. Transportation cities performing break of bulk and allied activities for larger regions.
3. Specialized function cities dominated by one activity, such as mining, manufacturing, or recreation and serving wider national or even international markets.<sup>3</sup>

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<sup>2</sup>M. Aurosseau, "The Distribution of Population: A Constructive Problem," Geographical Review, XI (October, 1921), pp. 563-92.

<sup>3</sup>Chauncy Harris and Edward Ulman, "The Nature of Cities," Annals of the American Academy of Political and Social Science (Philadelphia, Pennsylvania, November 1945), pp. 7-17.

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<sup>5</sup> Yeate  
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While all cities have some functions in common, each city has functions that are specific to its site and situation, and to the people that it serves. In addition, cities may have some functions peculiar to their development and their history. Hence cities may be classified more effectively on the basis of their functions than perhaps according to any other set of attributes.<sup>4</sup> This fact is demonstrated by Mecca, Saudi Arabia, a city which is unique among the great cities of the world. Just as Pittsburgh is recognized as a "steel town," or Detroit as the "automobile capitol of the world,"<sup>5</sup> Mecca is recognized as the Holy City of Islam. Muslims face Mecca daily when they perform the rites of prayer, and the city is the destination of numerous Muslims, one-and-one-half million in 1975, during the Annual Pilgrimage.

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<sup>4</sup>Brian J. L. Berry and Frank E. Horton, Geographic Perspectives on Urban System (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970), p. 111.

<sup>5</sup>Yeates, Maurice H. and Barry J. Garner, The North American City (New York: Harper and Row, Publishers, 1971), p. 60.

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### Internal Structure of Cities

As background to investigating the spatial structure of pilgrim housing in Mecca, it is useful to look at several of the conceptual theories which have been developed for American cities to explain urban land use patterns. The three major theories that have been advanced are: the Concentric Zone Theory, the Sector Theory, and the Multiple Nuclei Theory. The Concentric Zone Theory and the Multiple Nuclei Theory deal with the total pattern of land use in a city, whereas the Sector Theory was developed primarily to explain the structure of residential areas. The Zonal and Sector Theories are also used to describe changes in the basic arrangements of land use patterns, whereas the Multiple Nuclei Theory is primarily an observation of the structural form of the urban land use pattern at a particular time.<sup>6</sup>

These are idealized models--developed in a Western context. Mecca, in fact, reflects some aspects of all three of these models. The Holy Mosque (Al-Masjid Al-Harām)

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<sup>6</sup>F. Stuart Chapin, Jr., Urban Land Use Planning (Urbana: University of Illinois Press, 1965), p. 15.

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may be seen as an alternative to the Central Business District (CBD). It is the center of Mecca, and is the focus of urban life. Grouped around it are the main religious, civic, social, cultural, and commercial activities of the city. Surrounding the mosque are parking facilities, around which there is a mixture of land uses, including large blocks of apartments and private homes combined with retail shops and professional offices. These buildings are tall, having up to 12 floors (See Figure 1). Beyond this zone the growth proceeds along transportation routes which radiate from the center. Mecca also takes on the aspect of several nuclei in the quarter or neighborhood system. Each quarter has its own business activities which serve the local residents.

The growth of Mecca contrasts with the conclusion of Burgess,<sup>7</sup> who states that city growth is due partly to business and industrial pressure and partly to residential pull. Business and light manufacturing, as they develop, push out from the center of the city and encroach upon residences. At the same time, families are always

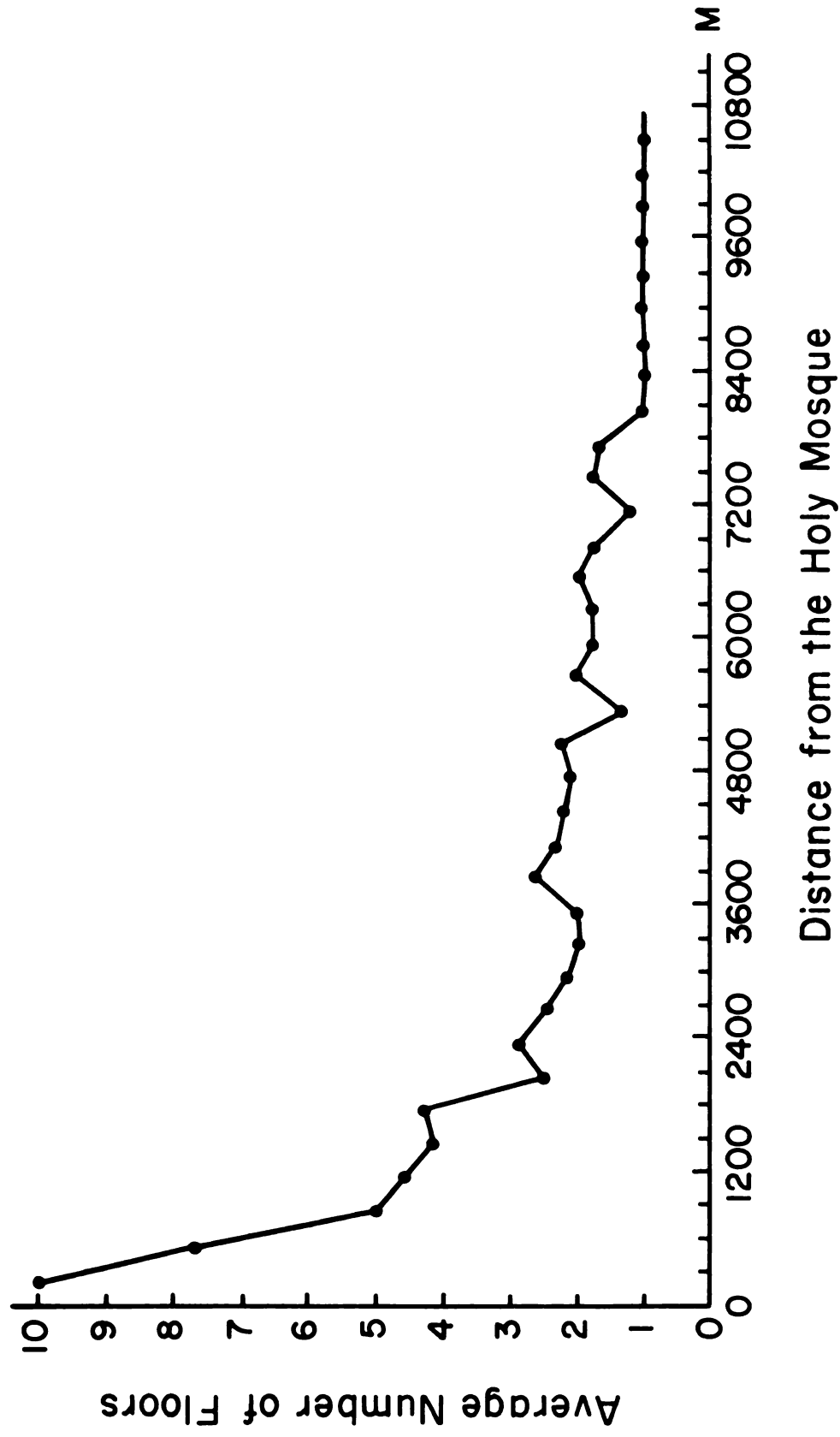
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<sup>7</sup>E. W. Burgess, "Residential Segregation in American Cities," Annals of the American Academy of Political Science, Vol. 2180 (November, 1928), p. 106.

FIG. 1 AVERAGE HEIGHT OF BUILDINGS FOR ALL QUARTERS  
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**FIG. 1 AVERAGE HEIGHT OF BUILDINGS FOR ALL QUARTERS  
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<sup>8</sup> F. Stuebel  
p. 15.

responding to the appeal of more attractive residential districts, further and further away. In addition, the sector theory claims that the different income classes of a city tend to be found in distinct areas described as sectors of a circle centered on the CBD. The high rent or high price residential areas can be identified in particular sectors, and there is a gradation of rentals downward from these high rental areas in all directions. Intermediate rental areas adjoin the high rent area on one or more sides, and tend to be located in the same sectors as the high rental areas. Low rent areas occupy other entire sectors of the city from the center to the periphery.<sup>8</sup>

While the growth of Mecca may be similar in form, it is different in process from Western cities. This growth can be explained by the following:

1. The increasing number of pilgrims every year which necessitated increasing the size of the Mosque and also increasing the residential facilities in the city.

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<sup>8</sup>F. Stuart Chapin, Jr., Urban Land Use Planning, p. 15.

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2. The enlargement of the Mosque which required removing houses and other structures from the area immediately surrounding it.
3. New housing which had to be established in new areas away from the center of the city as a result.
4. The residents whose houses were now found on the edge of the enlarged Mosque district restored or rebuilt their houses in accordance with their new importance.

#### Statement of the Problem

Classification of cities based on functional differentiation has not distinguished among several categories of economic functions. Investigations of spatial structure follow from the premises borne of economic principles. Might not cities oriented around cultural rather than economic phenomena display similarities in growth and spatial structure?

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Following the stages of growth in Mecca we notice that although this city was not capable of providing any material services, we find that it has still grown, but for religious reasons. It has developed, and will further develop and grow as a religious center of importance to all the Muslims of the world.

Mecca must be understood in terms of culture, where the religious importance of the site of the city played an important part in the development of the entire settlement. As Rugg states, "A most unusual type of site influence is that of Mecca, the birthplace of the prophet Mohammed, where the situation is based on the site."<sup>9</sup>

As the dominant institution of the cultural center, the Masjid Al-Harām is the focus of the city. It provides an important reference point for analyzing the spatial structure of the entire city. Distance from this mosque is an important variable to which other characteristics such as land values and housing costs can be related.

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<sup>9</sup>Dean S. Rugg, Spatial Foundations of Urbanism, p. 85.

### Purpose of the Study

The purpose of this study is to examine the spatial structure of pilgrim housing in Mecca, Saudi Arabia. The specific objectives are contained in the statement of hypotheses which follow.

### Hypotheses

#### 1. Accessibility to the Holy Mosque

Accessibility to the Holy Mosque influences rent cost and the quality of accommodations, while it does not affect the number of persons living in an accommodation or the size of the accommodation.

This hypothesis will be tested by one way Analysis of the Variance (ANOVA).

#### 2. Distance from the Holy Mosque

Distance from the Holy Mosque is positively related to the cost of rent, the quality, and the size of the accommodation. It also influences the choice of



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location of each nationality, and the size of their accommodations. Distance is negatively related, however, to the number of persons in accommodations and to the general attitudes of the pilgrims.

This hypothesis will be tested by one way Analysis of Variance and by simple correlation analysis.

### 3. Elevation

Elevation above sea level is negatively related to the cost of rent, quality, number of persons in, and size of accommodation, while it is positively related to the pilgrims' general attitudes.

This hypothesis will be tested by simple correlation analysis.

### 4. The Nationalities of Pilgrims

Differences occur among different nationalities with respect to rent cost, quality, and size of accommodation. Also, these differences are reflected in their attitudes toward cost-of-living and rent cost. However, these differences do not correlate with the number of

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persons in an accommodation, nor their attitudes about congestion, lack of water and other complaints.

This hypothesis will be tested by one-way ANOVA and chi square.

#### 5. The Attitudes of the Pilgrims

Pilgrims' attitudes are positively related to rent cost and the number of persons in an accommodation, while their attitudes are negatively related to quality and size of accommodation.

This hypothesis will be tested by simple correlation analysis.

#### 6. Pilgrims Resident in Different Types of Rentals

Four types of rentals are distinguished:

- 1) housing obtained through pilgrim agents,
- 2) housing obtained through pilgrim leaders,
- 3) housing obtained through the owner of accommodations,
- 4) housing obtained through the occupant of the accommodations.

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Significant differences exist among pilgrims living within the four types of rentals with respect to rent cost, quality, number of persons, size of accommodation, general attitudes, and nationality. While significant differences exist in their attitude toward lack of water, no significant differences exist in their attitudes toward congestion, cost-of-living, rent cost per accommodation, the new system of dividing the pilgrims, and other complaints.

This hypothesis will be tested by one way ANOVA and chi square.

Each of these hypotheses is broken down into a number of sub-hypotheses for purposes of specific analysis. These sub-hypotheses are presented with the analysis in Chapters 3 and 4, along with a more exact definition of each variable.

### Data and Methodology

To test the hypotheses, the following types of data were collected: interviews with pilgrims on rental cost, accommodation size, number of residents, nationality,

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quality (based on a composite evaluation of a number of amenity factors), type of rental (whether the pilgrims rented the accommodation from the owner, the occupant, a pilgrim leader of the same nationality as the pilgrim, or a pilgrim agent from Mecca), and the comments and complaints of pilgrims.

The data were obtained by field observations and by a survey conducted in October 1975.

Distance was measured from the Holy Mosque to the outskirts of the city by marking off points distant from the Holy Mosque in 300-meter intervals along the principal streets. Locations and distances were recorded on base maps of 1/1000 and 1/2500 obtained from the Town Planning Office of the Saudi Arabian Ministry of the Interior.

Information on land value and rent value (Pilgrimage Period and annual rent) were obtained from four sources:

1--Ministry of Finance,<sup>a</sup>

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<sup>a</sup>Interview with Mr. Ghazy bin-zāfir, Chairman of Saudi Arabian properties and Land Value Estimator in Mecca.



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<sup>b</sup> Interview  
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<sup>c</sup> Interviews  
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2--Mecca Municipality,<sup>b</sup>

3--Residents, pilgrim agents, and pilgrim leaders,<sup>c</sup>

4--Real estate brokers.<sup>d</sup>

Elevation and distance from the Holy Mosque were computed. In addition each location was rated as either difficult or easy in its accessibility to the Mosque.

Diagrams and a general map of rent distribution resulted from the above survey. The accompanying map shows the five zones that the area was divided into so that a spatially stratified sample could be taken (See Figure 2).

A second survey was made of the residential units chosen in the above sample. A questionnaire was prepared (see Appendix) and administered by a survey team. Each survey team chose the specific accommodation in the sample residential units and completed 222 questionnaires.

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<sup>b</sup> Interview with Mr. 'Abdullah Ka'aky for information on rent and land values.

<sup>c</sup> Interviews to obtain preliminary information on rent and location of the pilgrims.

<sup>d</sup> Information obtained from this source is incomplete since each broker has access to only a limited geographical area in Mecca.



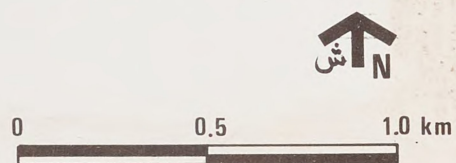


الشكل ايجار الغرفه خلال موسم حج ١٣٩٥هـ بالدولار الامريكي

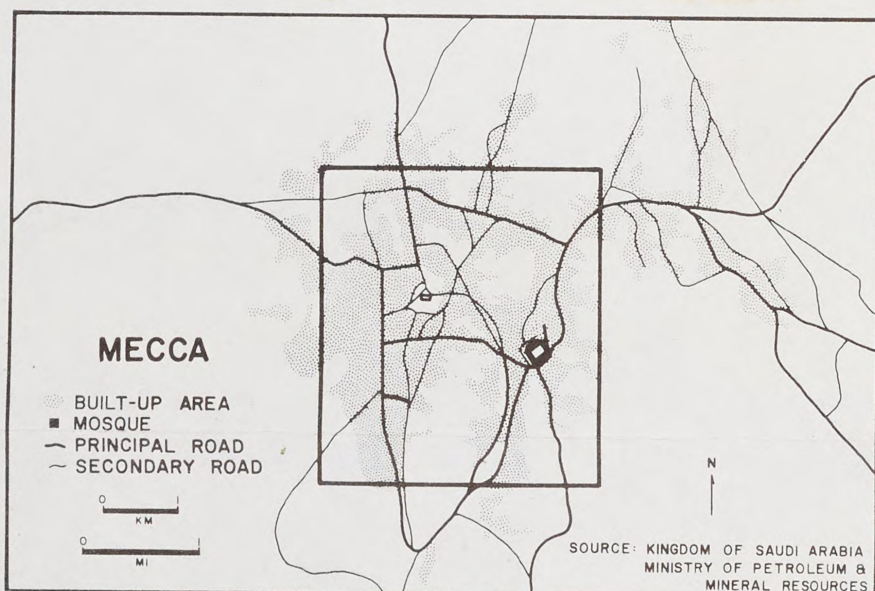
Fig 2 ROOM RENTAL 1975 PILGRIMAGE PERIOD U.S \$

G.A.Makky

غازي مكي



- Less Than 286 \$ أقل من ٢٨٦ دولار  
 287 - 857 \$ ٢٨٧ - ٨٥٧ دولار  
 858 - 1714 \$ ٨٥٨ - ١٧١٤ دولار  
 1715 - 2571 \$ ١٧١٥ - ٢٥٧١ دولار  
 More Than 2571 \$ أكثر من ٢٥٧١ دولار





University students were engaged and trained in the administration of the questionnaires.<sup>10</sup> It was arranged that the students work in teams of two; each two teams had a supervisor, and all of the supervisors had a leader in direct contact with the researcher. It was also arranged that one team be responsible for photography.

The survey was started on December 6, 1975, which is equivalent to the third of Dhu al-Hijjah. Each team was responsible for completing nine observations per eight-hour day within the location indicated on their particular maps.

### Tests

The data were analyzed statistically, using simple correlation analysis which yields coefficients of correlation which indicate the strength of the relationship between a dependent and independent variable, and the direction of the relationship. A one way test of the analysis of variance was used to test for differences among the

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<sup>10</sup>Thirty-one students in Engineering from both Riyadh and King Abd Al Aziz Universities administered the questionnaires.

means of more than two samples such as the example of accessibility and rent cost per accommodation. The chi square test was used to show whether or not the frequencies obtained differ significantly from those which would be expected.<sup>11</sup>

#### Definition of Variables

For each single room accommodation, information obtained was based on the following variables:

1--Distance: Distance from the Holy Mosque measured in meters.

2--Elevation: Elevation from sea level measured in meters.

3--Size of accommodation: Size is measured in meters: length X Width X Height.

4--Number of occupants: Number of persons in each accommodation.

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<sup>11</sup>For more information see Hubert M. Blalock, Jr., Social Statistics (New York: McGraw-Hill Book Company, 1972), pp. 275, 217, 361.

5--Rent: Pilgrims pay rent for the entire pilgrimage period, rather than by the week or month. The period is about one month for most pilgrims, but may reach three or more months for pilgrims from distant homes, such as South-east Asia.<sup>12</sup>

6--Accessibility: This is a measure which takes into consideration elevation from sea level and the distance from the main streets. Any observation located along the main street, even if it is at a high altitude, is considered as easily accessible; while any observation located away from the main street, even though it has a low altitude, is considered difficult in accessibility.

In addition, occupants were questioned about certain attitudes concerning housing and the pilgrimage in general by giving them the opportunity to express their major complaints. Specifically, pilgrims were asked about their attitudes toward rent costs and, although they were not asked specifically about other problems, their responses fell into the following categories:

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<sup>12</sup>The rent price is converted from Saudi Arabia currency to U. S. dollars at the rate of 3.5 Saudi Riyals to one U. S. dollar.

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1--Congestion: both in the accommodations and in the streets.

2--Cost of Living: including food, transportation expenses and any personal necessities.

3--Lack of water: Mecca has a water problem which becomes very serious during the pilgrimage period because of the influx of pilgrims and the temporary population increase.

4--The New System of Dividing the Pilgrims: In 1975 a new system of dividing the pilgrims among pilgrims' agents was established. The old system was that every pilgrim had a chance to choose the agent he wanted and each pilgrim made this decision when he arrived in Saudi Arabia. This system proved unsatisfactory, since certain agents bought the pilgrims from middlemen. Following this traditional method some agents could not provide the necessary services after sharing the monies received with the middlemen. Thus, some agents went out of business.

To avoid these problems, the Ministry of Pilgrimage established the "New System" of dividing all pilgrims among the pilgrim agents. Every pilgrim agent is assigned a



number of pilgrims equal to the average number of pilgrims he had in each of the last three years, up to a maximum of 3,000. Those agents who did not have any or had less than one hundred pilgrims would now get one hundred pilgrims as a beginning, and this number will increase in succeeding years if his services warrant it.

Respondents had different opinions about the new system. Some preferred a particular agent since they or their friends were familiar with him.

5--Other Complaints: Pilgrims complained about several things, such as the treatment of the drivers and customers in Jeddah Airport, Saudia Arabian Airlines services, a lack of water, lack of sanitary facilities--especially in the center of the city, and lack of information about religious historical events.



## CHAPTER II

### MECCA AS A PILGRIMAGE CENTER

#### Location

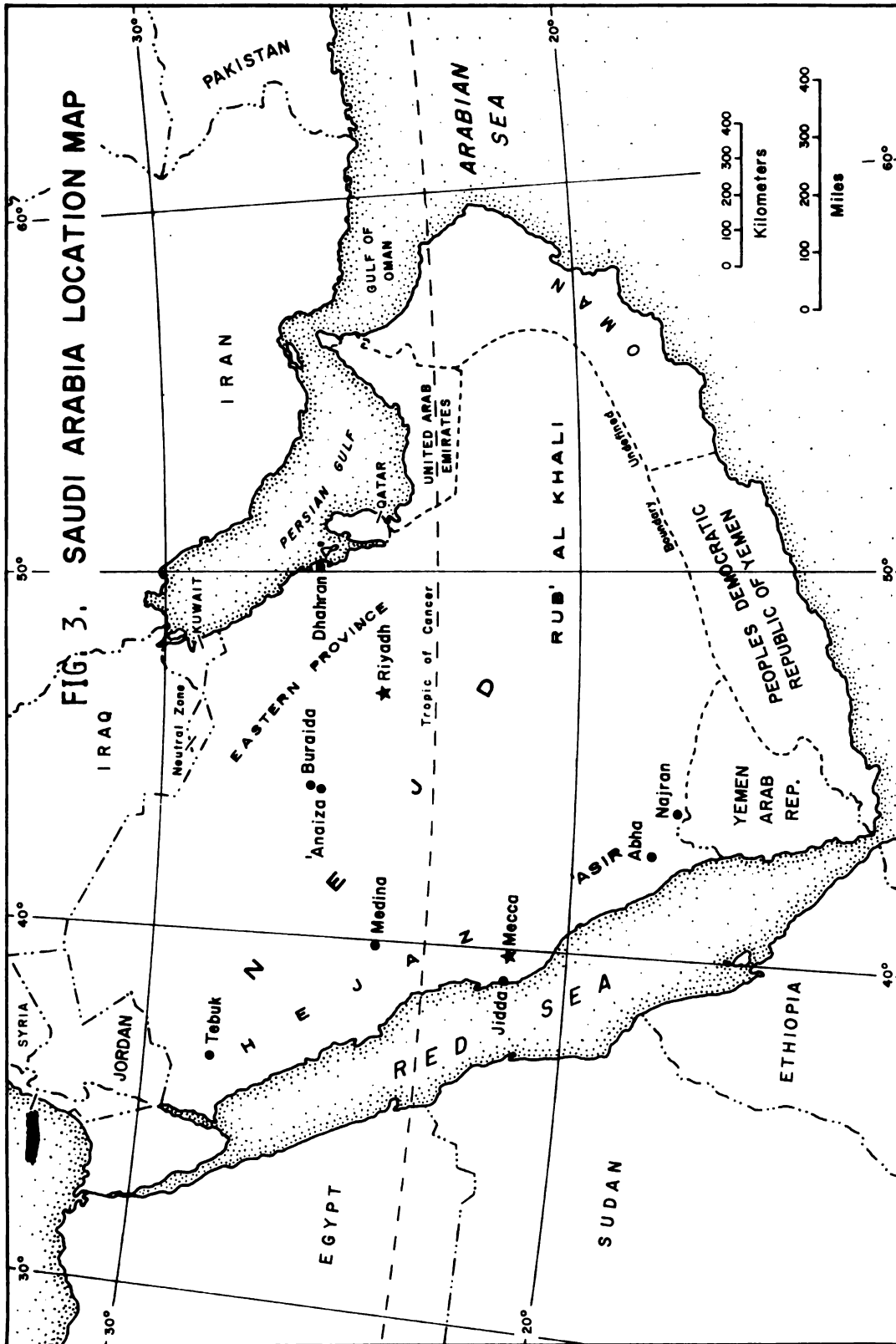
##### Site and Situation

Mecca is located on 21°25' north of the Equator and 39°44' 30" East of Greenwich. It is located in the Sirāt Mountains inland from the Red Sea. The city is situated in an area of crystalline rocks, which include igneous and metamorphic rocks, such as shists and gneiss. Also the area contains granitic rocks of pre-Cambrian Age.<sup>1</sup>

Mecca stands at the half-way point on the caravan route between Yemen and Syria. Several roads go to Yemen in the South and to Jeddah in the West and to Madina in the Northwest; also there are two routes leading to Taif in the Southeast and to Nejd in the Northeast (see Figure 3).

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<sup>1</sup>Arthur N. Strahien, Introduction to Physical Geography (New York: Wiley, 1973), pp. 422-449.



## Historical Background and Growth of Mecca

### Historical Background

According to Muslim belief, the importance of Mecca can be shown from early history. Allah (God) selected this isolated and lonely place in the middle of the barren foothills of the Arabian peninsula to be a new residence for Ibrahim's family, his wife Hagar, and his son Ismail, and eventually to be the cradle of His heavenly Islamic message to humanity and the center of the Islamic religion for all Muslim nations of the world.<sup>2</sup>

Muslim historians indicate that the history of Mecca started when God instructed Ibrahim to settle part of his family in this lonely location. Obeying these instructions, Ibrahim, with his wife Hagar and their infant son Ismail, left Syria--a land flourishing with fruits, vegetables and rivers--and headed for Mecca and the site of what is today the Holy Mosque. There Ibrahim left them. No life whatsoever existed in that area, but

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<sup>2</sup> Kingdom of Saudi Arabia, Alternative Urban Strategies, Ministry of Interior, Municipal Affairs Regional and Town Planning Department, August, 1972, p. 13.

Hagar's search for water was eventually rewarded when she noticed that a spring (later called Zam Zam) was issuing from the ground near where she had laid Ismail.

Tribes in the South heard about this spring, and they moved there to share with Hagar and her son the benefit of this water. Houses started to rise on the site as the tribes settled and the density of buildings around the place increased little by little.<sup>3</sup>

According to Muslim belief, God commanded Ibrahim to build the sacred house known as the Ka'aba. He went to Mecca and found his son Ismail who was by now a grown man of 20 years and respected by the surrounding tribes.<sup>4</sup>

When the Islamic religion was established, the Mosque as a whole and the Ka'aba in particular symbolized the unity and brotherhood of the Muslim community throughout the world.

Muslim historians tend to believe that before the Islamic religion was established Mecca was the focal point

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<sup>3</sup>Mohammed Tahir al-Kordi Al-Makky, Authentic History of Mecca and Holy House of God, Volume II, First Edition (Mecca: Al-Nahddah Library, 1385 [1965]), p. 9.

<sup>4</sup>Mohammed Tahir al-Kordi Al-Makky, Shrine of Ibrahim (Cairo: Muṣṭafa al-Halabi Press, 1368 [1948]), p. 31.

for all the Arab tribes who used to come every year to visit the sacred house and to attend the yearly poetry convention. Mecca gained spiritual importance during the period of the prophet Mohammad and has continued to grow. According to Muslim belief, the Lord has provided Mecca with a reason for growth and development as millions of Muslims continue to come for the Pilgrimage.

As stated in Chapter One, the site of Mecca influences its situation; the site of Mecca was never a source of material fortunes but started as a center for religious and spiritual teachings. Several tribes settled there and started to trade and work in services needed by the pilgrims. It became an important center on the caravan routes between Yemen and the Mediterranean Sea countries to the North.

Since Mecca has such a strong influence upon every Muslim, a number of pilgrims inevitably remained and settled in Mecca and mixed with the original inhabitants. This process continues today and there are distinguished in some areas certain characteristics representative of peoples foreign to Saudi Arabia, such as architectural styles.

### Growth of Mecca Before Islam

According to Muslim belief, Allah (God) selected this isolated and lonely place in the midst of the barren foothills of the Arabian Peninsula to be a new residence for Ibrahim's family. After the well of Zam Zam was miraculously created, and before Ibrahim began to build the Ka'aba, the Arab tribe of Beni Jurham settled there, with the permission of Ismail and his mother. Ismail then intermarried with the Jurham tribe. After his death the Jurham inherited the well and the Ka'aba.<sup>5</sup>

Afterward, the tribe of Kuzā'a kept possession of the Ka'aba for about three centuries. Quṣay Ibn Kilāb was one of their successors. He took advantage of the Ka'aba, being respected by the Arab tribes, and encouraged his tribe to build their own houses around the Ka'aba. He started by building Dar al-Nadwa which had become the common council-house of the Chiefs of Mecca. In these houses the tribe of Quṣay lived during the day, but in

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<sup>5</sup>J. L. Burckhart, Travel in Arabia (London: Frank Cass & Company, Limited, 1968), p. 163.



the evening they always returned to their tents pitched upon the neighboring mountains.<sup>6</sup>

The successors of the Beni Quṣay at Mecca were the Beni Quraysh. The Qurash had built a small town around the Ka'aba which they respected so much that no one was permitted to raise the roof of his house higher than that of the sacred structure. The pilgrimage to this holy shrine, which the pagan Arabs had instituted, was continued by Islam. When the Prophet Mohammed entered Mecca he destroyed the images in the temple and abolished the idolatrous worship by his countrymen.<sup>7</sup>

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<sup>6</sup> Ghazy Abdul Wahed Makky, "The Geography of the City of Mecca." Unpublished report for the degree of B.A., Faculty of Arts, Riyadh University, 1971-72.

<sup>7</sup> J. L. Burckhart, Travel in Arabia, p. 164. The purpose of the above narrative is to highlight the growth of Mecca, not to detail the founding of Islam. For information on this subject, see Erick Wolf, "The Social Organization of Mecca and the Origins of Islam," Southwestern Journal of Anthropology, Vol. 7 (1951), pp. 329-356; and Barbara Aswad, "Social and Ecological Aspects in the Formation of Islam," in Louise Sweet (ed.), Peoples and Cultures of the Middle East, Vol. 1 (Garden City, N.Y.: Natural History Press, 1970), pp. 53-73.

### Mecca During the Caliphate Period

'Omar Ibn al-Khaṭṭāb, the second caliph,<sup>8</sup> first built a mosque around the Ka'aba in the year 17 A.H.,<sup>9</sup> about 638 A.D., having purchased from the Quraysh the small houses which enclosed it, and built a wall around the area.

'Uthmān Ibn 'Affān, in 27 A.H. (about 648 A.D.), enlarged the square. By the end of 40 A.H., (661 A.D.), the size of the built-up area in Mecca was about 164,000 square metres or about 16 hectares.<sup>10</sup>

### Mecca During the 'Ummayyad, 'Abbāsīd, Fatimid, Ottoman Periods

During the 'Ummayyad Caliphate, Mecca experienced little growth. Such growth which occurred, happened during Ibn al-Zubayr's reign as caliph. He enlarged the enclosure of the wall by purchasing properties from Mecca's

<sup>8</sup>The Caliph is the successor to Mohammed.

<sup>9</sup>A.H., "after the Hijra," the flight of Mohammed, or 622 A.D.

<sup>10</sup>These and the following statistics on the area of Mecca are from a series of articles by 'Abdul 'Aziz Husayn which appeared in the newspaper Al-Nadwa, under the title "The Expansion of Mecca" in 1390 A.H.

residents and after leveling the houses, included these sites within the mosque.

The size of Mecca, by the end of 'Ummayyad Caliphate in 132 A.H. (about 752 A.D.) was 346,000 square metres. The boundaries of Mecca at that time were Al-Rāya Mosque on the East and Shubayka Square on the Southwest.<sup>11</sup>

During Abbāsid Caliphate, many of Mecca's residents emigrated to Syria, Iraq, Egypt, and Morocco, but during the 'Abu Ja'aFar al-Mansūr Caliphate, in 139 A.H. (about 759 A.D.), the north and south sides of the mosque were enlarged to twice its previous size

In 163 A.H. (783 A.D.), the Caliph Al-Maḥḍy again added to the size of the mosque by buying the land required to increase the size of the mosque from Mecca's residents.

During Fatimid caliphate Mecca experienced little settlement growth, although many castles were built by the caliphs themselves. The size of Mecca by 923 A.H. (1512 A.D.) was 588,000 square metres.

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<sup>11</sup>Ahmed Al-Sibā'i, Tarīkh Makka [The History of Mecca] (Quraysh Publications 1380-1382 Vol. 1), p. 26; and Qutb Al-Dīn Al Hanafi Tarīkh Al-Qutbi [History of Al-Qutbi] (Mecca: Scientific Library, n.d.), pp. 73-84.

Up to 1100 A.H. (1689 A.D.) Mecca was a good example of the Arabian Muslim town, where the mosque and squares represent the basic center of the city. This is because Islamic instruction, guidance, and social affairs were directed by rulers of the cities from such places. Afterward, mosques and squares that surround the rulers' houses functioned as basic centers for these cities' activities and collective behavior. By this time Mecca included an important core, the Holy Mosque, and an open square around it that was bounded by residential buildings. Small shops filled in where possible and smaller mosques were built scattered throughout the city.

Mecca in the Ottoman period (between 1000 A.H. and 1343 A.H. (1689 A.D. - 1924 A.D.) came under Turkish influence. Turkish architectural styles started to appear everywhere in Mecca. The city, however, maintained its basic Arabic style, especially as far as having the main activities centered around the sacred Mosque. In this same period the built-up area increased considerably to meet the ever-increasing number of people resulting from the increasing number of pilgrims, due in part to the completion of the Hejaz railway from Syria to Madina. During this period

the size of Mecca grew to 1,400,000 square meters (See Figure 4).

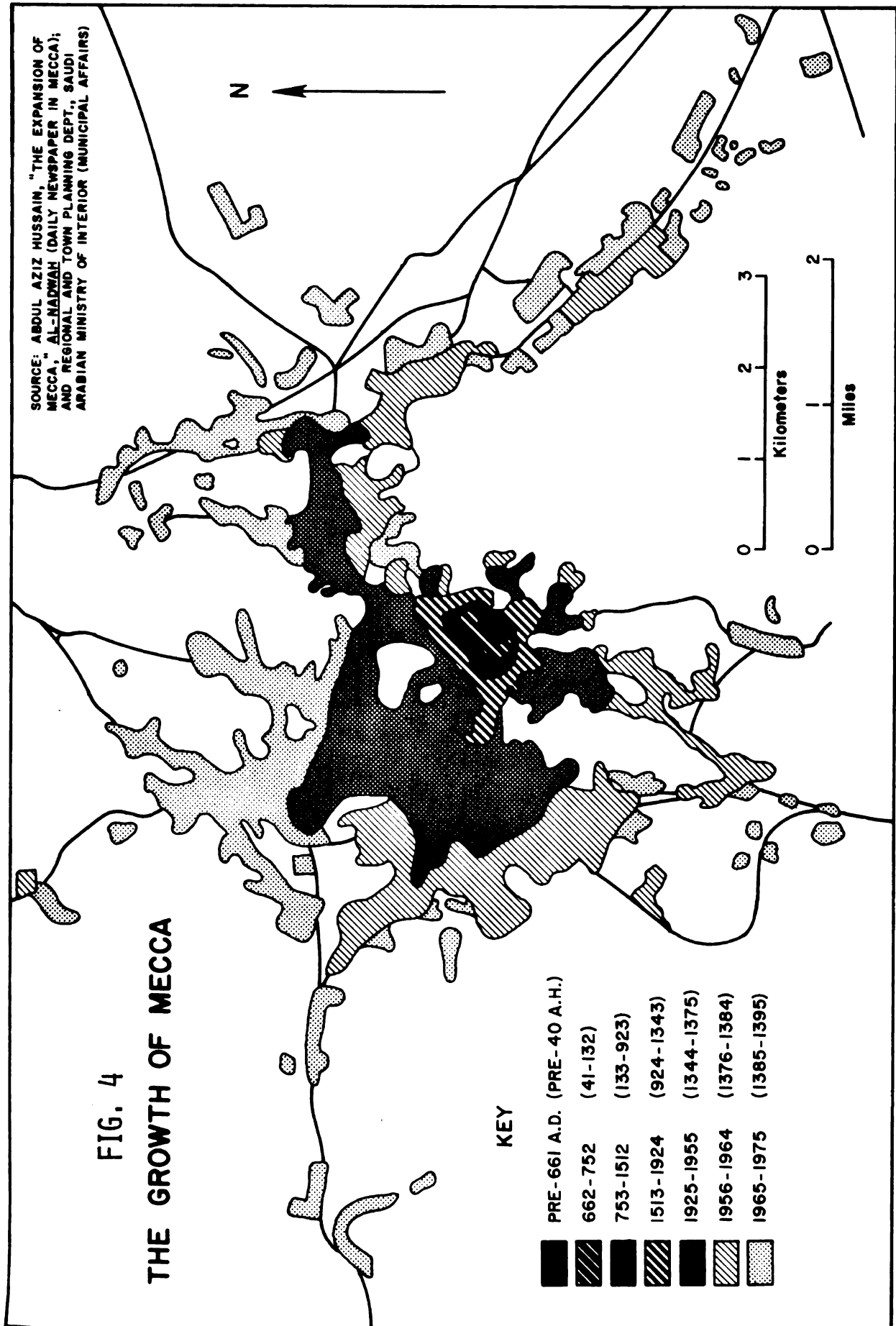
Among the visitors to Mecca was Burckhardt who visited the city in the eighteenth century.

In Burckhardt's description of Mecca, he says:

Mekka may be styled a handsome town: its streets are in general broader than those of eastern cities, the houses lofty, and built of stone, and the numerous windows that face the streets give them a more lively and European aspect than those of Egypt or Syria, where the houses present but few windows towards the exterior. At Mekkah it was necessary to leave the passages wide, for the innumerable visitors who here crowded together, and it is in the houses adapted for the reception of pilgrims and other sojourners, that the windows are so contrived as to command a view of the streets.

The only public place in the body of the town is the ample squares of the great mosque; no trees or gardens cheer the eye; and the scene is enlivened only during the Pilgrimage by the great number of well-stored shops which are found in every quarter. Except four or five large houses belonging to the sherif, two medresses or colleges (now converted into corn magazines), and the mosque, with some buildings and schools attached to it, Mecca can't boast of any public edifices and in this respect is, perhaps, more deficient than any other eastern city of the same size.

. . . neither Khans, for the accommodation of travelers or for the deposit of merchandise, nor places of grandees, nor mosques, which adorn quarters of other towns in the East, are here to be seen, and we may perhaps attribute this want of splendid buildings to the



veneration which its inhabitants entertain for their temple; this prevents them from constructing any edifices which might possibly pretend to rival it.<sup>12</sup>

### Modern Mecca

During the period of the Saudi government between 1343 A.H. and 1375 A.H. (1924 A.D. - 1955 A.D.) with the discovery of petroleum in the Kingdom and the establishment of a stable nation state, Mecca has witnessed a considerable boom in its growth. Its size became 7,121,000 square metres. Easier and quicker methods of transportation have also helped contribute toward this rapid expansion and growth.

The change since the time of Burckhardt has been great. Mecca in the last two decades has seen a new era of development and expansion. Modern planning has been applied during this period, focusing on modern communication, public services, and other improvements.

Mecca has expanded along the roads through the mountain valleys away from the city center. Expansion

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<sup>12</sup>J. L. Burckhardt, Travel in Arabia (London: Frank Cass & Company, Limited, 1968), pp. 103-106.

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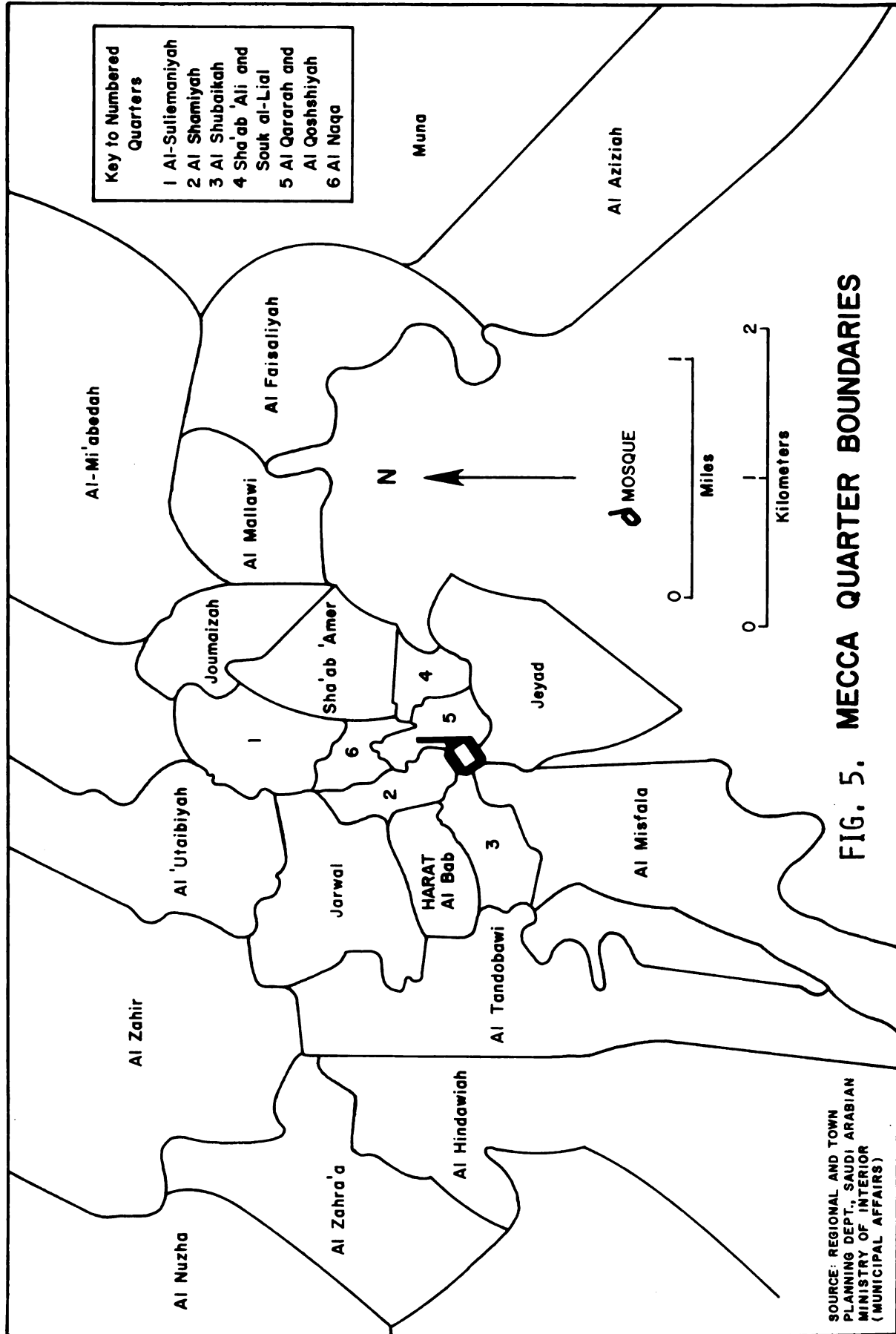
has been accomplished by the construction of new streets in different parts of the city. Fountains have been built in its four main squares. Houses near the Holy Mosque have been raised up to 13 stories, and they are surrounded by open spaces and wide streets. Pilgrimage accommodations are not tied to the city's center but they are spread out to reach the peripheries in the quarters of Al-'Azīziyya, Al-Nuzha, Al-Zāhir, and Al-Zuhara' (see Figure 5).

Mecca's 35,269 houses in 1970 are more compacted in the old city than in the newly developed residential areas.<sup>13</sup> With the new projects which have been established, many houses--especially those in the old city--have been removed to enlarge the area of the Holy Mosque and allow the construction of new and wider roads. The above projects force clearing in the city center and expansion on the periphery of the city.

By the end of 1975 Mecca extended over the mountains located within the city and also along the main streets that led outside the city. Such streets are al-Azīziyya Street toward the northeast about 11 kilometers

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<sup>13</sup> This figure is provided by the Office of Municipal Affairs in Mecca.



from the city center, al-Tan'īm Street toward the northwest about 8 kilometers, al-Misfala toward the south about 4 kilometers, Jiyād toward the east about 2 kilometers, 'Um al daraj toward the west about 8 kilometers from the city center. Development along these streets is illustrated in Figures 6 - 10, where the profile of the city is presented in cross-section along the above-named major streets.

#### Physical Geography of the Mecca Region

Mecca has the shape of a star with the Holy Mosque located in the center. The city lies amid a complex of mountains and alluvial valleys. The mosque is located in a low part of the city, at an elevation of 277 meters above sea level. These topographic conditions cause many difficulties during the rainy season as most areas suffer from floods, especially the area of the Holy Mosque which is located in the middle of the wide Ibrahim Valley.

**FIG. 6 CROSS SECTION FROM AL-MASJID AL-HARĀM TO AL-AZIZIAH**

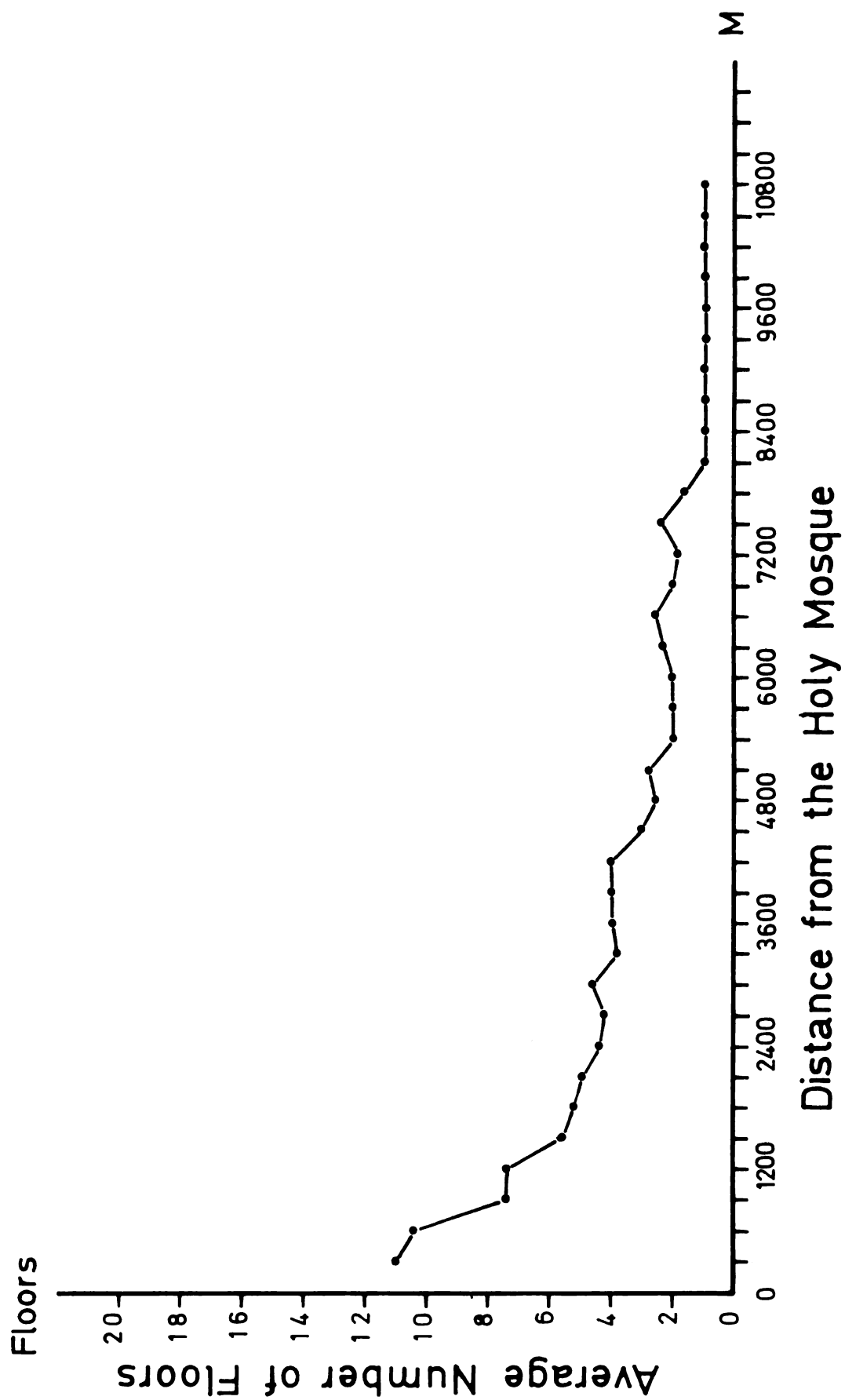
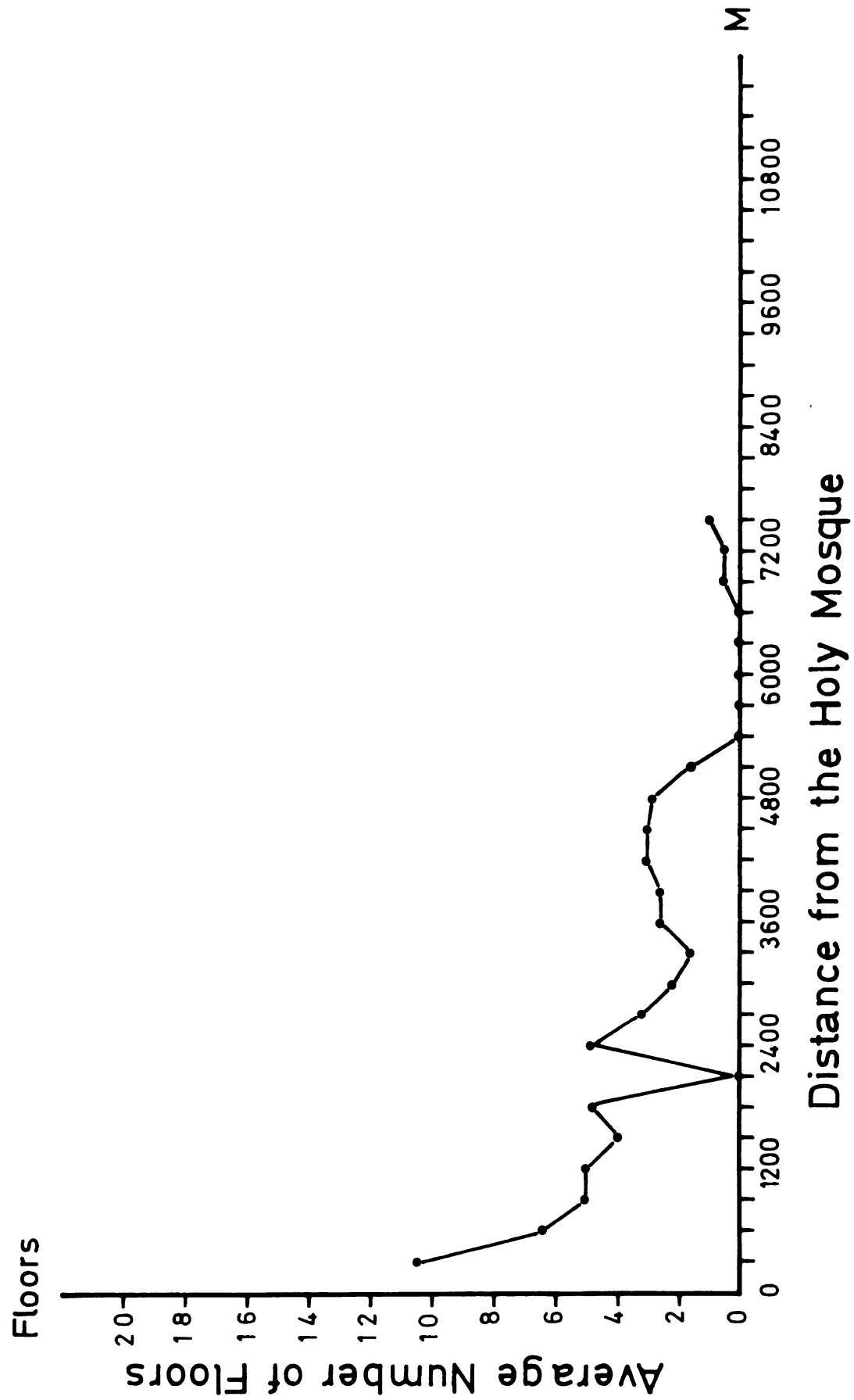


FIG. 7 CROSS SECTION FROM AL-MASJID AL-HARĀM TO AL-TAN'ĪM



**FIG. 8 CROSS SECTION FROM AL-MASJID AL-HARĀM TO AL-MISFALA**

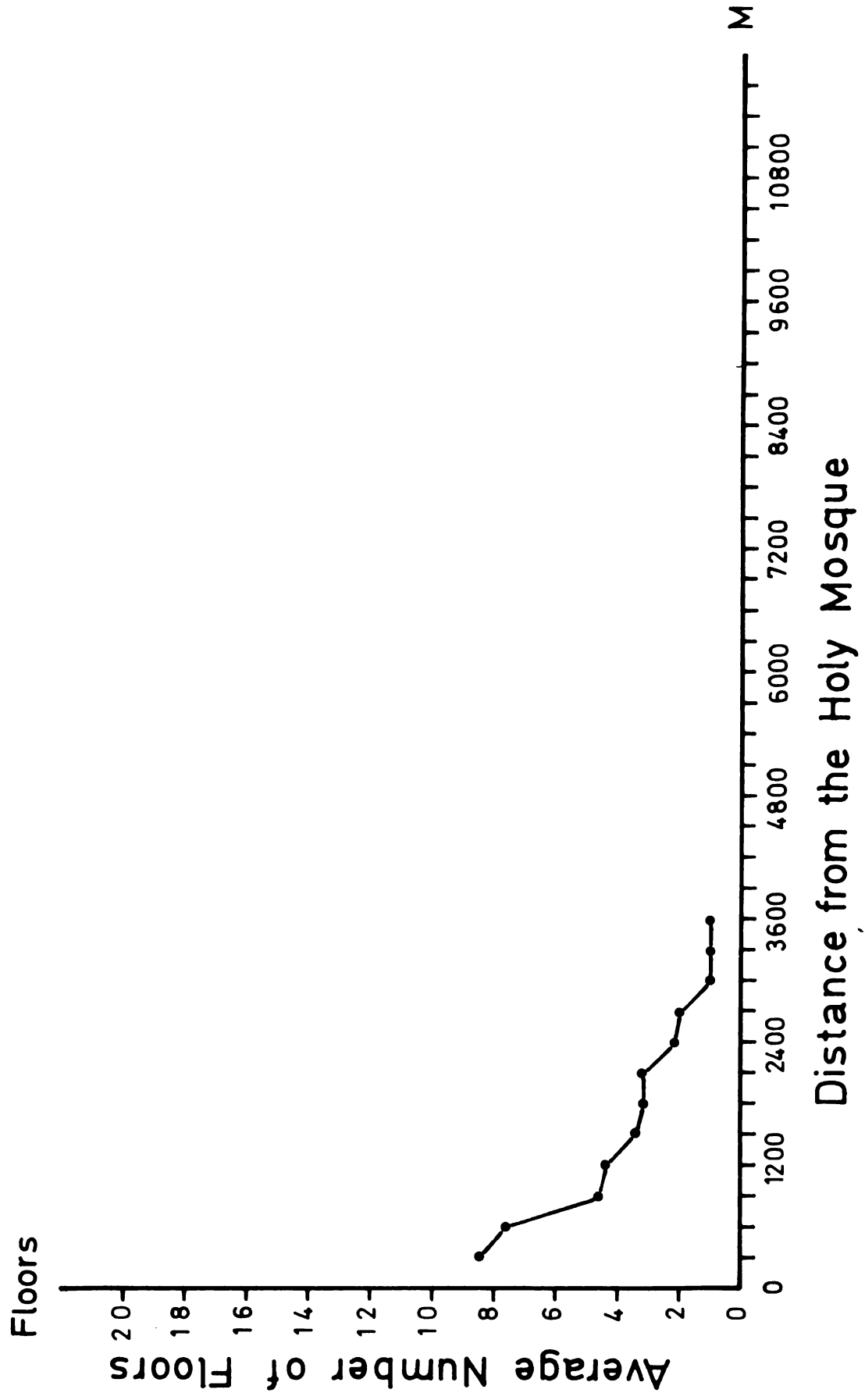


FIG. 9 CROSS SECTION FROM AL-MASJID AL-HARĀM TO JIYĀD

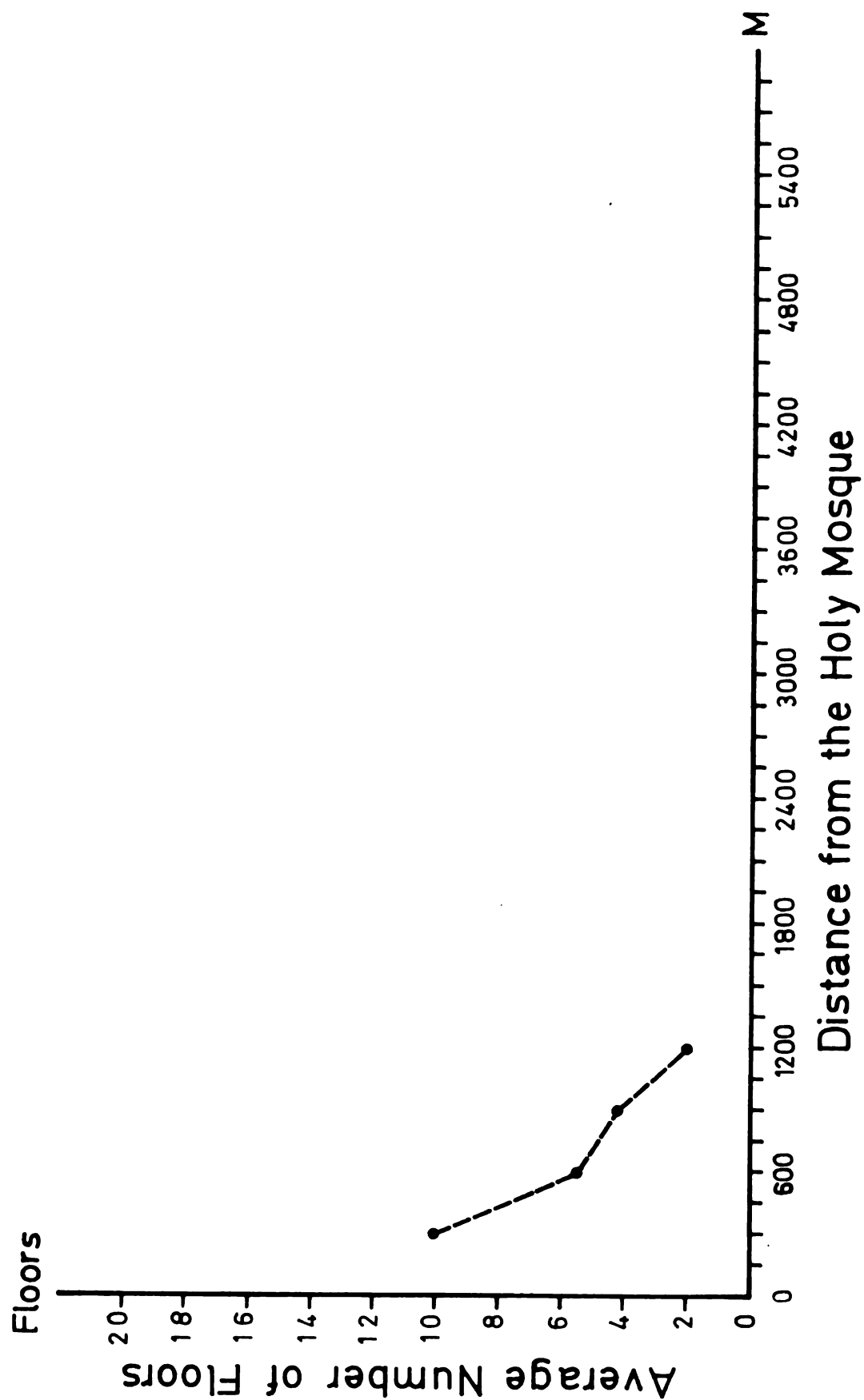
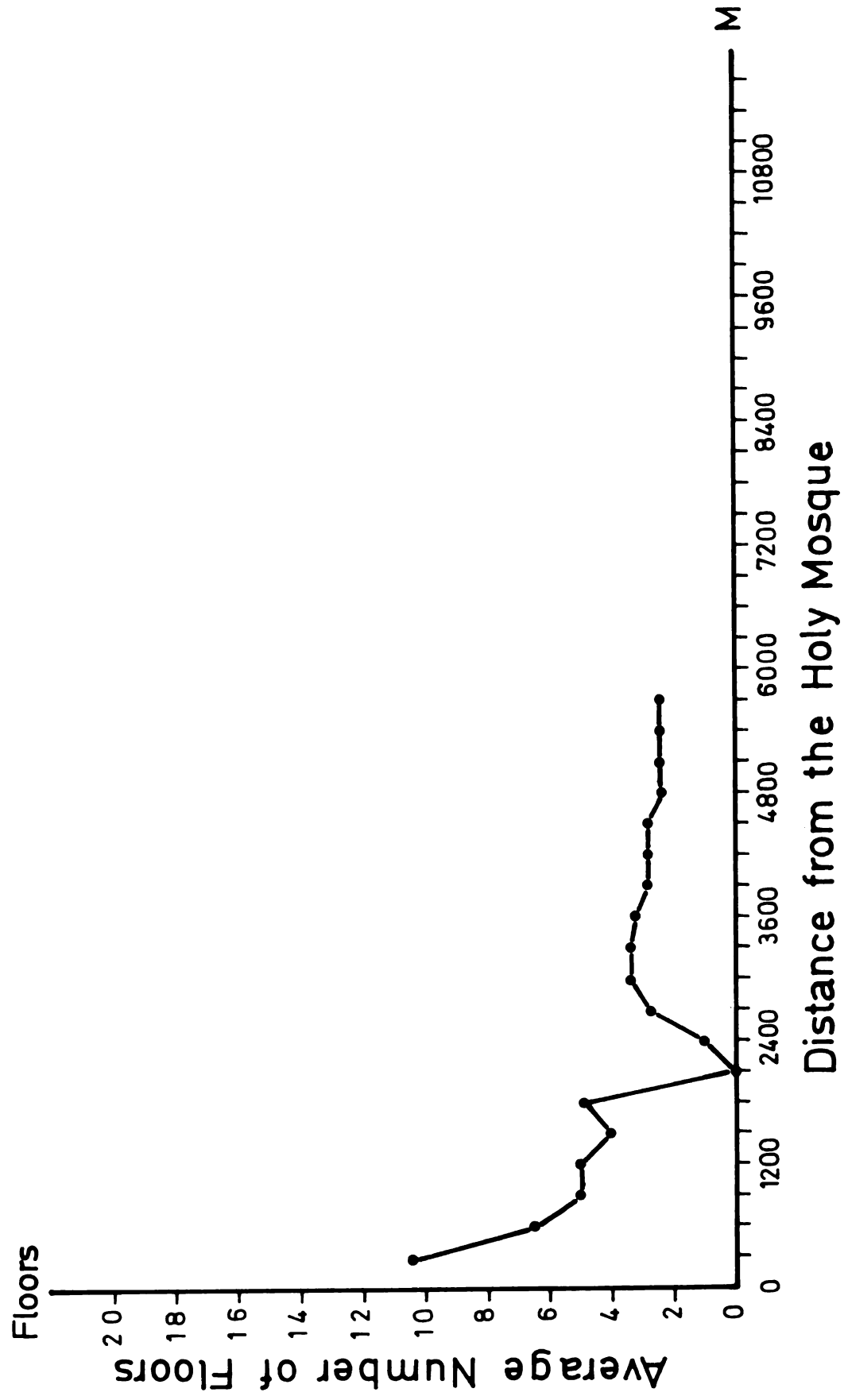


FIG. 10 CROSS SECTION FROM AL-MASJID AL-HARĀM TO 'UM AL-DARAG





## Relief

Of interest in the topography of Mecca are numerous mountains with unique historical and physical characteristics. These mountains are:

Hirā' Mountain.--Called also "light mountain," Hira is located in the Northeast of Mecca. It rises to an elevation of about 634 metres above the sea level, and has rough slopes in all directions.

Hirā' Mountain contains a cave, facing the Holy Mosque, which the Prophet Mohammed used to meditate in before he became the messenger of Allah. It was in this cave where he received the first message of the revelations which were to become the Qur'ān.

Thawur Mountain.--Located to the South of Mecca, this peak rises to an elevation of about 759 metres. Thawur Mountain contains the cave in which the prophet Mohammed and his friend 'Abu Bakr, who became the first caliph, hid from the people of Mecca who rejected his message. It was from this cave that Mohammed left secretly for Madina, an event known as the Hijra.

'Abu Qubays Mountain.--Located to the East of the Holy Mosque, this mountain rises to an elevation of about 372 metres, and slopes roughly toward the East and the Northeast where the peak of Khandama Mountain rises to an elevation of 420 metres.

At the peak of 'Abu Qubays Mountain there is the Bilāl Mosque, an old historical landmark which dates from the time of Mohammed. Since this mountain is located very close to the Holy Mosque, many people have built their houses on its slopes. These houses are clustered so compactly that it is necessary to build stairs to reach the houses, rather than streets.

QaL·a't Jiyād Mountain is located to the Southeast of the Holy Mosque between Jiyād and Misfala Streets and rises to an elevation of 406 metres sloping gently toward the North. This mountain is named for the castle which is located at the peak of the mountain, also facing North toward the Holy Mosque.

'Umar Mountain.--The name is used for the northern part of the mountain chain which is parallel to the QaL·a't Jiyād Mountain chain. 'Umar Mountain rises to an elevation

of 380 metres. 'Umar Mountain rises to an elevation of 380 metres. This mountain is very densely settled, especially on the parts facing the Holy Mosque.

Ka'aba Mountain.--Located to the Northwest of the Holy Mosque, it rises to an elevation of 340 metres and slopes gently in all directions.

Qa'īqu'ān Mountain.--Also is part of a complex mountain chain which has several names depending on the specific location. The best known local name for Qa'īqu'ān Mountain is Hindi Mountain. It rises to an elevation of 427 metres and slopes steeply toward the East, Southeast and the West.

'Adhakhir Mountain Chain.--This mountain chain lies to the North of the Mosque and rises to an elevation of about 426 metres. The peak of this mountain chain is located in the northern part of the chain at 442 metres and slopes abruptly toward the East.

Climate

Comprehensive climatic data are available for a short period of record in Mecca. The single meteorological station in the Holy City began to operate only in 1970; the temperature data are available for 1970, only, and therefore are not representative of average conditions on a statistical basis.

Mecca's weather is very hot in the summer and warm in the winter. In some years there is little if any rainfall; however, there have been instances of excessive rainfall causing considerable damage. Though such damaging rains are infrequent, the last occurrence was in 1968 A.D.

Wind conditions in the city are variable. About 50 percent of the time the winds are southwesterly. The remaining winds are predominantly northwesterly and northeasterly.<sup>14</sup> These winds are relatively cool except in summer when they are hot and carry dust and sand from the South.

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<sup>14</sup>Kingdom of Saudi Arabia, Alternative Urban Strategies, Regional and Town Planning Department, Ministry of the Interior, Municipal Affairs, Saudi Arabia, August 1972, p. 21.

### The Temperature

The annual average of the temperature is 30.7°C (87.3°F). Such a high temperature occurs because:

1. Mecca is far away from the effects of the sea.
2. High mountains surround the city.
3. Mecca is within the tropical boundaries, which means that the sun is almost perpendicular to the area of Mecca at mid-day during the summer.

Summer Temperature.--In August the maximum temperature is 39.8°C (103.6°F), and the minimum is 32°C (89.6°F). In June the maximum is 39.6°C (103.3°F) while in July it is 38.6°C (101.5°F); in September the maximum is 39.3°C (102.7°F) while the minimum is 30.9°C (87.6°F).

The highest temperature recorded was in August 1972 at 41.6°C (106.9°F) for four days in sequence, while the minimum was 37.8°C (100°F).

Winter Temperature.--The weather in this season tends to be warm. The maximum is  $32.4^{\circ}\text{C}$  ( $90.3^{\circ}\text{F}$ ) in December and  $31.7^{\circ}\text{C}$  ( $89.1^{\circ}\text{F}$ ) in January, while the minimum in December is  $15^{\circ}\text{C}$  ( $59^{\circ}\text{F}$ ) and  $21.1^{\circ}\text{C}$  ( $70^{\circ}\text{F}$ ) in January.

The reason for the warm weather in the winter is related to the topography of the city, since the mountains prevent the cool winds from entering the city.

Spring and Fall Temperature.--The maximum temperature in April is  $33.8^{\circ}\text{C}$  ( $92.8^{\circ}\text{F}$ ) and the minimum is  $25.7^{\circ}\text{C}$  ( $78.3^{\circ}\text{F}$ ), while it increases in October to a maximum of  $37.2^{\circ}\text{C}$  ( $99^{\circ}\text{F}$ ) and a minimum of  $28.9^{\circ}\text{C}$  ( $64^{\circ}\text{F}$ ).

#### Wind Direction, Pressure, and Rainfall

In the Summer Season.--The sun becomes perpendicular to the Tropic of Cancer ( $23.5^{\circ}\text{N}$ ), consequently Central Asia has a low pressure belt, which influences the Arabian Peninsula, where there is also a low pressure belt since the percentage of occupied land in this area is greater than the percentage of water bodies. In contrast, the Indian Ocean and the

Mediterranean Sea both have high pressure zones. Consequently Mecca is influenced by the following winds: the Northwestern winds are mostly dry because of subsidence, and because no large water bodies are present to serve as sources of water vapor. The Northeast Trade Winds are dry because they pass over the desert region of the Arabian Peninsula. The monsoon winds come from the southwest and cause occasional summer rainfall.

In the Winter.--A high pressure belt is located in the Arabian Peninsula. The influence of the Azores high pressure belt located in the Atlantic Ocean and the northern Sahara is felt. Also affecting the area is the high pressure belt in Siberia. Low pressure belts are located in the Mediterranean Sea and Indian Ocean. Consequently Mecca is influenced by the following winds: 1) the Northeastern Trade Winds--these cool winds do not affect Mecca much since the mountains prevent them from reaching the city; 2) the Northwestern Winds--these winds bring occasional wet storms from the Mediterranean Sea.

### Rainfall

The total average annual rainfall for Mecca is 157.2 mm.<sup>15</sup> (See Table 1.)

The average rainfall in January is 61.7 millimetres, and in December the average is 10.8 mm, while in October the average is 9.8 millimetres. Consequently the winter season is the only wet season. Of the winter months, January has the heaviest rainfall. However, the entire rainfall for a month may occur within one or two days, causing flash floods.

### Water Resources

Mecca's inhabitants obtain water either from the government-owned resources of 'Ayn Zubaydah Authority or from a number of private wells within the city (See Figure 11).

The following table (Table 2) shows all available sources which provide water for the needs of the city. These resources are all located more than 20 km from Mecca,

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<sup>15</sup> Average of six years.



TABLE 1. RAINFALL\*  
(in millimetres)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
66	-	-	-	-	-	-	-	-	11.8	-	74.6	-	86.4
67	-	-	-	-	-	-	-	3.3	1.0	-	58.8	2.0	96.1
68	3.0	5.3	-	99.5	-	19	1.0	-	-	-	49.2	25.0	202.0
69	240.8	16.0	4.5	4.5	3.5	-	-	-	-	26.0	24.0	-	319.3
70	63.5	-	-	-	-	-	-	-	-	23.0	-	22.8	109.3
Ave.	61.5	4.3	.9	20.8	.7	3.8	.2	.7	2.7	9.8	41.3	10.8	157.2

\*Source of data: Office of Municipal Affairs, Mecca, Saudi Arabia.  
25mm = 1 inch

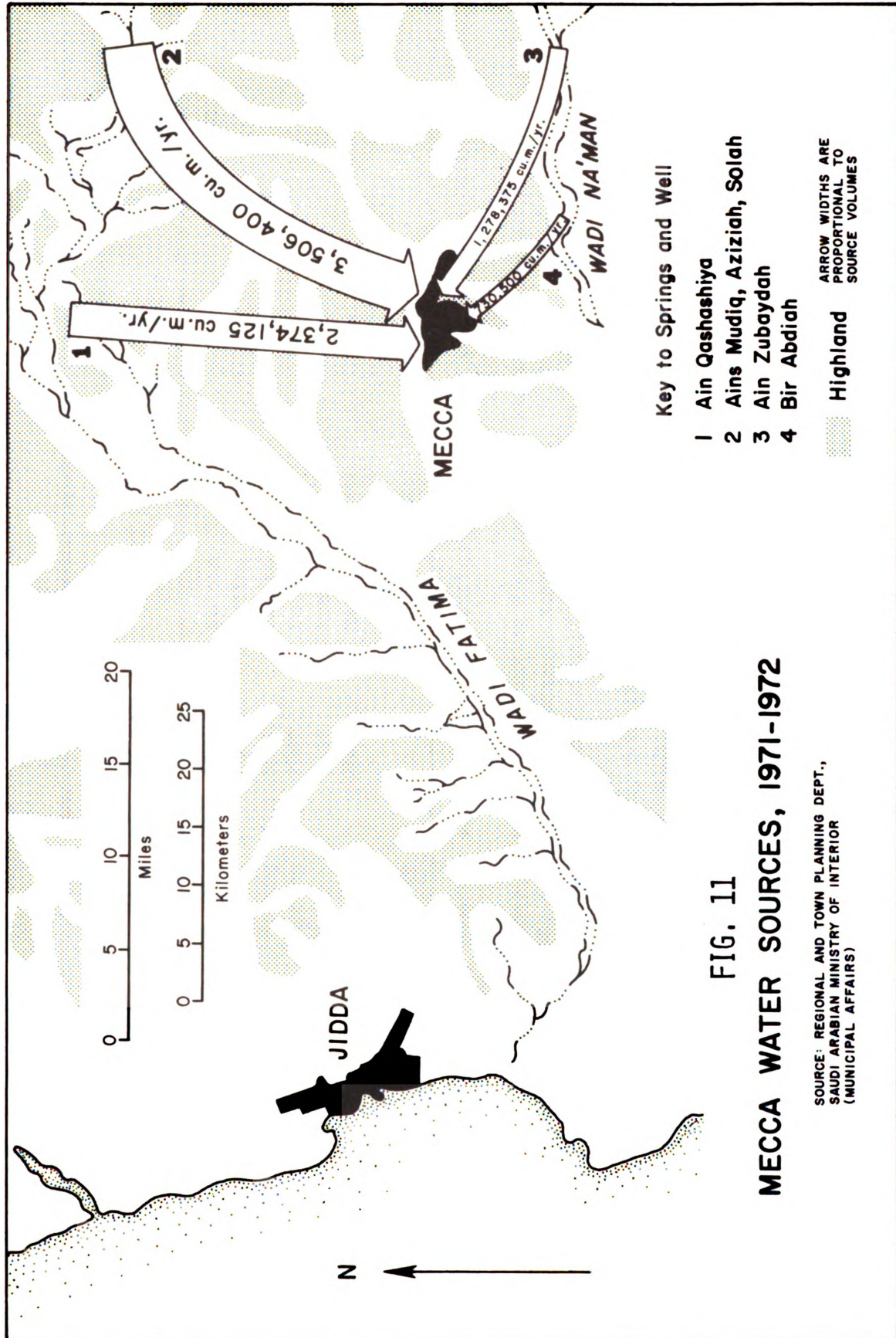


TABLE 2. WATER RESOURCES

Name	Notes	Type of Source	Average Yield M <sup>3</sup> /day	Valley	Notes	Water Depth in Wadi/metre	Water Layer Thickness in metre
Ain Zubaydah	A	Spring	3500	Na'man		25	10
Ain Aziziah	B	Spring	2600	Fatima	F		
Ain Mudig	C	Spring	5000	Fatima	F		
Ain Solāh	D	Spring	2000	Fatima	F		
Ain Qashashiya		Well	6500	Fatima	F		
Bir Abdiah		Well	2000	Na'man		10	30
Private Wells	E	Well					
		Valley		Oshar	G	12	13

A--Partly plastered masonry aqueduct about 45 km long carries flow to city, yields about 3600 M<sup>3</sup> (about 660 gallon/minute).

B--Ancient name is Ain al-Jadīdah. It was built during King Abdulaziz Period, Father of present King. Reached Mecca in 1951 by Ministry of Finance Authority.

C--King Sa'ūd, brother of the present king, bought half of this spring. Its water reached Mecca in 1957 by Ministry of Finance Authority.

D--Local farming consumes similar quantity from same source.

E--In Mecca there are about 200 private wells supplying about 40,000 people with their daily water needs.

F--The cultivated areas within this valley are decreasing since much of the water must be used for drink.

G--This small valley runs from Northeast to Southeast at about 32 km from Mecca.

\*Source of data: Alternative Urban Strategies, Regional and Town Planning Dept., p. 59; and data from the Ministry of Agriculture.

and the water comes to the city by aqueduct, truck, and pipeline. As a result the entire quantity of water available does not reach the city without large losses; about a third to one half of all water extracted from local ground water resources is lost because of the existing distribution methods and facilities within the city and inefficient use of the pipelines.

As a result of the above information it can be assumed that Ain Zubaydah Authority is only able to provide some  $13,000 \text{ m}^3/\text{day}$  for consumption in Mecca. Considering that the population of the Holy City is 301,000, the per capita daily consumption of water in Mecca is accordingly 66 litres including wastage, or 43 litres excluding wastage.<sup>16</sup>

These statistics reveal that the city has a critical water shortage and that large numbers of people are living on near minimal quantities daily. During the pilgrimage, the problems of water supply become very severe.

The per capita daily consumption of water in Mecca must decrease to an estimated 14 litres including wastage or 9 litres excluding wastage, based on 1.5 million

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<sup>16</sup>Alternative Urban Strategies, pp. 59 and 88.

pilgrims in 1975. This indicates that neither the pilgrims nor the citizens have enough water as the water available cannot satisfy their daily needs.

In conclusion:

1. Mecca and its population have a critical shortage of water.
2. The methods of distributing the water to the inhabitants in Mecca needs to be changed or improved by using proper pipelines, and otherwise improving the water distribution system.
3. Since the Red Sea is about 70 km from Mecca it is possible to refine enough water for Mecca's needs by desalinization. Or is it possible to shift the quantity of water that the city of Jiddah gets from Wadi Fatima to Mecca, and supply Jiddah by refined water.
4. In order to protect the people who consume the water a system of chlorination and water examination should be established.

### The Pilgrimage

According to the Koran every Muslim is required to observe the Five Pillars of Islam: to profess that there is no God but Allah and that Mohammed is his prophet; to pray five times daily; to give alms; to fast during the month of Ramadān; and to make the Pilgrimage--known as the Hajj--to Mecca at least once in a lifetime if at all possible.

### The Hajj Rites<sup>17</sup>

The Hajj--the Pilgrimage to Mecca--is essentially a series of rites performed in Mecca, and in nearby Arafat, Muzdalifah, and Mina.

The Hajj must be made between the eighth and the 13th days of the 12th month, Dhu al-Hijjah, of the Muslim lunar year.

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<sup>17</sup>This discussion is summarized from Aramco World Magazine (November 1974).

Donning the Ihram.<sup>18</sup>--This is the first step toward performing the pilgrimage. At the moment of donning the Ihram the pilgrims enter a state of grace and purity in which they may not wear jewelry or perfume or other personal adornment.

Performing the Ṭawāf.--The pilgrims then proceed directly to the Holy Mosque to circle the Ka'aba. The Ṭawaf is the act of circling the Ka'aba on foot seven times.

After the pilgrims perform the Ṭawaf, they perform the Sa'y (the running) where they run between the hills of al-Safa and al-Marwa, where Hagar searched for water for her child. She ran desperately back and forth seven times between the above hillocks, until the angel Gabriel appeared and, stamping the ground with his heel, brought water for her and her child. This is the origin of the well of Zam Zam. Pilgrims also run seven times in commemoration of this event.

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<sup>18</sup>The Ihram is a white seamless garment. For men this garment consists of two lengths of white material, one covering the body from waist to ankle, the other thrown over the shoulder. For women it is customarily a simple white gown and a head covering without a veil.

Going to Mina and Arafat.--On the eighth day of Dhu-al-Hijjah the Pilgrim begins the main rites of the Hajj by going to Mina, where he prays five prayers and then moves to Arafat. He may go directly to Arafat, however, where he must stay until the sunset of the ninth of Dhu-al-Hijjah. This period at Arafat is called the day of standing and this action is the single most essential act during the pilgrimage.

In Arafat there is a hill called the Mount of Mercy, at the bottom of which the prophet Mohammed delivered his farewell sermon during his own pilgrimage. It is this event which the "standing" at Arafat commemorates.

Toward Muzdalifah.--After sunset the pilgrims proceed en masse from Arafat to a place called Muzdalifah a few miles back toward Mina. In Muzdalifah the pilgrims worship and sleep. There they gather a number of pebbles for use during the rites on the following days.

Going to Mina.--After midnight of the ninth day, the pilgrims move from Muzdalifah to Mina, where they remain for three days. There they throw on the first day



seven pebbles at one of three whitewashed, rectangular masonry pillars. The pillars which they stone on this occasion represent devils. The largest of the three pillars represents Satan himself who three times tried to persuade Abraham to disobey God's command to sacrifice his son. The throwing of the pebbles symbolizes the pilgrims' repudiation of evil.

On the succeeding days the pilgrims throw 21 pebbles a day at the pillars.

Īd al-'adhā.--The feast of sacrifice starts the morning of the tenth day of Dhu-al-Hijjah, that is, the first day at Mina, where the pilgrims who can afford to sacrifice a sheep, cow, goat or other animal. Some pilgrims share in the sacrifice of a single animal. They all give a portion of the meat to the poor.

The sacrifice has several meanings: It commemorates Abraham's willingness to sacrifice his son. It symbolizes the believer's preparedness to give up what is dearest to him. It marks the Muslim renunciation of idolatrous sacrifice. It offers thanksgiving to God. It reminds the pilgrim to share his blessings with those

less fortunate. Muslims all over the world are on the same day performing an identical sacrifice, and thus vicariously sharing in the elation of the pilgrims in Mecca. The sacrifice is therefore an integral part of a worldwide Muslim celebration that unites those on the Hajj with those elsewhere.

Releasing from the Ihram.--After completion of the rites at Mina, the pilgrims have completed a major part of the Hajj. Both men and women now cut off or clip some of their hair. For men it is recommended that they have their heads shaved. At this point the pilgrims may remove the Ihram.

Tawāf al-Ifāḍah.--All pilgrims now go to the Holy Mosque and circle the Ka'aba a final seven times; this is called Tawāf al-Ifadah. Then the pilgrims return to Mina for three days. All of the rites of the Hajj are now completed and the atmosphere is more relaxed.

Departure.--After the three days at Mina pilgrims are free to return home after they return for a farewell Tawāf in Mecca. This final Tawāf is called the Tawāf al widā'.

A total of 1,557,867 pilgrims performed the pilgrimage in December 1975, exceeding the 1974 total by 72,892 pilgrims. Of the total, 306,159 pilgrims were from Saudi Arabia; 357,165 pilgrims were non-Saudi but residing in Saudi Arabia; the other 894,573 pilgrims came from outside Saudi Arabia. Of the latter number 584,593 were male and 299,980 were female.<sup>19</sup>

To accommodate the increasing numbers of pilgrims, the Saudi Arabian Government has made changes in facilities, and has even made important changes in Al Masjid Al-Harām itself. The mosque has been enlarged from 29,000 square metres in 1375 A.H. (1956 A.D.) to 190,000 metres in 1976. The Mosque can now accommodate 600,000 worshippers at one time. This expansion includes the construction of Al-Masa'a where the Sa'y, or running takes place. Al-Masa'a is a 395 metre long wing of the Mosque. Both floors of Al-Masa'a were used for the Sa'y in 1975 because of the large number of pilgrims.<sup>20</sup>

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<sup>19</sup> Oil Caravan (newspaper published by ARAMCO in Dhahran) January, 1976.

<sup>20</sup> Data provided by the administrative office of the Mosque Improvement Project [Mashrū' al-Harām], Mecca.

Al-Masjid Al-Harām is a magnificent structure.

It has seven minarets, each extending 92 metres above ground. The mosque is decorated with geometric work in metal, mosaic tile, and carved plaster; the majority of the Mosque is painted white. The cost of reconstruction of the Mosque amounted to one billion Saudi Riyals.

On the following pages is a series of photographs illustrating the Al-Masjid Al Harām, Mecca and its situation, examples of housing and accessibility, and important sites of the pilgrimage. (Plates 1-10)



PLATE 1.--The Tent City around the village of Mina. This picture faces West. The Holy Mosque of Mecca is beyond the mountains in the upper left of the photograph.





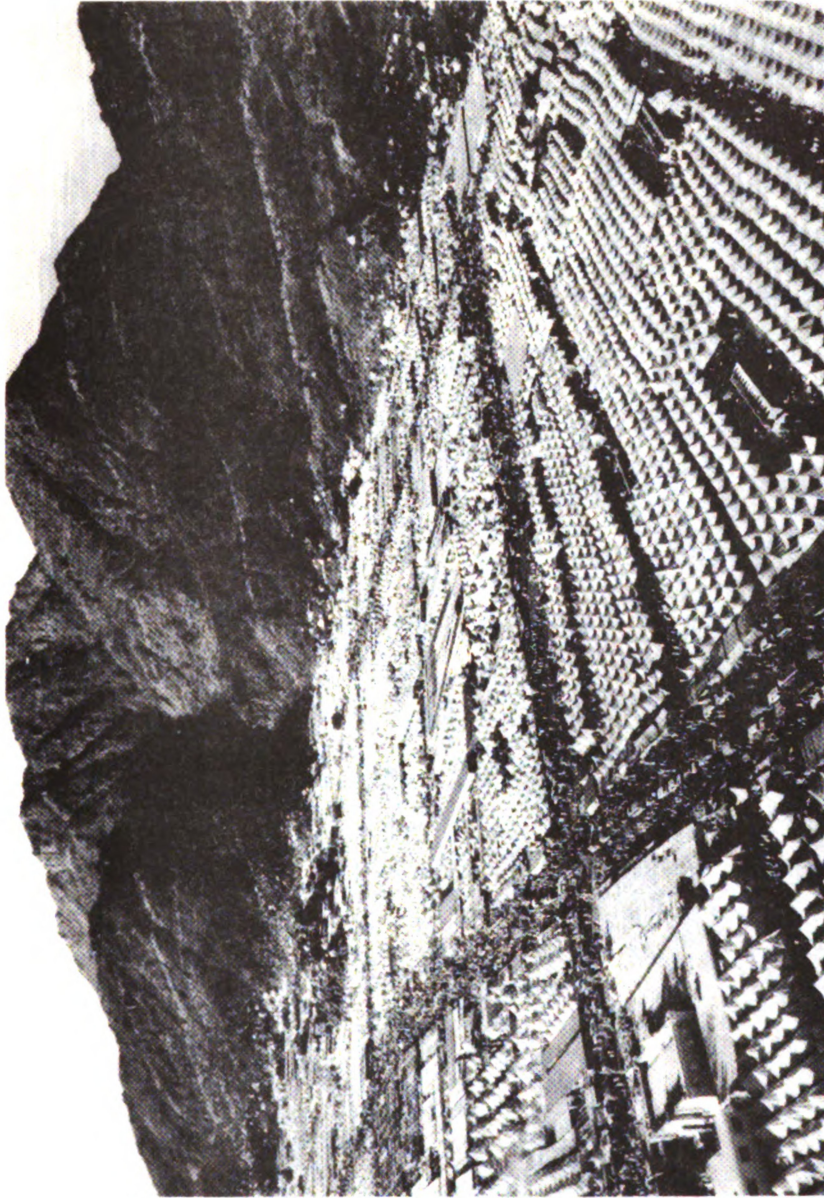


PLATE 2.--The Tent City at Mina, facing Southeast,  
during the height of the pilgrimage.



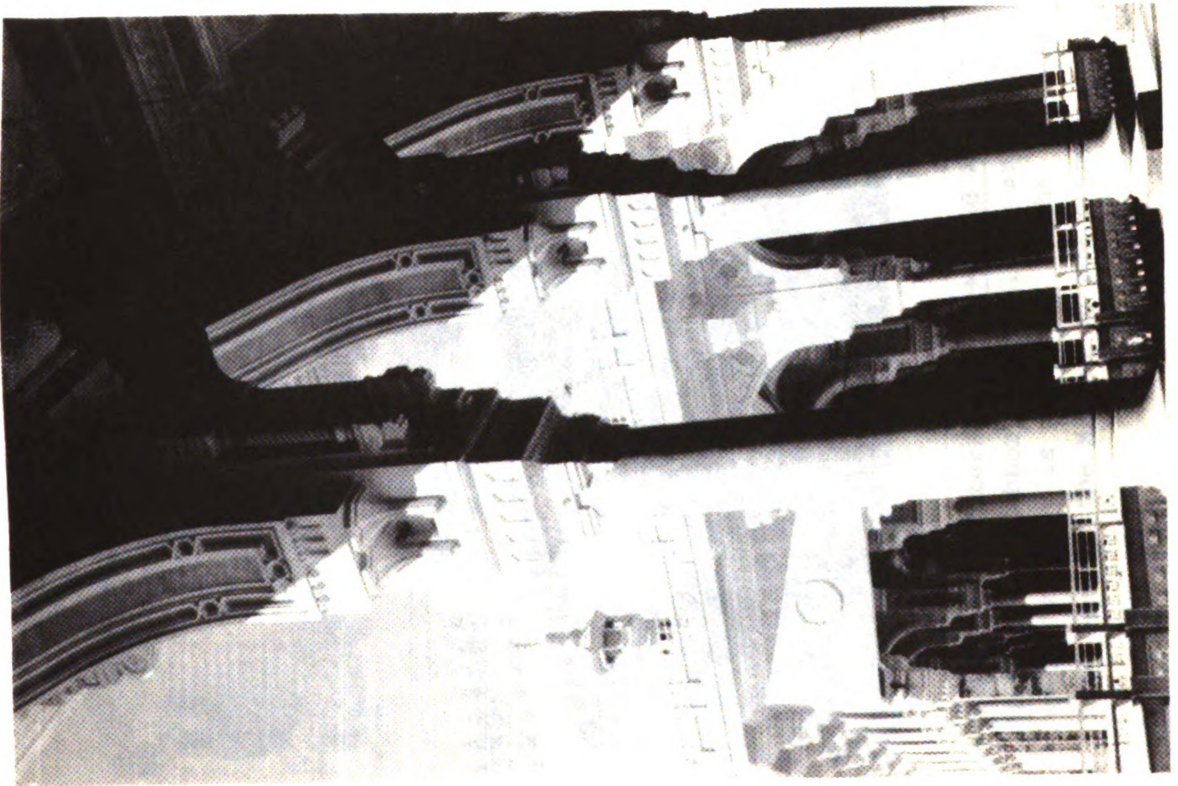
PLATE 3.--Pilgrims moving to AraFat.



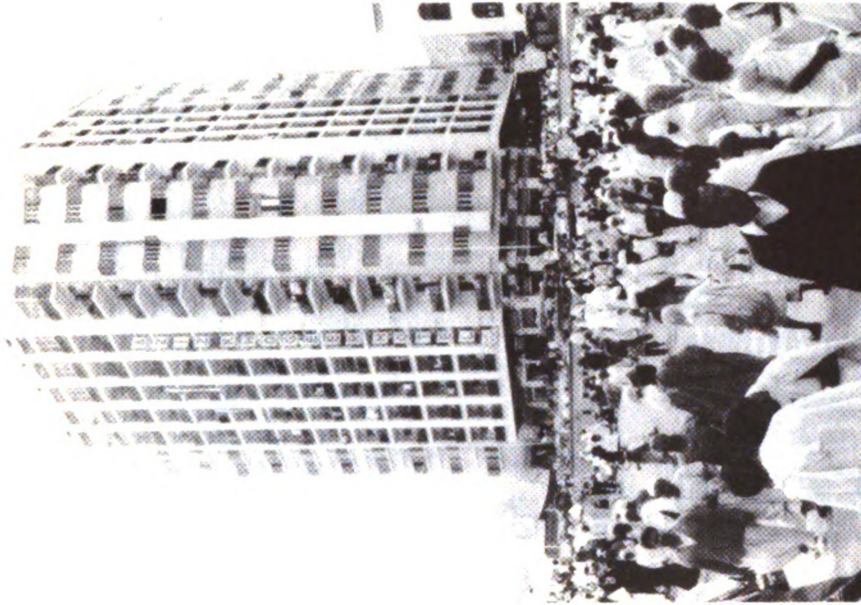


PLATE 4.--A typical tent accommodation at AraFat being dissembled  
at completion of this rite.

PLATE 5.--View of part of  
the interior of  
Al-Masjid Al-Harām

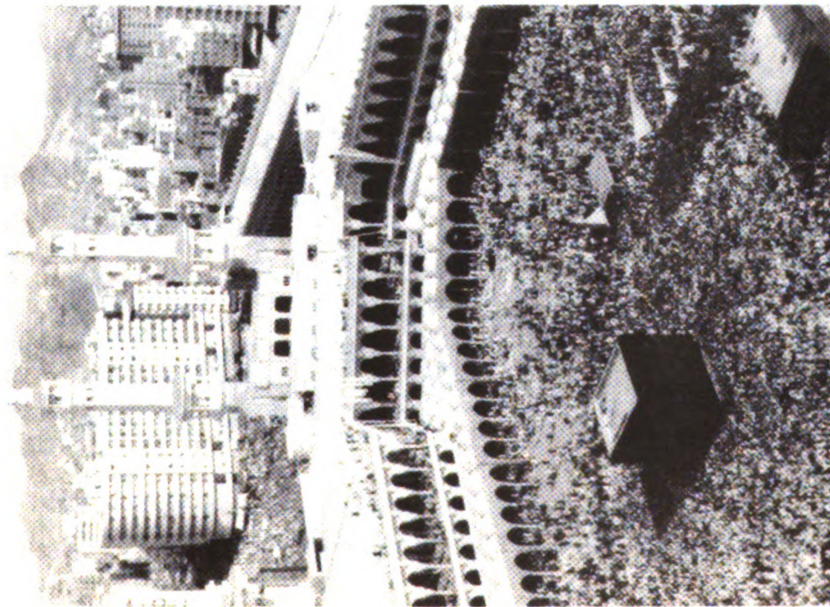






6B.--A pilgrim hotel adjacent to  
Al-Masjid Al-Harām.

PLATE 6



6A.--View of the interior of Al-Masjid Al-Harām and neighboring Mecca. The area where the Sa'y is performed is the long wing of the Mosque on the right.



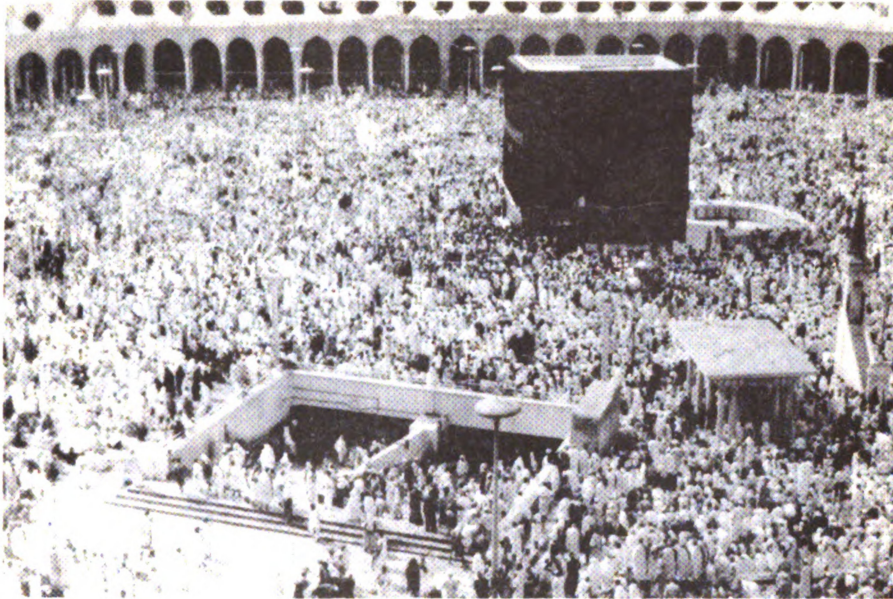


7A.--View of Mecca and the minarets of Al-Masjid Al-Harām.  
The role of topography in controlling the extent of  
the built-up area is evident.

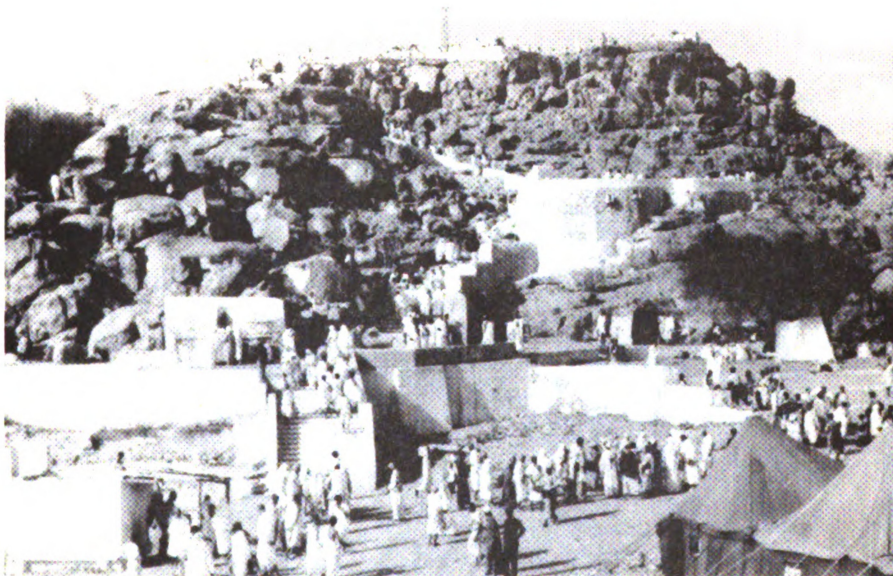


7B.--The recently enlarged square outside Al-Masjid Al-Harām  
--crowded with pilgrims during the time of the Hajj.



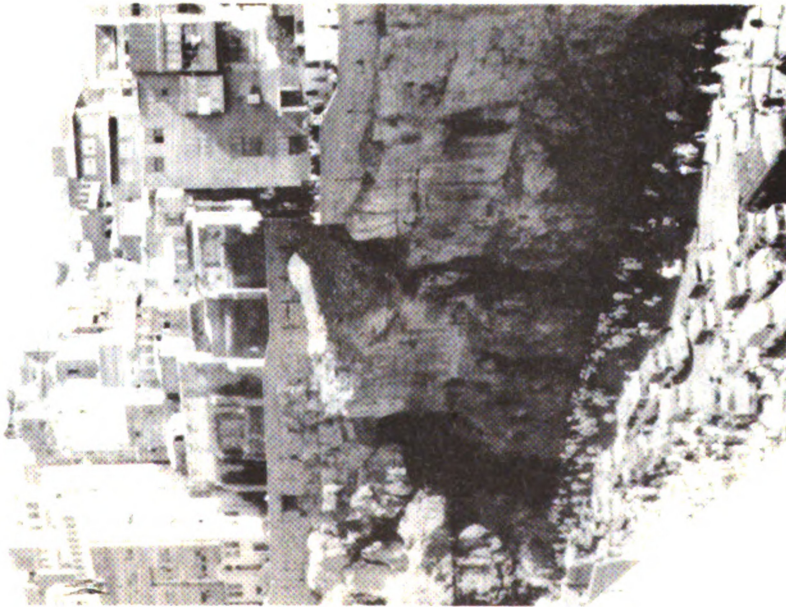


8A.--Interior of Al-Masjid Al-Harām. Pilgrims around the Ka'aba, with the entrance to the well of ZamZam in the foreground.

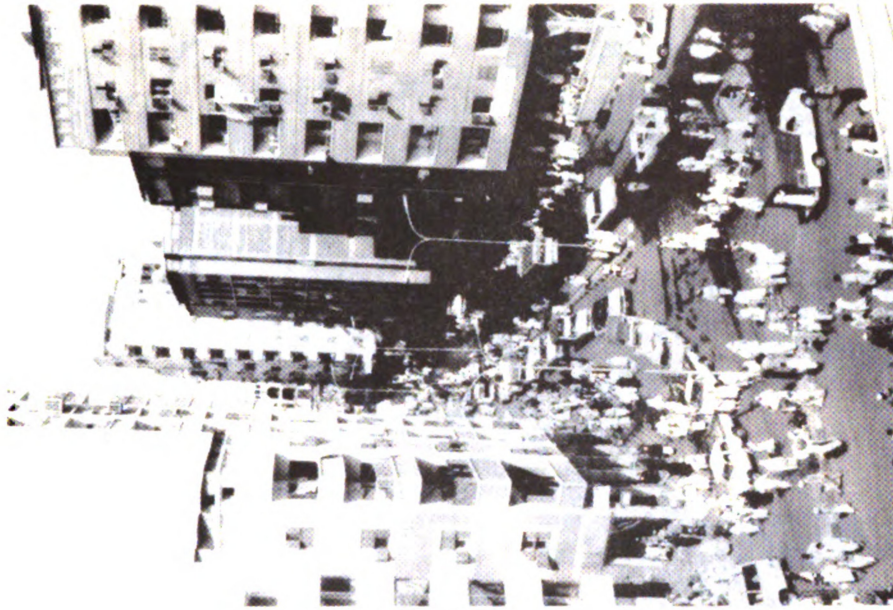


8B.--The Mount of Mercy, Arafat. This picture was taken two days before the start of the pilgrimage.

## PLATE 9

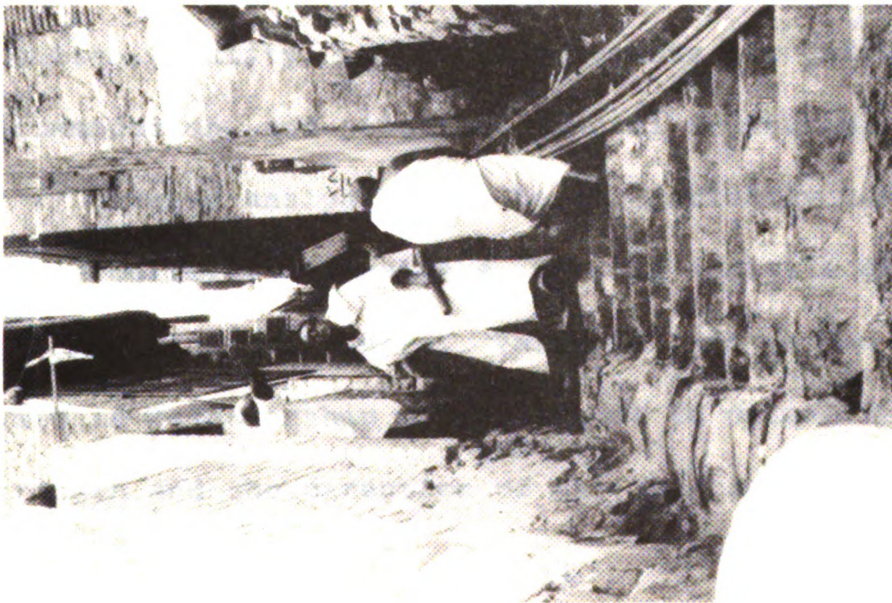


9A.--Housing adjacent to Al-Masjid  
Al-Harām, without easy accessi-  
bility.



9B.--Easy accessibility and high quality  
accommodations in an area of high  
relief in Mecca.





10A



10B

PLATE 10.--Narrow passageways and stairways in Mecca, illustrating problems of accessibility within the city. (A) Locations such as these are at a very short distance from Al-Masjid Al-Harām. (B) Group of pilgrims minimizing distance to the Holy Mosque by taking shortcuts with difficult access.

### CHAPTER III

#### SPATIAL DISTRIBUTION OF PILGRIM HOUSING

In this chapter, the spatial distribution of pilgrims' accommodations is discussed. The discussion will also focus on the characteristics of pilgrims' accommodations with respect to the four types of rentals (pilgrim leaders, pilgrim agents, occupants, and owners), and accessibility to the Holy Mosque.

Such discussion will be analyzed according to the following specific variables which determine the characteristics of the accommodations: distance from the Holy Mosque, elevation from the sea level, rent cost of accommodation, quality, number of occupants per unit, size of accommodation, and pilgrims' general attitudes.

These analyses will be statistically tested by simple correlation analysis, one way analysis of the variance, and chi square. Variables are paired and analyzed in relationship to each other to determine the strength and the direction of the relationship (Table 3).



TABLE 3. SIMPLE CORRELATION COEFFICIENTS

VARIABLE		ELE- VA- TION	RENT COST	QUAL- ITY	TOTAL COM- PLAINTS	ACCOM. SIZE	NUMBER OF PERSONS
Distance	r	-.435	.089	.313	-.200	.063	-.179
	sig.	.001	.094	.001	.001	.174	.01
Elevation	r		-.235	-.035	.146	-.084	.120
	sig.		.001	.301	.05	.106	.05
Rent Cost	r			.188	.077	.316	.169
	sig.			.05	.126	.001	.05
Quality	r				-.121	.235	-.241
	sig.				.05	.001	.001
General Complaints	r					-.045	.046
	sig.					.252	.249
Accom. Size	r						.3954
	sig.						.001

N - 222.

### Distance: Analysis and Discussion

#### Distance and Rent Cost

The test results show no significant relationship between distance from the Holy Mosque and rent cost per accommodation. The correlation coefficient was only .0890.

The hypothesis, that there is a positive relationship between the rent and distance from the Holy Mosque, is rejected. No significant relationship exists between distance and rent cost due to the fact that certain pilgrims of different nationalities are recommended by their Health Missions to live away from the city center in the outskirts, where most of the houses are new and belong to rich people. For this reason the rent per accommodation is expected to be higher than other accommodations within the city, except those of high quality near the Mosque. In conclusion, rent is high for accommodations which are close to the Holy Mosque and have high quality; then rent goes down for accommodations away from the mosque; and increases in the outskirts because of the quality of the accommodations.

### Distance and Quality

There is a significant positive relationship between distance from the Holy Mosque and the quality of accommodations. The result supports my hypothesis of a positive relationship. Also this relationship suggests the proposition that Mecca's urban structure is similar to the industrial city.

The city center in most Arabian Muslim towns is the old city which is characterized by traditional construction. As one moves from the center toward the outskirts one will notice a difference in building construction and quality. However, in the case of Mecca the center of the city is being altered in appearance. Recently, many of the old houses located near the Mosque (approximately 2473 houses costing over \$86 million)<sup>1</sup> were removed in order to enlarge the Mosque and build new roads. Some new housing was constructed in the center of the city, altering the relationship between distance and quality with the raise in quality of the city center.

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<sup>21</sup> Data provided by the administrative office of the Mosque Improvement Project [Mashrū' al-Harām], Mecca.

### Distance and Total Complaints

There is a negative relationship between attitudes, as measured by the total number of complaints and distance from the Holy Mosque. The correlation coefficient is  $-.200$  and supports my hypothesis. This negative correlation is due to:

1. Most of the pilgrims are very conservative when explaining their attitudes toward the pilgrimage.
2. Since most of the pilgrims are very anxious to perform the pilgrimage, they believe that anything which happens to them in Mecca is acceptable because it might be their last visit.
3. All Muslims believe that the credits they will get in the "hereafter" are related to how much they suffered to perform their pilgrimage.

### Distance and Accommodation Size

There is no significant relationship between distance from the Holy Mosque and accommodation size. The correlation coefficient is  $.0633$ . The results lead to a rejection

of the hypothesis, which is that there is a positive relationship.

No relationship appeared between the two variables due mainly to the new houses which were built near the Mosque after removal of the old houses. Also the lack of a relationship is due to the fact that most of the rooms in old and new buildings are consistent in size, whether the housing is old or new.

#### Distance and Number of Persons Per Accommodation

A negative relationship exists between the number of persons per accommodation and distance from the Mosque. The results support my hypothesis of a negative relationship.

This result relates to the fact that rent is very high in the accommodations which are close to the Holy Mosque. For this reason certain pilgrims tend to cluster together in order to reduce the cost per person. Also it is related to the fact that the pilgrim agents are located close to the Mosque, where they try to fit in the

accommodations as many people as they can to secure benefit for themselves.

### Elevation from the Sea Level

#### Elevation and Rent Cost

A significant negative relationship exists between rent per accommodation and elevation from the sea level. The result supports my hypothesis of a negative relationship.

The relationship is low because there are some accommodations located at high altitude but close and easily accessible to the Holy Mosque. These accommodations have a high rent cost.

#### Elevation and Quality

No significant relationship exists between quality of accommodation and elevation from sea level. The hypothesis, that a negative relationship exists between quality and elevation, is rejected.

The result of no significant relationship between the above variables is not easily explained, but might relate to the following:

1. The nature of the sample design.
2. Lack of sufficient information to measure quality.

From personal observation, low quality of accommodations located at high altitude with no vehicle accessibility is the general rule.

#### Elevation and General Attitudes

A significant positive relationship exists between attitudes, as measured by complaints, and elevation from sea level. The result supports my hypothesis of a positive relationship.

The positive relationship is probably explained by the general lower quality of residents in higher elevation areas.

### Elevation and Accommodation Size

No significant relationship exists between accommodation size and elevation from sea level. The hypothesis is rejected that there is a significant negative relationship. Accommodation sizes are uniform in Mecca.

### Elevation and Number of Persons

A significant positive relationship exists between the number of persons per accommodation and elevation from sea level. The hypothesis is rejected that there is a negative relationship between the above variables.

This result is related to the following:

1. Some nationalities, such as the Yemenis, are used to living in mountains and, furthermore, cluster together to reduce the cost of housing.
2. Other pilgrims find that the accommodations offered by the pilgrim agents was higher in cost than they expected. For this reason they preferred to rent accommodations from those of their own nationality who are living in Mecca. Those people are mostly



located in the mountains surrounding the Mosque, such as 'Umar Mountain. Many of these pilgrims came from Afghanistan and Pakistan.

Also, there are accommodations located at high altitude which have high quality and easy accessibility to the Holy Mosque; these accommodations have a high rent cost, which means that more people share the cost.

#### Rent Cost of Accommodation: Analysis and Discussion

##### Rent Cost and Quality

A significant positive relationship exists between rent cost per accommodation and quality of accommodation. The results support my hypothesis of a positive relationship.

The relationship between the above variables is low, yet significant, because the accommodations which are located close to the Mosque have high rent cost due to location regardless of quality. In contrast, there are some accommodations of higher quality located within the city

not near the Mosque, but which at the same time have lower rent cost.

#### Rent and Pilgrims' Attitudes

No significant relationship exists between rent per accommodation and pilgrims' attitudes. The results are surprising, and result in the rejection of the hypothesis that there is a positive relationship.

No significant relationship is shown due, for example, to the fact that the pilgrims from Persia pay about the highest amount of rent overall, but most of them do not complain because the Persian government helps them financially to perform the pilgrimage. Other pilgrims pay high rents but share the cost with others by living together. Furthermore, pilgrims anticipate the high rents, and accept them as a normal part of the pilgrimage.

#### Rent Cost and Accommodation Size

A significant positive relationship exists between rent cost per accommodation and size of accommodation. The results support my hypothesis of a positive relationship.

However, the results show a low correlation between the variables because in the area surrounding the Mosque accommodations of small size could be expected to rent for high prices; while away from the Mosque, especially in the outskirts where the Persian pilgrims prefer to live, accommodations are valued for their size.

#### Rent Cost and Number of Persons

A significant relationship exists between rent cost per accommodation and number of persons living in an accommodation. The result supports my hypothesis. However, the correlation between these variables is low due to the following:

1. Most of the accommodations are rented as a unit--not by individual persons.
2. In the case of the pilgrims from Persia, each person has a specified minimum size of accommodation. This size requirement will not be changed whatever the accommodation cost.

### Quality of the Accommodation: Analysis and Discussion

#### Quality and Pilgrims' Attitudes

A significant negative relationship exists between quality of accommodations and the pilgrims' attitudes. The result supports my hypothesis of negative relationship.

The tests show a low correlation between these variables because pilgrims in general do not care about the quality or the price they pay for the very short period that they will stay in Mecca.

#### Quality and Accommodation Size

A significant positive relationship exists between quality and size of accommodation. The result supports my hypothesis of a positive relationship. Although there is not a great range in accommodation size, larger accommodations tend to be found in newer, higher quality housing.

#### Quality and Number of Persons

A significant negative relationship exists between quality of accommodation and number of persons living in an

accommodation. The results support my hypothesis of negative relationship.

### General Attitudes: Analysis and Discussion

#### General Attitude and Accommodation Size

No significant relationship exists between pilgrims' total complaints and size of the accommodations. The results refute any hypothesis, which is that there is a positive relationship between the two variables.

#### General Attitudes of the Pilgrims and Persons per Accommodation

No significant relationship exists between persons per accommodation and pilgrims' total complaints. The results refute my hypothesis which is that there is a positive relationship.

### Number of Persons and Accommodation Size

A significant positive relationship exists between number of persons per accommodation and accommodation size. The results support my hypothesis of a positive relationship.

### Accessibility to the Holy Mosque

The discussion in this section focuses mainly on on the location of the accommodations, i.e., whether or not they have easy accessibility to the Holy Mosque. Such locations could affect the characteristics of the accommodations such as rent cost, quality, number of occupants in an accommodation, and accommodation size.

### Accessibility by Rent Cost

The test results show significant differences between rent cost per accommodation and accessibility to the Holy Mosque (See Table 4). The results support my hypothesis which is that there are significant differences between rent and accessibility to the Holy Mosque.

TABLE 4. ANALYSIS OF VARIANCE RESULTS BASED ON AN ACCESSIBILITY DICHOTOMY AND ACCOMMODATIONS' CHARACTERISTICS

Accommodations' Characteristics	Easy Access <sup>a</sup>		Diff. Access <sup>b</sup>		F Ratio	F Prob.
	Mean	S.D.	Mean	S.D.		
Rent Cost per Accom.	1745.6	1916.09	715.6	962.17	22.87	.000*
Quality of Accom.	5.32	1.71	5.14	1.43	.679	.411
No of Persons per Accom.	7.10	3.79	7.82	3.46	2.10	.149
Accommodation Size	55.44	24.95	49.21	22.67	3.672	.057

a = n = 127; b = n = 95

\*Significant at .001 level.

By looking at the mean cost per accommodation we find that in the case of easy accessibility to the Holy Mosque the mean rent cost of an accommodation is \$1745.60, while in the case of lesser accessibility it is \$715.60.

This remarkable difference between the two rates relates to the fact that most pilgrims care more about the location of their accommodations, and also to the fact that the sponsors of these houses take into consideration the location of their accommodation when they determine rent values.

### Accessibility and Quality

The test results do not show any significant differences between quality of accommodation and accessibility to the Holy Mosque (see Table 4). The result of the test refute my hypothesis, which is that there are significant differences between quality of accommodation and accessibility to the Holy Mosque.

No significant differences between quality and accessibility could be explained by the following:

1. Methods that were used in determining the accessibility were not equivalent.<sup>2</sup>
2. Most of the houses in Mecca, especially those in the center of the city, have the same quality regardless of their locations from the main streets. This does not in most cases include the new buildings.

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<sup>2</sup>See definition of accessibility.



### Accessibility by Number of Persons

The test results do not show any significant differences between number of persons per accommodation and accessibility to the Holy Mosque (see Table 4).

The results support my hypothesis of no significant differences. These results could be related to the fact that more people share the accommodations with maximum rent, making the rent cheaper per person.

### Accessibility by Size of Accommodation

The test results do not show any significant differences between accommodation size and accessibility to the Holy Mosque (see Table 4).

The results support my hypothesis of no significant differences.

Since none of the above variables except rent cost are affected by accessibility to the Holy Mosque, it is obvious that pilgrims are charged on the basis of location alone.

### Type of Rentals

Most pilgrims who come to Mecca to perform the pilgrimage reside in accommodations obtained through one of the following : pilgrim leaders, pilgrim agents, occupants of accommodations, or owners of the accommodations. The discussion in this section will focus mainly on the accommodations' characteristics as well as pilgrims' general attitudes related to the above rentals (see Table 5).

### Type of Rentals by Rent Cost

The test results show significant differences among pilgrims residing in the four types of rentals with respect to rent cost per accommodation, supporting my hypothesis of significant differences.

By looking at the average rent costs per accommodation in the four types of rentals we will find that the rent cost decreases in the following order: pilgrim leaders, pilgrim agents, occupants, and owners.

TABLE 5. ANALYSIS OF VARIANCE BASED ON ACCOMMODATION CHARACTERISTICS AND TYPE OF RENTALS

Accommodations' Characteristics	Type of Rental	n	$\bar{x}$	S.D.	F.Ratio	F.Prob.
Rent Cost	Occupant	13	733.85	897.64	7.17	.000 <sup>a</sup>
	Pilgrim Agent	98	1364.26	1278.39		
	Pilgrim Leader	44	2189.32	2774.07		
	Owner	51	709.84	835.29		
Quality	Occupant	13	4.7	.95	23.84	.000 <sup>a</sup>
	Pilgrim Agent	98	4.7	1.39		
	Pilgrim Leader	44	6.8	1.29		
	Owner	51	5.1	1.56		
Number of Persons	Occupant	13	7.3	2.98	3.11	.027 <sup>c</sup>
	Pilgrim Agent	98	8.1	3.99		
	Pilgrim Leader	44	6.2	2.89		
	Owner	51	7.1	3.75		
Distance	Occupant	13	866.2	994.09	15.50	.000 <sup>a</sup>
	Pilgrim Agent	98	591.4	564.29		
	Pilgrim Leder	44	1413.8	801.99		
	Owner	51	947.9	639.92		
Total Complaints	Occupant	13	1.5	1.56	.91	.437
	Pilgrim Agent	98	1.8	1.44		
	Pilgrim Leader	44	1.3	1.38		
	Owner	51	1.6	1.40		
Accommodation Size	Occupant	13	42.8	15.27	4.98	.002 <sup>b</sup>
	Pilgrim Agent	98	52.4	22.64		
	Pilgrim Leader	44	62.3	27.32		
	Owner	51	46.1	19.05		

<sup>a</sup>Significant at .001 level.<sup>b</sup>Significant at .01 level.<sup>c</sup>Significant at .05 level.

Pilgrim Leaders.--About 75% of the pilgrims who rent from pilgrim leaders are from Iran. Rent in this type of rental is high because the houses they rent are new and in good locations on the outskirts of Mecca. Pilgrims who reside with pilgrim leaders are able to pay for good accommodations, since some of them get financial aid from their governments, and the others are financially able to pay pilgrimage expenses themselves. This system enables pilgrim leaders to provide good accommodations for their pilgrims at good benefit to themselves, since most of the leaders prepare accommodations ahead of pilgrimage time to be sure they have good accommodations with good prices.

Pilgrim Agents.--One of the main jobs of a pilgrim agent is to prepare a comfortable accommodation for their pilgrims. The rent is high for housing provided by pilgrimage agents for the following reasons:

1. The location of their accommodations is very close to the Mosque.

2. These agents' income derives mainly from the pilgrimage period, that is about one month out of the entire year.
3. The pilgrims have the right to choose the kind of accommodations and the price they want to pay.  
For this reason the pilgrim agents could not rent their kind of accommodation at the prices they want ahead of time, as the pilgrim leaders do.

Owners and Occupants.--In the case of these two types of rentals the accommodations are cheaper because most of the families do not mind sharing their accommodations with pilgrims. This gives them a chance to know more about other people in other parts of the globe and also to help them financially in the cost-of-living which becomes very high during the pilgrimage time. A lower rental cost still represents important income for them.

#### Type of Rental by Quality

The test results show significant differences among pilgrims living in the four types of rentals with respect to quality of accommodation. The results support

my hypothesis of significant differences. By looking at the mean quality of accommodation in the four types of rentals we find the following:

Pilgrim Leaders.--The accommodations in this type of rental have the highest quality. As discussed above, the pilgrims who live with the pilgrim leaders can afford to pay for the quality of their accommodations, which makes the leader able to rent the new houses in the new areas.

Also this relates to the fact that every leader must get approval from the health mission of his own nationality as to whether the accommodation is suitable. These missions come from each country to assist the Saudi Health Ministry in the care of their pilgrims.

Pilgrim Agents.--They have low accommodation quality for the following reasons:

1. The location of their accommodations are characterized by congestion, high rent cost, and mostly old houses. This is because they are located within a shorter distance from the Holy Mosque.

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2. The status of their pilgrims is reflected in the amount they can pay. Most of their pilgrims are illiterate, poor and unhealthy.

For the above reasons the pilgrim agent (in order not to pay from his own pocket) rents the accommodations that are suitable at the price that these pilgrims can afford.

Owners and Occupants.--Accommodations belonging to these two types of rental are mainly constructed for private residences. Most share the accommodations' facilities with the pilgrims during the pilgrimage period. The quality is therefore variable, with few accommodations in the lowest quality category.

Type of Rentals by  
Number of Persons

The test results show significant differences among pilgrims in the four types of rentals with respect to number of persons per accommodation, supporting my hypothesis of significant differences.



By looking at the mean number of persons living in accommodations we find the following:

Pilgrim Leaders.--The lowest number of pilgrims live in an accommodation. The minimum area that every pilgrim has in an accommodation is established by the health mission which comes with the pilgrims.

Pilgrim Agents.--In this type of rental there is no minimum fixed area for each pilgrim. All the pilgrims in an accommodation must organize themselves and establish their own area within the accommodation. This situation, discussed above, relates to financial circumstances of the pilgrims.

Owners and Occupants.--Most pilgrims who rent accommodations from owners or occupants rent them as a group who want to be together and they do not mind being congested for a short time, as long as the rent is less.

#### Type of Rentals by Distance

The test results show significant differences among pilgrims residing within the four types of rentals. By

looking at the mean distance of the accommodation from the Holy Mosque we find the following:

Pilgrim Leaders.--Pilgrims with this type of rental are living in accommodations located at a greater distance from the Holy Mosque, since most of their accommodations are located in the outskirts such as Al-Nuzha Maṣṣūr Street, and Al-Faisaliah. The health commissions of these pilgrims recommend the above areas since they are away from the pollution of the city center.

Pilgrim Agents.--Pilgrims with this type of rental are living in accommodations located close to the Mosque.

Owners and Occupants.--These accommodations are located between the outskirts and the city center. These locations and the quality of the accommodations are not attractive in most cases to either the pilgrim leaders or pilgrim agents, which might be the reason they rent their accommodations directly to the pilgrims.

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Type of Rentals by  
Accommodation Size

The test results show significant differences among the pilgrims living in the four types of rentals with respect to accommodation size which supports my hypothesis of significant differences.

By looking at the mean size of accommodation in each type of rentals we find the following:

Pilgrim Leaders.--The size of accommodation in this type of rental is higher than the other three types of rentals. As discussed above these accommodations are in new areas.

Pilgrim Agents.--The size of accommodations in this type of rental is smaller than in those of the pilgrim leader, mostly because the land values in central areas are more expensive than those in the periphery. For this reason the owners try to make use of every spot they have.

Owners and Occupants.--Accommodations belonging to these types of rentals are smaller than those in the other two types of rentals, because of the fact that in most

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cases the owner or occupant is sharing the house with the pilgrims, who receive the smaller rooms.

Types of Rentals by Pilgrims'  
General Attitudes

The test results do not show any significant differences among the pilgrims living in the four types of rentals with respect to total complaints. The test results lead to a rejection of the hypothesis, which is that there is a significant difference.

By looking at the mean of total complaints of the pilgrims living in the four types of rentals we find the following:

Pilgrim Leaders.--Pilgrims living in this type of rental do not complain as much as those pilgrims living in the other types of rentals.

Pilgrim Agents.--The pilgrims residing with the pilgrim agents have more complaints than those pilgrims living with other types of rentals.

Owners and Occupants.--Pilgrims who live in these two types of rentals complain but not as much as those

living with pilgrim agents but more than those living with pilgrim leaders.

Since the above discussion does not show what kind of complaint is noticeable in each type of rental, the following discussion will be focused on each complaint by each type of rental.

#### Types of Rentals by Types of Complaints

This section focuses on the pilgrims' attitudes, within each type of rental, toward congestion, cost of living, rent cost, lack of water, new system of dividing the pilgrims, and other complaints. In Table 6 a percentage breakdown by complaint within each of four rental categories is presented. A summary of the chi-square test is presented in Table 7. The analysis in the rest of this chapter refers to both of these tables. These results are summarized graphically in Figure 12.







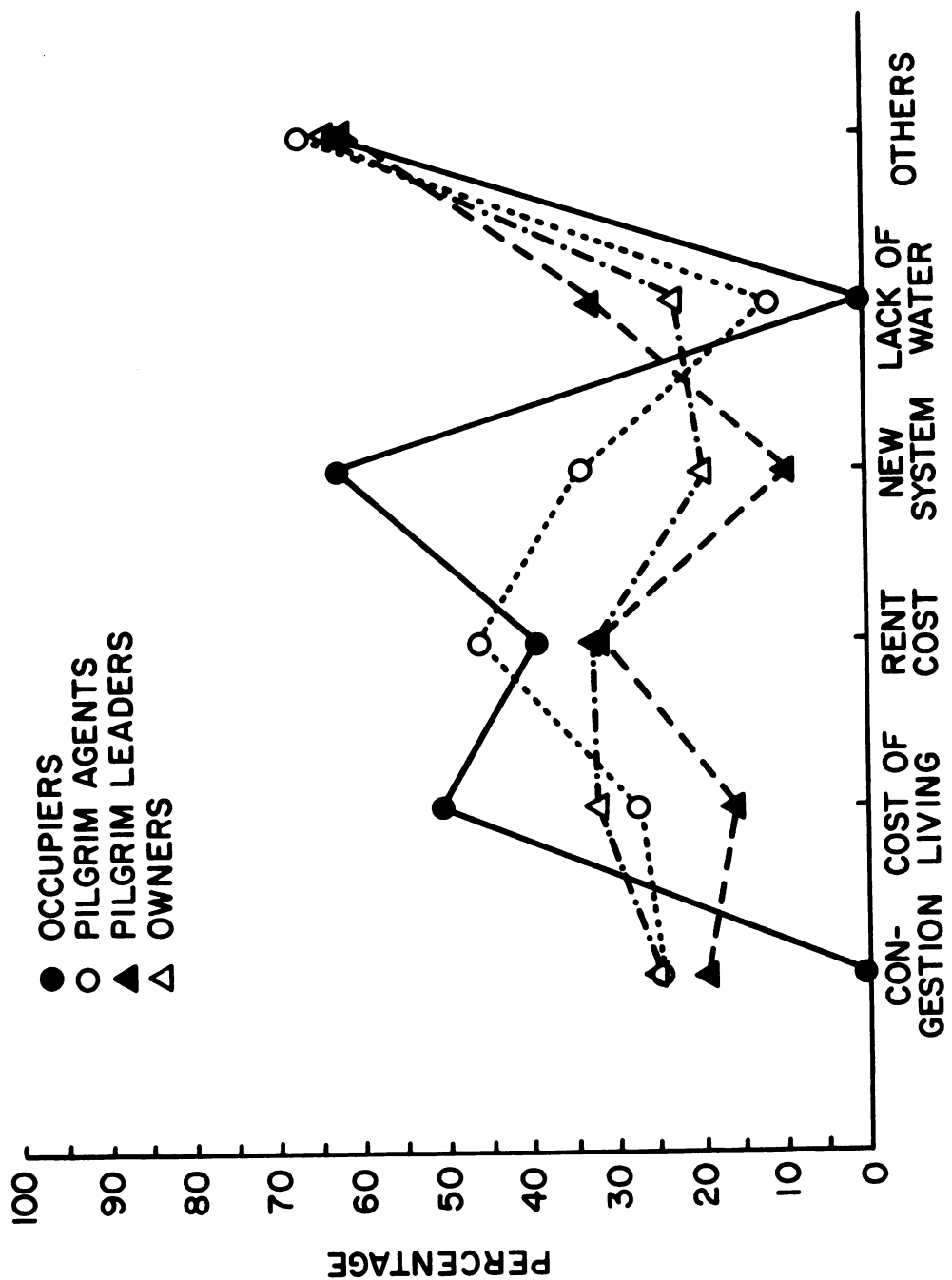
TABLE 7. TYPE OF RENTAL BY PILGRIMS' ATTITUDES:  
CHI SQUARE TEST RESULTS

	Con- ges- tion	Cost of Living	Rent Cost	New System of Dividing Pilgrims	Lack of Water	Others
$\chi^2$	2.937	4.972	4.429	13.986	10.825	.412
Degrees of Freedom	3.	3.	3.	3.	3.	3.
Sig.	.4015	.1734	.2187	.0029 <sup>a</sup>	.0127 <sup>b</sup>	.9378
n	160	160	205	160	160	160

<sup>a</sup>Significant at .01 level.

<sup>b</sup>Significant at .05 level.

FIG. 12  
PERCENTAGE OF COMPLAINTS BY TYPE OF RENTALS



### Type of Rentals by Congestion

The test results show no significant relationship among pilgrims residing within the four types of rentals with respect to congestion.

The results support my hypothesis. By looking at the percentage complaints of the pilgrims residing within each type of rental we find the following (see Tables 6 and 7).

Pilgrim Leaders.--Pilgrims living with the pilgrim leaders have a low percentage of complaints. This relates to the fact that most of them are residing away from the city center in the outskirts, and they are living in uncongested accommodations.

Pilgrim Agents.--Pilgrims who live with pilgrim agents have the most complaints compared with the other types of rental. This could be related to the following:

1. The pilgrim agents' accommodations are located in the city center where congestion reaches the peak.

2. Most pilgrims are living in congested accommodations.

Owners and Occupants.--Pilgrims who reside with the occupants do not complain about congestion, while some of those who reside with the owner did complain about congestion.

#### Type of Rentals by Cost of Living

The test results do not show any significant relationship among pilgrims residing within the four types of rentals with respect to the cost of living.

The results support my hypothesis of no significant relationship. By looking at the percentage complaints of the pilgrims living in each type of rental we find the following:

Pilgrim Leaders.--The percentage of pilgrims residing with pilgrim leaders complaining about the cost of living, is lower than those living in other rentals. The reason is that most pilgrims residing with the pilgrim leaders have already paid all the expenses required for

performing the pilgrimage including meals, often with assistance from their own country.

Pilgrim Agents.--The percentage of pilgrims renting from pilgrim agents, who complain about cost of living, is higher than for those living with pilgrim leaders because most of the pilgrims living with pilgrim agents are poor and living in the city center where everything is expensive compared with other parts of the city.

Owner and Occupant.--Pilgrims who reside with owners complain more than those living with pilgrim leaders or pilgrim agents; while in the case of the occupants, not very many pilgrims had comments about cost of living.

#### Type of Rentals by Rent Cost

The test results show no significant relationship among pilgrims living within the four types of rentals with respect to rent cost per accommodation.

The test results support my hypothesis of no significant relationship. By looking at the pilgrims residing within the four types of rentals we find the following:

Pilgrim Leaders.--The pilgrims who reside with pilgrim leaders complain about rent cost but not as much as those who rent from pilgrim agents. This result could be related to the quality of accommodation they get and to the arrangements which were made by their own country.

Pilgrim Agents.--The percentage of pilgrims who rent from pilgrim agents and complain about rent cost is higher than those living in the other rentals. Since the quality they get is less than what they paid in one hand and, in the other hand, the economic status of most of those pilgrims is low.

Owners and Occupants.--Pilgrims who reside with occupants complain about the rent cost, while those who reside with owners complain the least compared with other pilgrims living in other rentals.

#### Type of Rentals by the New System Of Dividing the Pilgrims

The test results show a significant relationship among pilgrims residing within the four types of rentals with respect to the new system of dividing the pilgrims.

The hypothesis is rejected that there is no relationship between the above two variables.

By looking at the percentage of pilgrims complaining about the new system of dividing the pilgrims, and who are living within the four types of rentals we find the following:

Pilgrim Leaders.--The pilgrims dealing with pilgrim leaders are not concerned with the new system, since their leaders contact and make all arrangements with the pilgrim agents.

Pilgrim Agents.--Some pilgrims who reside with pilgrim agents complain about the new system, although this system was established for their own benefit.

Owner and Occupants.--The pilgrims who reside in the accommodations belonging to occupants have the highest percentage of complaint about the new system, while those who reside with owners do not complain very much.



Types of Rentals by  
Lack of Water

The test results show a significant relationship among pilgrims residing within the four types of rental with respect to the frequency of lack of water.

The results support my hypothesis of a significant relationship.

By looking at the percentage of pilgrims in the four types of rental complaining about water supply, we find the following:

Pilgrim Leaders.--The percentage of pilgrims dealing with pilgrim leaders who complained about lack of water was higher than those living in other rentals. We have to consider the fact that the only pilgrims that consume a lot of water are the pilgrims who live with the pilgrim leaders, especially pilgrims from Iran. Because the pilgrim leaders are responsible for serving meals to their pilgrims, when the pilgrim leaders rent the accommodations they rent them with specific conditions such as:

1. The owners or the occupants who rent their accommodations to the pilgrim leaders must supply the pilgrims with all their water needs.

2. Half of the rent cost is kept with the leader until the end of the rent period. If the supplier of the accommodation does not provide the pilgrims with enough water, the leader has the right to buy water with the rest of the rent he has kept.

Pilgrim Agent.--The pilgrims who reside with pilgrim agents do not complain about a lack of water as much as those residing with pilgrim leaders although the amount available for them is much less than those with pilgrim leaders.

Owners and Occupants.--Pilgrims residing with owners have a high percent of complaints about lack of water, while those residing with the occupants do not complain about lack of water.

In conclusion, water is a critical problem in Mecca especially during the pilgrimage time when the population triples or quadruples. It is also a problem during non-Pilgrimage time as we discussed in the previous chapters.

Type of Rentals by  
Other Complaints

The test results do not show any significant relationship among pilgrims living within the four types of rental with respect to other complaints. The results support my hypothesis of no significant relationship.

In each type of rental, there were numerous complaints by pilgrims. The variety and uniqueness of these complaints and other expressions of attitudes makes it difficult to analyze the differences between rental units by specific complaints. The kinds of complaints are mentioned in the "Definition of Variables" section of Chapter One.

CHAPTER IV  
PILGRIM HOUSING AND NATIONAL ORIGIN  
IN MECCA

This chapter focuses mainly on the pilgrims themselves in terms of their nationalities and their spatial distribution within the city, as well as their distribution within the four types of rentals (pilgrim leaders, pilgrim agents, occupants and owners). Also, the characteristics of the accommodations with respect to the pilgrims' national origin is discussed. Such discussion will focus on such characteristics as distance from the Holy Mosque, accommodation size, number of occupants, quality of accommodation, and rent cost. In addition, the attitudes of the pilgrims toward the pilgrimage as a whole will be discussed according to the national origin of the pilgrims.

### Nationalities of Pilgrims

This section deals with the nationalities of the pilgrims in terms of their location with respect to the Holy Mosque, accommodation size, number of persons per accommodation, quality of accommodation, rent cost per accommodation, and their attitudes and complaints.

Since we are dealing in the following discussion with thirty-two nationalities, these nationalities are divided into two groups, according to whether they are above or below the mean values of each variable. These data are compiled and presented in Table 8 (Summary) and Table 9 (independent variables and mean for each nationality). All discussion in the following section derives from data given in these two tables.

TABLE 8. ANALYSIS OF VARIANCE RESULTS BASED ON  
DICHOTOMIZED INDEPENDENT VARIABLES  
AND NATIONALITIES

Variables	$\bar{x}$	S.D.	F.Ratio	F.Prob.
Distance	874.07	726.07	4.394	.000 <sup>a</sup>
Accommodation Size	52.77	24.15	1.586	.038 <sup>c</sup>
Number of Persons	7.41	3.66	1.259	.185 <sup>a</sup>
Quality	5.24	1.59	7.028	.000 <sup>a</sup>
Rent Cost	1307.49	1659.67	2.463	.000 <sup>a</sup>
General Attitudes	1.60	1.43	1.874	.007 <sup>b</sup>

<sup>a</sup> Sig. at .001 level; <sup>b</sup> sig. at .01 level; <sup>c</sup> Sig. at .05 level; N = 222.

TABLE 9. DISTRIBUTION OF MEAN FOR INDEPENDENT VARIABLES AND NATIONALITY

Nationalities	n	Distance <sup>1</sup>		Accom. Size <sup>2</sup>		Pers/Accom. <sup>3</sup>		Quality <sup>4</sup>		Rent Cost <sup>5</sup>		Attitudes <sup>6</sup>	
		above $\bar{x}$	below $\bar{x}$	above $\bar{x}$	below $\bar{x}$	above $\bar{x}$	below $\bar{x}$	above $\bar{x}$	below $\bar{x}$	above $\bar{x}$	below $\bar{x}$	above $\bar{x}$	below $\bar{x}$
Algeria	20		369.4	54.7		8.5		3.8		2025.4		2.1	
Egypt	22	888.8			50.7		7.1		5.3		678.6		2.4
United Arab Emirates	3		675.3		23.0		5.7		6.0		1047.3		.7
India	4		422.5		27.3		4.3		4.3		393.0		.8
Indonesia	17		624.5	56.4		7.9		5.6		717.4		1.1	
Iran	44	1456.8		63.8			6.1		7.1	2499.2			1.3
Iraq	7	1035.7			41.1		6.6						
Libya	22		376.1	63.2		8.6		4.6		371.3		2.0	
Morocco	3		490.7		42.0		4.7		4.5	2200.0		2.3	
Malaysia	3		408.3		39.0		7.3		4.7		799.7		1.7
Nigeria	23	1450.3			47.4	7.8		4.3		1133.3		1.3	
Pakistan	8		540.4		40.9	7.5		4.5		380.9		.8	
Saudi Arabia	3	1705.0		71.3			5.0		4.4	732.8		1.9	
Somalia	2		637.5		42.4	9.0		2.5		400.3		2.0	
Sudan	8		449.8		37.8	8.1		5.1		800.0		2.5	
Syria	7		415.9		49.0	8.6		5.3		308.8		1.9	
Turkey	12		768.7	55.7		9.6				1307.3		2.1	
Yemen	3	1355.0			44.0	10.0		5.2		1154.2		.9	
Others	11		598.5		43.78		6.1		4.0	175.3		2.3	
								5.1		618.4		2.0	

<sup>1</sup> Grand mean is 874.07 meters<sup>2</sup> Grand mean is 52.77 m<sup>3</sup><sup>3</sup> Grand mean is 7.41 persons<sup>4</sup> Grand mean is 5.24<sup>5</sup> Grand mean is \$1307.5<sup>6</sup> Grand mean is 1.60

Distance from the Holy Mosque  
by Nationality

The test results show significant differences among nationalities with respect to the location of the accommodation as related to the Holy Mosque. The results support my hypothesis of significant differences existing between the above two variables.

By looking at the average distance, 874.07 metres, of each nationality we find the following:

Above the Average Distance.--These respondents are pilgrims from Saudi Arabia, Iran, Nigeria, Yemen, Iraq, and Egypt, respectively.

These locations attract those pilgrims either because of their low rent, because of their quality, or both rent and quality.

Pilgrims from IRAN are specifically advised by their health mission to live as far as possible from the center of the city.

Below the Average.--These respondents are pilgrims from Algeria, Libya, Malaysia, Syria, India, Sudan, Morocco, Pakistan, Indonesia, Somalia, United Arab :

Emirates, Turkey, and Other Nationalities.<sup>1</sup> Those pilgrims from different nationalities live within a closer distance to the Holy Mosque.

#### Accommodation Size by Nationality

The test results show significant differences among pilgrims from different nationalities with respect to number of persons per accommodation. The test results support my hypothesis of significant differences between the above variables (see Figure 13).

By looking at the average size of accommodation, 52.77 m<sup>3</sup>, we find the following:

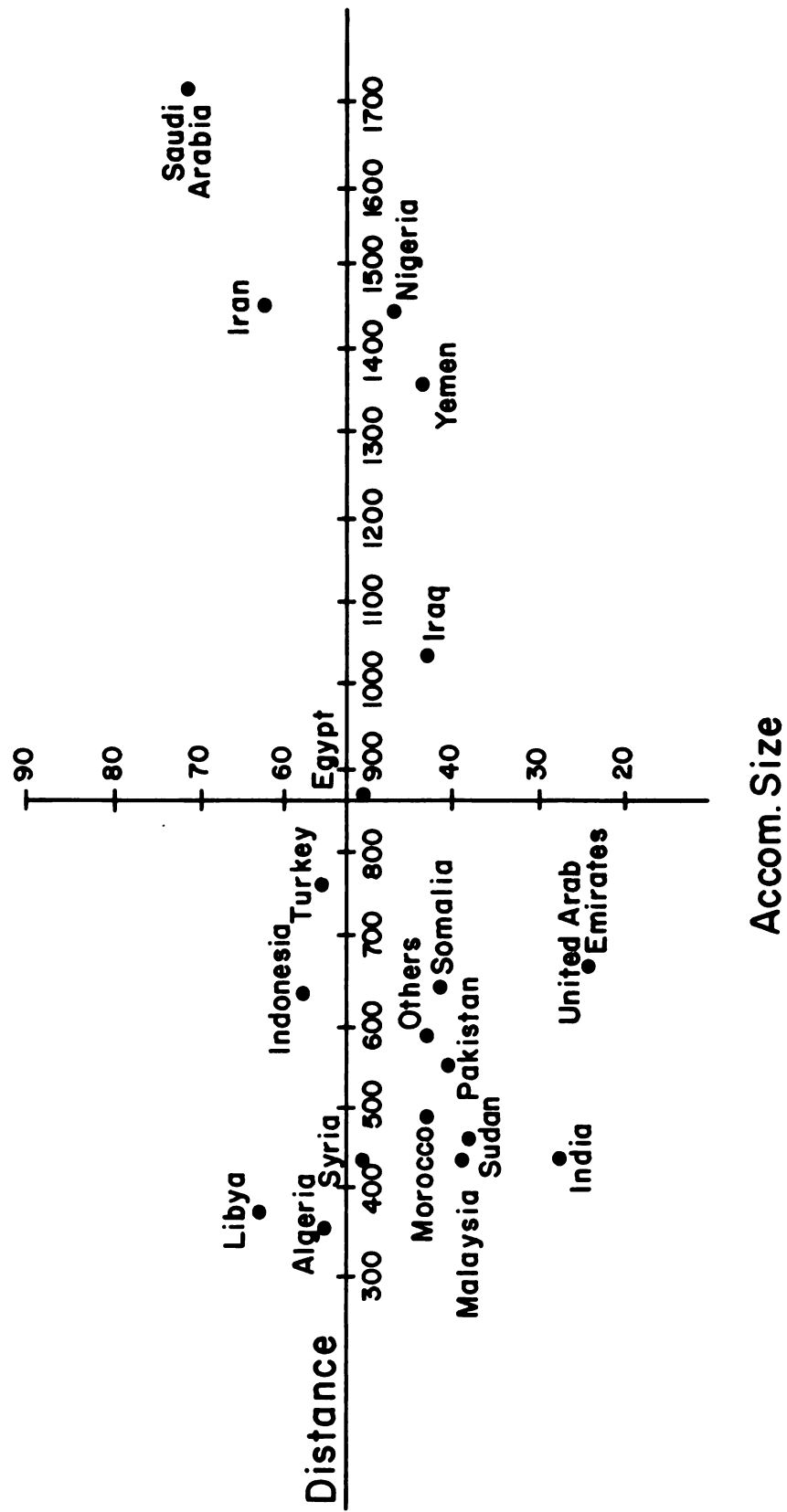
Above Average.--These respondents represent accommodations of pilgrims from Saudi Arabia, Iran, Libya, Indonesia, Turkey, and Algeria, respectively. Although there is no relationship between distance and size of accommodation, as discussed in the previous chapter, we find that the pilgrims from Saudi Arabia and Iran who live at

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<sup>1</sup>All references to "Other Nationalities" indicate the eleven nationalities represented by one respondent only.



FIG. 13  
 DISTRIBUTION OF MEAN FOR INDEPENDENT VARIABLES  
 AND NATIONALITY



greater distances from the Mosque, live in larger accommodations.

Below Average.--Below average size rentals are accommodations inhabited by pilgrims from Nigeria, Iraq, and Egypt. These nationalities locate in below average size rentals even though they live at a distance from the Mosque which is above the average.

Other pilgrims with below average size accommodations are United Arab Emirates, India, Sudan, Malaysia, Pakistan, Morocco, Somalia, Yemen, and Syria, and Others, who live closer to the Mosque.

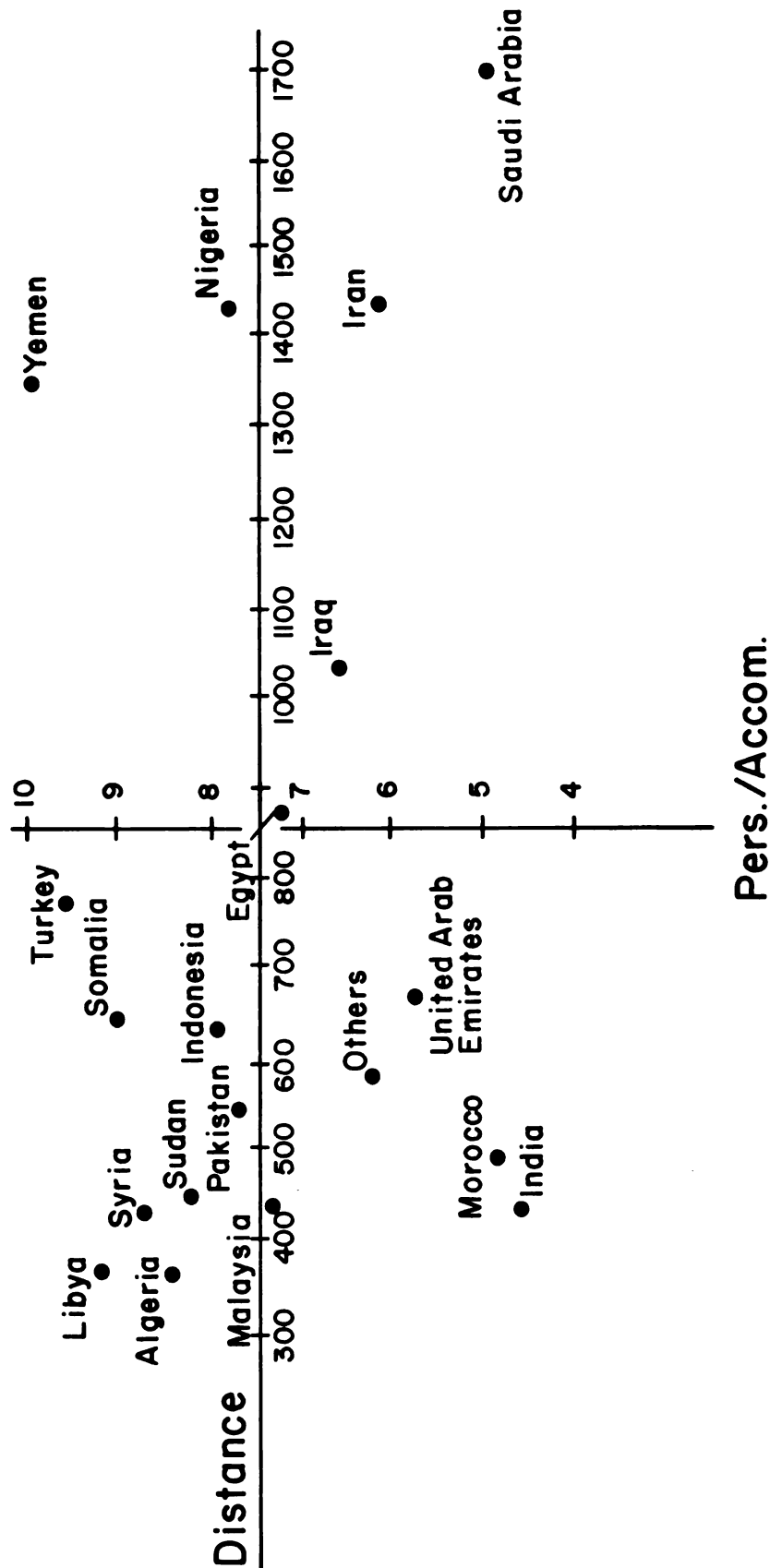
#### Number of Persons by Nationality

The test results do not show any significant differences among nationalities with respect to number of persons per accommodation. The test results support my hypothesis of no significant differences (see Figure 14).

By looking at the average number of persons, 7.41, in an accommodation, we find the following:

FIG. 14

# DISTRIBUTION OF MEAN FOR INDEPENDENT VARIABLES AND NATIONALITY



Above Average.--Accommodations which have more than 7.4 persons in each unit are occupied by pilgrims from Yemen and Nigeria, who live at greater distances from the Holy Mosque and have below average size accommodations. Also in this category are pilgrims from Turkey, Libya, Algeria, and Indonesia who all have above average size accommodations. Pilgrims from Somalia, Syria, Sudan, and Pakistan have an above average number of persons per accommodation, but below average size accommodations.

Below Average.--Accommodations having below average number of pilgrims are occupied by pilgrims from India, Malaysia, Morocco, Saudi Arabia, United Arab Emirates, Others, Iran, Iraq, and Egypt. Of these, only pilgrims from Saudi Arabia and Iran have above average size accommodations.

#### Quality by Nationality

The test results show significant differences among pilgrims from different nationalities with respect to quality of accommodation. The results support my hypothesis

of significant differences existing between the above two variables (see Figure 15).

By looking at the average quality of the accommodations, 5.24, occupied by different nationalities, we find the following:

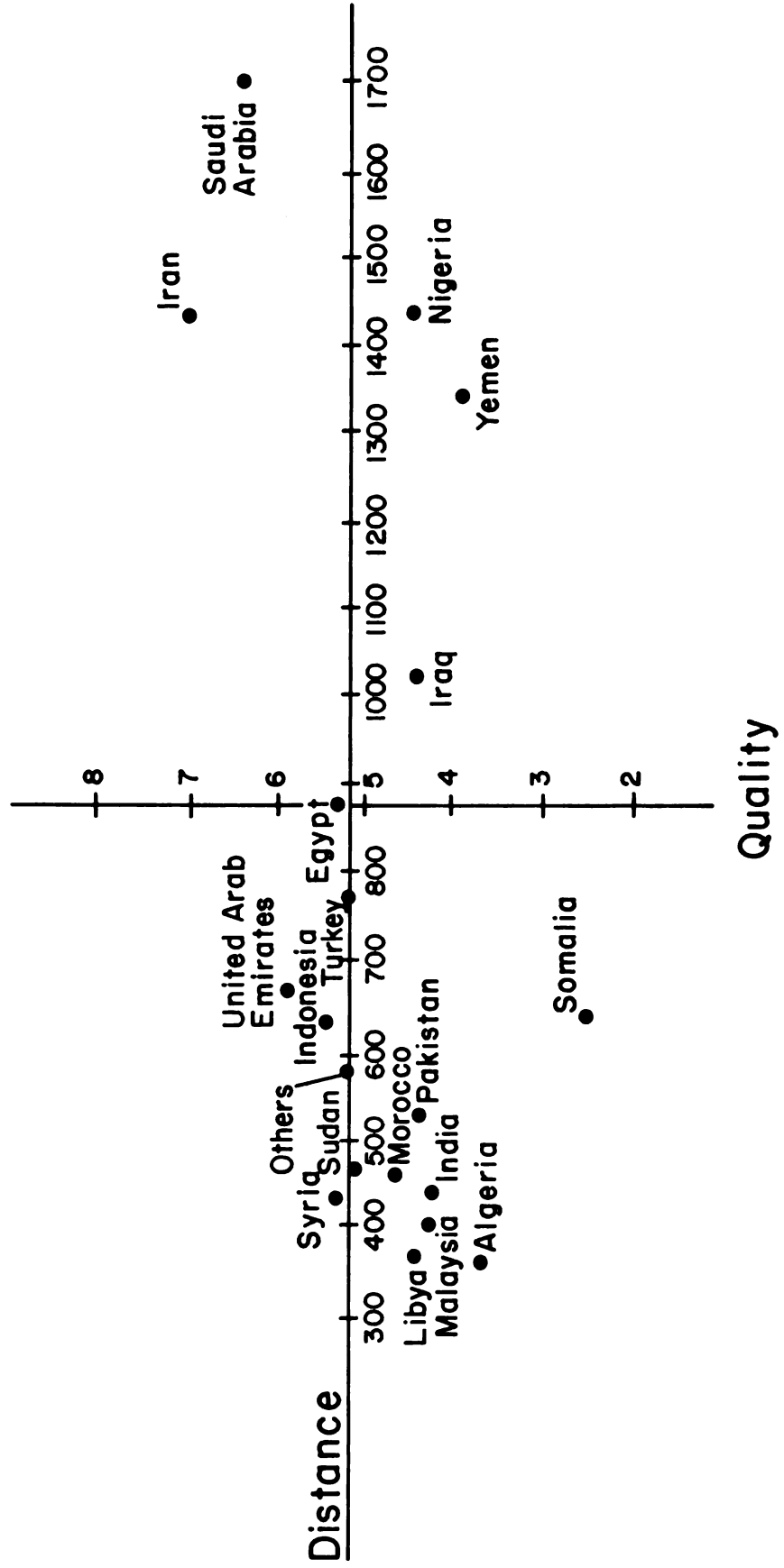
Above Average.--Above average quality accommodations are occupied by pilgrims from Iran and Saudi Arabia. Both groups have low average number of persons per unit, and above average size of accommodation, and reside away from the city center.

These factors indicate that distance from the city center, number of persons per accommodation, the size of the accommodation, in addition to the nature of the pilgrims themselves have a great effect on the quality of the accommodation.

Below Average.--Below average quality accommodations are those which are occupied by pilgrims from Somalia, Sudan, Malaysia, and Pakistan. These nationalities also locate close to the city center, have below average size accommodations and they live with an above average number of persons. Pilgrims from Libya and Algeria have

FIG. 15

# DISTRIBUTION OF MEAN FOR INDEPENDENT VARIABLES AND NATIONALITY



low quality accommodations, because they are living in small, crowded accommodations within a shorter distance from the Holy Mosque just as pilgrims from Yemen and Nigeria have low quality accommodations since they also are living in small, crowded accommodations but at greater distance from the Holy Mosque. Pilgrims from India and Morocco have below average quality accommodations as they are residing in small size accommodations within the city center while others, such as pilgrims, from Iraq and Egypt, have low quality simply because they live in small size accommodations.

#### Rent Cost by Nationality

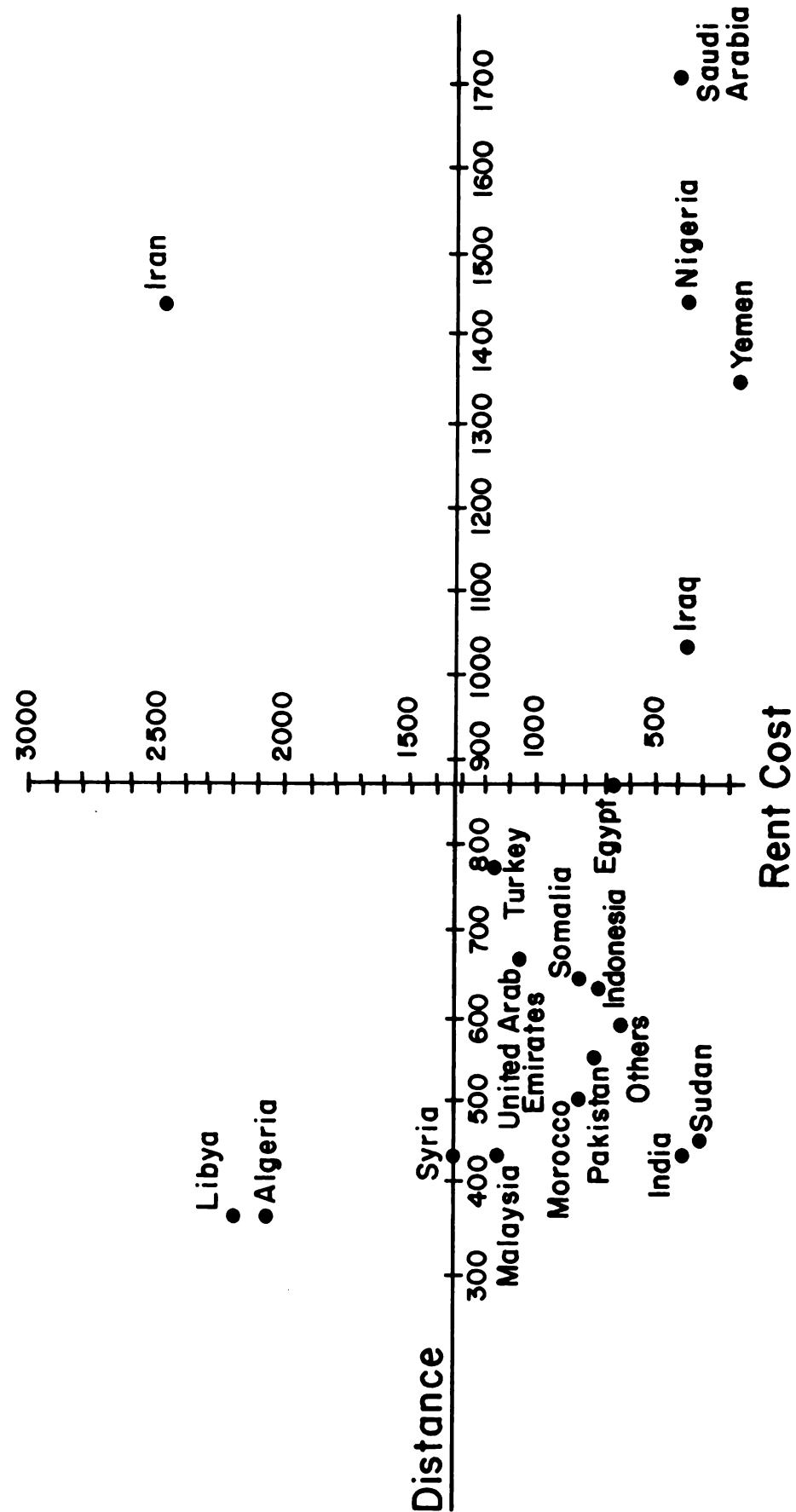
The test results show significant differences among pilgrims from different nationalities with respect to rent cost per accommodation.

The results support my hypothesis, which is that there are significant differences between the above variables (see Figure 16).

By looking at the average rent cost per accommodation, \$1307.5, in each nationality we find the following:

FIG. 16

# DISTRIBUTION OF MEAN FOR INDEPENDENT VARIABLES AND NATIONALITY





Above Average.--Above average rent cost of accommodations is paid by pilgrims from Iran, Libya, and Algeria.

Pilgrims from Iran pay higher rent prices and, accordingly, they get higher quality accommodations. They live in above average size, uncrowded accommodations with all the facilities available included.

Pilgrims from Libya and Algeria pay high rent prices but they get below average quality accommodations without adequate facilities.

The above conditions could be related to their locations from the Holy Mosque on one hand, and on the other hand they could be related to factors such as a lack of advice on where to live. For example, in the case of the pilgrims from Iran, all the accommodations to be occupied must first be examined by the Persian Health Mission to decide whether or not they are good for residence. In general, the Persian Health Mission advises their pilgrims to live in accommodations at a greater distance from the city center.

The above provisions are not made for nationalities, including Libyans and Algerians in the high rent category.

Below Average.--Below average rent costs are paid by pilgrims from Saudi Arabia, Egypt, Indonesia, and Syria. Those nationalities have, however, above average quality accommodations. This quality could be related to the distance from the Holy Mosque or to the size and facilities available in the accommodations.

The following nationalities have below average rent costs: Yemen, Sudan, Iraq, Nigeria, India, Pakistan, Morocco, Somalia, United Arab Emirates, Malaysia, and Turkey.

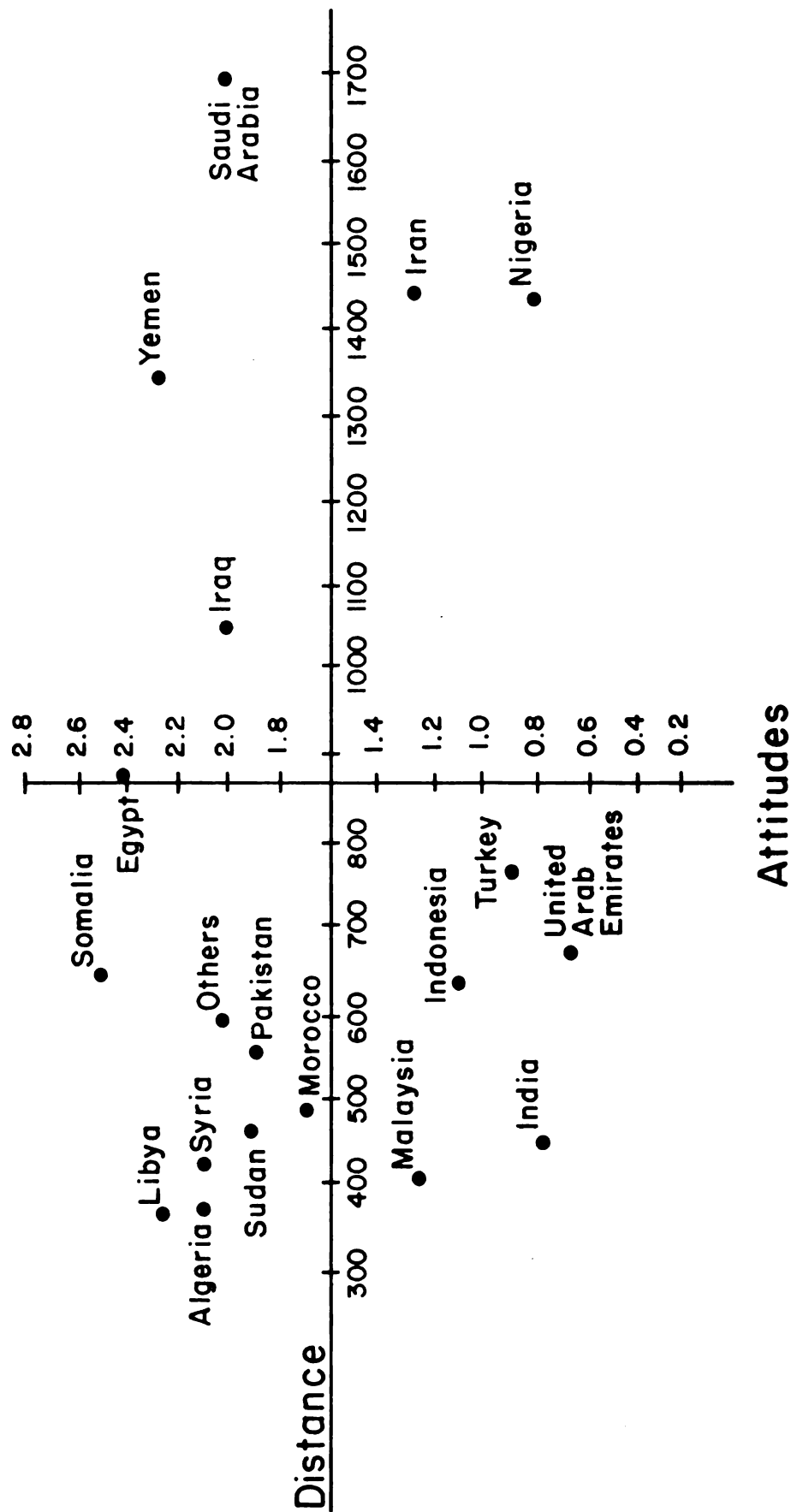
#### General Attitudes by Nationalities

The test results show significant differences among pilgrims from different nations with respect to pilgrims' attitudes. The results support my hypothesis, which is that there is a significant difference between the above variables (see Figure 17).

By looking at the average total complaints, 1.60, of the pilgrims from different nationalities we find the following:

FIG. 17

# DISTRIBUTION OF MEAN FOR INDEPENDENT VARIABLES AND NATIONALITY



Above Average.--Above average total complaints are represented by Somalia, Egypt, Libya, Yemen, Syria, Algeria, Iraq, Saudi Arabia, Sudan, Pakistan, and Morocco respectively.

Pilgrims such as Libyan and Algerians who have low quality accommodations and live in congested areas while they still pay high rent prices, are different than those from Saudi Arabia and Egypt who pay low rent prices and get above average quality and a below average number of persons per unit. Libyan and Algerian pilgrims pay high for their locations close to the Mosque.

Below Average.--Below average total complaints are made by pilgrims from United Arab Emirates, India, Nigeria, Turkey, Indonesia, Malaysia, and Iran.

As we notice, most of these pilgrims do not speak Arabic, which is one of the problems faced in this study. This does not, however, mean we were unable to get a clear idea of their attitudes.

From the data already discussed, we could predict the attitudes of the pilgrims without asking them. For instance, one could predict that the pilgrims from Iran

would have a low average of complaints, while pilgrims from Libya and Algeria would complain the most.

### Type of Attitudes by Nationality

In this section we discuss the attitudes of the pilgrims toward congestion, high cost of living, rent cost, the new system of dividing the pilgrims, lack of water, as well as various other complaints that the pilgrims mentioned in interviews (as summarized under the category of "Other Complaints"). These data are compiled and presented in Tables 10 and 11 and Figure 18.

TABLE 10. NATIONALITY BY PILGRIMS ATTITUDES:  
CHI SQUARE TEST RESULTS

Test	Con- ges- tion	Cost of Living	Rent Cost	New System of Dividing Pilgrims	Lack of Water	Others
$\chi^2$	32.51	26.04	49.68	33.84	33.36	32.79
Degrees of Freedom	26	26	28	26	26	26
Sig.	.1769	.4611	.0070 <sup>a</sup>	.1392	.1518	.1682
n	171	171	221	171	171	171

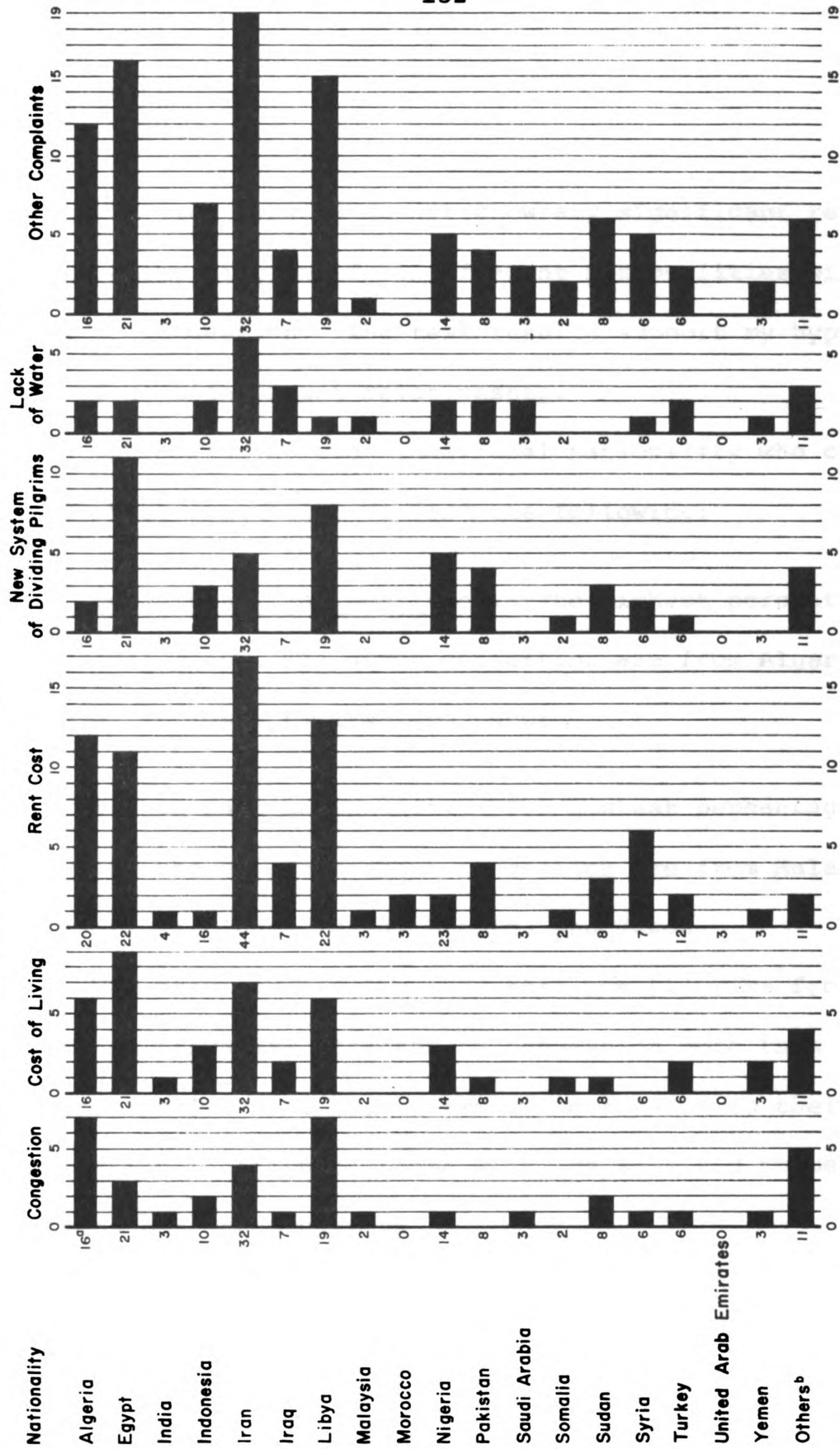
<sup>a</sup>Significant at .01 level.

TABLE 11. PERCENTAGE OF COMPLAINTS BY PILGRIMS' NATIONAL ORIGIN

	CONGESTION			COST OF LIVING			RENT COST			NEW SYSTEM OF DIVIDING THE PILGRIMS			LACK OF WATER			OTHER COMPLAINTS						
	Re-spon-dents	Com-plaints	% of Respon-dents N	Re-spon-dents	Com-plaints	% of Respon-dents N	Re-spon-dents	Com-plaints	% of Respon-dents N	Re-spon-dents	Com-plaints	% of Respon-dents N	Re-spon-dents	Com-plaints	% of Respon-dents N	Re-spon-dents	Com-plaints	% of Respon-dents N				
Nationality	Algeria	16	7	43.8	4.1	16	6	37.5	3.5	20	12	60	5.4	16	2	12.5	1.2	16	12	75	7.0	
	Egypt	21	3	14.3	1.8	21	9	42.9	5.3	22	11	50	5.0	21	11	52.4	6.4	21	16	76.2	9.4	
	India	3	1	33.3	.6	3	1	33.3	.6	4	1	25	.5	3	0	0	0	3	0	0	0	
	Indonesia	10	2	20	1.2	10	3	30	1.8	16	1	6.3	.5	10	3	30	1.8	10	7	70	4.1	
	Iran	32	4	12.5	2.3	32	7	21.9	4.1	44	17	38.6	7.7	32	5	15.6	2.9	32	19	59.4	11.1	
	Iraq	7	1	14.3	.6	7	2	28.6	1.2	7	4	57.1	1.8	7	0	0	0	7	3	42.8	1.8	
	Libya	19	7	36.8	4.1	19	6	31.6	3.5	22	13	59.1	5.9	19	8	42.1	4.7	19	15	78.9	8.8	
	Malaysia	2	1	50	.6	2	0	0	0	3	1	33.3	.5	2	0	0	0	2	1	50	.6	
	Morocco																					
	Nigeria	14	1	7.1	.6	14	3	21.4	1.8	23	2	8.7	.9	14	5	35.7	2.9	14	5	4.5	2.9	
	Pakistan	8	0	0	0	8	1	12.5	.6	8	4	50	1.8	8	4	50	2.3	8	4	50	2.3	
	Saudi Arabia	3	1	33.3	.6	3	0	0	0	3	0	0	0	3	0	0	0	3	3	100	2.7	
	Somalia	2	0	0	1.2	2	1	50	.6	2	1	50	.5	2	1	50	.6	2	2	100	1.8	
	Sudan	8	2	25	.6	8	1	12.5	.6	8	3	37.5	1.4	8	3	37.5	1.8	8	6	75	3.5	
	Syria	6	1	16.7	.6	6	0	0	0	7	6	85.7	2.7	6	2	33.3	1.2	6	5	83.3	2.9	
	Turkey	6	1	16.7	.6	6	2	2	1.2	12	2	16.7	.9	6	1	16.7	0	6	3	50	1.8	
	United Arab Emirates																					
	Yemen *	3	1	33.3	0	3	2	2	1.2	3	1	33.3	.5	3	0	0	0	3	1	33.3	6	
	Others *	11	5	45.5	2.9	11	4	36.4	2.3	11	2	18.2	.9	11	4	36.4	2.3	11	3	27.3	1.8	

\*Includes eleven nationalities with one response each.

FIG. 18 NUMBER OF COMPLAINTS BY PILGRIMS' NATIONAL ORIGIN

<sup>a</sup>Number of respondents<sup>b</sup>Includes eleven nationalities with one response each

Congestion by  
National Origin

The test results do not show any significant relationship among pilgrims from different nationalities with respect to congestion. The test results support my hypothesis of no significant relationship.

By looking at each individual nationality who complained about congestion we find the following:

Between All Nationalities.--The highest percentage of pilgrims' complaints about congestion are from Algeria and Libya, followed by Iran and Egypt.

Within Each Nationality.--The highest percentage of pilgrims who complain about congestion are from Malaysia, Algeria, Libya, India, Saudi Arabia, and Yemen.

The previous results show that the pilgrims from Algeria and Libya are affected by congestion more than any other pilgrims, a fact that seems to be related to their accommodation location combined with the size and number of persons per accommodation.



Cost of Living by  
National Origin

The test results do not show any significant relationship among pilgrims from different nationalities with respect to cost of living.

The results lead to a rejection of the hypothesis that there is a significant relationship.

By looking at each individual nationality who complained about cost-of-living, we find the following:

Between All Nationalities.--The pilgrim nationality which complained most about cost of living was Yemen, followed by Egypt, Algeria, India, Turkey, Libya, and Indonesia, in that order.

It bears mentioning that some pilgrims, such as those from Egypt and Indonesia, bring foods from their own countries for their own use and for sale. Other pilgrims, such as those from Iran and Afghanistan bring and sell rugs, while others use the pilgrimage as a commercial business by buying things that cost more in their own countries in order to resell them at home.

In fact, the high cost of living is not only a problem for pilgrims, it is a major problem for the

residents of Mecca, themselves, especially those who do not deal with the pilgrims and who have a limited income.

#### Rent Cost by National Origin

The test results show a significant relationship among pilgrims from different nationalities with respect to rent cost per accommodation.

The test results support my hypothesis of the existing relationship between the above two variables. By looking at each individual nationality who complained about rent cost, we find the following:

Between All Nationalities.--The pilgrim nationality which complained most about rent cost was Iran followed by Libya, Algeria, and Egypt.

As we discussed in the previous sections, the pilgrims from Iran pay the highest rent cost, but in return they get the highest quality, the largest size, and the least number of persons per accommodation. Pilgrims from Algeria and Libya pay higher rent but they get lower quality; while pilgrims from Egypt pay lower rent and get higher quality with the least number of persons per accommodation.

Within Each Nationality.--The highest percentage among the pilgrims who complain about rent cost were those from Syria, followed by Morocco, Algeria, Libya, Iraq, and Egypt, respectively. All the foregoing nationalities, except Algeria and Libya, pay below average rent cost, in fact.

New System of Dividing the  
Pilgrims by National Origin

The test results do not show any significant relationship among pilgrims from different nationalities with respect to the new system of dividing the pilgrims. The hypothesis is rejected, that there is a significant relationship.

By looking at each individual nationality which complained about the above system we find the following:

Between All Nationalities.--The highest percentage among the pilgrims who complained about the new system of dividing the pilgrims are those from Egypt, followed by Libya, Iran, Nigeria, and Pakistan, respectively.

Within Each Nationality.--The highest percentage among the pilgrims who complained about the new system are those from Egypt followed by Pakistan and Libya.

As discussed in the previous chapters, the purpose of this system is to stop the process of purchasing pilgrims by agents so the pilgrims will get the best services possible. The December 1975 pilgrimage was the first attempt at applying this system.

Lack of Water by  
National Origin

The test results show no significant relationship among pilgrims from different nationalities with respect to lack of water. The test results support my hypothesis of no significant relationship. By looking at each individual nationality who complained about the lack of water, we find the following:

Between All Nationalities.--The highest percentage among the pilgrims who complain about lack of water are those from Iran followed by Iraq, Algeria, Egypt, Indonesia, Nigeria, Pakistan, Saudi Arabia, and Turkey.

Within Each Nationality.--The highest percentage among the pilgrims who complained about lack of water are those from Iraq followed by Saudi Arabia, Turkey, and Pakistan.

In spite of the fact that the results show no significant relationship between the above variables, water continues to be a critical problem in Mecca.

Other Complaints by  
National Origin

The test results show no significant relationship among pilgrims from different nationalities with respect to other complaints. The test results support my hypothesis of no significant relationship existing between the above variables. By looking at each individual nationality who made other complaints, we find the following:

Between All Nationalities.--The highest percentage among the pilgrims having other complaints are those from Iran followed by Egypt, Libya, and Algeria.

Within Each Nationality.--The highest percentage among the pilgrims with other complaints are those from

Saudi Arabia and Somalia, followed by pilgrims from Syria, Libya, and Egypt.

### Type of Rentals by Nationality

Every pilgrim that comes to Mecca must register with one of the pilgrim agents in Mecca, except those from Yemen, Oman, United Arab Emirates, and Kuwait. The registration provides all the services that the pilgrims need when they arrive in Mecca until their departure. Also, the pilgrims who come with their leaders must be registered with the agents from Mecca.

Not all the pilgrims live in the agents' accommodations; some of them prefer to choose their own accommodations by themselves, either from the owner of the accommodation or from the occupant by subleasing it, but they still belong to a particular agent. Other pilgrims live with friends or relatives (see Table 12). Not all the pilgrim agents own their accommodations but some sublease from the occupants and others rent them from the owners.

Most of the owners either occupy their accommodations through the rest of the year and move out temporarily

TABLE 12. TYPE OF RENTALS BY PILGRIM NATIONALITY

Nationality	n	OCCUPIERS		PILGRIM AGENTS		PILGRIM LEADERS		OWNERS	
		Re-spondents	% of Re-spondents	Re-spondents	% of Re-spondents	Re-spondents	% of Re-spondents	Re-spondents	% of Re-spondents
Algeria	19	1	5.3	16	84.2	0	0	2	10.5
Egypt	21	3	14.3	14	66.7	0	0	4	19.0
United Arab Emirates	3	0	0	0	0	0	0	3	100
India	3	0	0	2	66.7	0	0	1	33.3
Indonesia	16	0	0	13	81.3	1	6.3	2	12.5
Iran	42	0	0	4	9.5	33	78.6	5	11.9
Iraq	5	0	0	1	20	4	80	0	0
Libya	20	0	0	19	95	0	0	1	5
Morocco	3	1	33.3	2	66.7	0	0	0	0
Malaysia	3	0	0	3	100	0	0	0	0
Nigeria	20	2	10	8	40	1	5.0	9	45
Pakistan	8	0	0	4	50	0	0	4	50
Saudi Arabia	3	0	0	0	0	1	33.3	2	66.7
Somalia	2	0	0	2	100	0	0	0	0
Sudan	8	1	12.5	1	12.5	0	0	6	75
Syria	6	1	16.7	2	33.3	0	0	3	50
Turkey	11	1	9.1	4	36.4	2	18.2	4	36.4
Yemen	3	0	0	0	0	0	0	3	100
Others*	10	3	30	3	30	2	10	2	20
TOTAL	206	13	6.3	98	43.2	44	21.4	51	24.8

\*Includes eleven nationalities that had only one response each.

in the pilgrimage period, or live in part of the house and rent the rest to the pilgrims. The pilgrim leaders rent the accommodations that they provide to pilgrims either from the owners or the occupants directly.

The distribution of the various nationalities according to type of rental is as follows:

Pilgrim Leaders.--The highest percentage of the total pilgrims living with the pilgrim leaders are from Iran followed by pilgrims from Iraq, Turkey and Others.

If we look at each nationality we find that 80% of the pilgrims from Iraq are living with the pilgrim leaders, followed by pilgrims from Iran and Saudi Arabia.

Pilgrim Agents.--The highest percentage of the total pilgrims living with the pilgrim agents is from Libya followed by Algeria, Egypt, and Indonesia.

If we look at each nationality, we find that 100% of the pilgrims from Malaysia and Somalia are living with the pilgrim agents, followed by pilgrims from Libya, Algeria, and Indonesia.



Accommodations' Owners.--The highest percentage of the total pilgrims living with the owners of the accommodations are from Nigeria, followed by pilgrims from the Sudan, Iran, Egypt, Pakistan and Turkey, while if we look at each nationality we find that 100% of the pilgrims from Yemen and United Arab Emirates live with accommodations belonging to the owners, followed by pilgrims from Sudan, Saudi Arabia, and Syria.

Accommodations' Occupants.--The highest percentages of the total pilgrims living in or subleasing their accommodations from the occupants are pilgrims from Egypt and Others, followed by pilgrims from Nigeria. If we look at each nationality, we find that 33.3% of the pilgrims from Morocco are living or subleasing their accommodations from the occupant, followed by pilgrims from Others, Syria, and Egypt.

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

Based on this analysis of the problems of pilgrim housing in Mecca, a number of recommendations seem to be warranted.

In order to achieve the objective of improving the pilgrimage system, the following remarks are presented in the form of a number of specific recommendations, designed to provide alternatives and suggest priorities leading to better-organized and safer pilgrimages.

From the last two chapters, it is clear that rent per accommodation is influenced to some degree by all variables considered: distance, quality, accommodation size, and accessibility to the Holy Mosque.

The quality of the accommodation increases slightly as one moves away from the city center, then increases rapidly as one reaches the outskirts. Although the density of the pilgrims decreases with increasing distance from the center of the city, the size of the accommodations remains about the same.

Looking at the above results, one should acknowledge that the center of the city where the Holy Mosque is located has the lowest quality and the highest density, yet it has the highest rent cost per accommodation.

The test results show that the pilgrims residing with pilgrim leaders are located at a further distance from the Holy Mosque and pay higher rent cost for higher quality accommodations. The pilgrims residing with pilgrim agents live shorter distances from the Holy Mosque, have the lowest quality housing, and pay higher rent costs.

It is clear that by encouraging the pilgrims to live away from the city center, they will be helped in getting good quality accommodations and reasonable rent costs. This could be possible if the government started building apartment buildings in different parts of Mecca and rented them to the pilgrims either directly <sup>or</sup> ~~re~~ indirectly.

The test results do not show any significant relationship between congestion, cost of living, rent cost or other complaints with respect to the four types of rentals. In the case of congestion, we find that the pilgrims who complain the most are those who are residing within shorter

distances from the Holy Mosque. In the case of cost of living, the pilgrims who complain the least are those who live at a greater distance from the Holy Mosque. Pilgrims who complain about rent cost are those who live with pilgrim agents who reside close to the Holy Mosque, and those who live with pilgrim leaders at further distances from the Holy Mosque, while those pilgrims who live in between, with the owners and the occupants, have fewer complaints.

It is recommended that pilgrims be encouraged to live away from the city center to lessen the pressures that now face the center.

The greatest complaint about the new system is found with the pilgrims who reside with owners and the occupants. It is true that this system is new and we should expect complaints about it, but also this system should be flexible, in that families or close friends should not be assigned arbitrarily to different agents.

Water is a problem not only in Mecca but also in most cities in Saudi Arabia. With all the existing resources of water in Mecca, the city still faces a critical problem of lack of water. The problem would be less if additional sources were brought to the city. Mecca could

be supplied additional water by the refinery at the Red Sea, or this resource could be diverted to Jiddah and Jiddah's present source of water (Wadi Fatima) could be shifted to Mecca.

Accommodations in Mecca are not only a problem during the pilgrimage period, but also a serious problem that the residents face all the year around. In this paper I am not dealing with a solution to the problem; instead I am trying to understand the problem and hoping the Authority will reach a solution.

The problem of accommodations can be summarized as follows:

With the booming growth of Saudi Arabian income, most Saudi-Arabian cities--especially Mecca--are still in a period of disaster in residential areas in terms of supply. This is demonstrated by recent projects to clear housing in different parts of the city. It is true that the government pays the residents for their appropriated houses, but by taking into consideration the country-wide inflation and the high prices of land and building materials, we find that none of the residents can build accommodations equal in quality to the ones they built twenty

years ago. It is more logical that the sponsors should build new houses in new planning areas and give them to the residents who were moved from their own old locations before their homes were destroyed. And if there was some money left to the credit of the residents the government should pay them promptly in cash or, in a reverse situation, the residents should pay the government over a mutually satisfactory period.

Within the city there are a large number of vacant land areas. These sites would help solve the accommodation problem if the owners and/or the government would build apartment buildings on them.

The government should beat with a hand of iron those owners who close their houses all the year and rent them only during the pilgrimage time, since they make up the difference by charging the pilgrims more during the pilgrimage period. Also the government should punish severely those brokers who rent the houses ahead of the pilgrimage period and rent them to the pilgrims during the pilgrimage at double or quadruple rates.

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Jeddah

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APPENDIX  
QUESTIONNAIRE

HAJJ RESEARCH CENTRE, KING ABD AL AZIZ UNIVERSITY, JEDDAH, SAUDI ARABIA		مركز الحج للبحوث جامعة الملك عبد العزيز جدة المملكة العربية السعودية	
PILGRIM ACCOMMODATION SURVEY SPECIAL STUDY: Ghazy Makky 14(1)1395.		حالة مسكن الحجاج دارسة خاصة : غازي عبد الواحد مكى	
Name and Number of Survey Team 01		إسم الباحث ورقمه	
House Reference Number (see map) 02		رقم المنزل (أنظر الخارطة)	
Floor level of Accommodation Surveyed 03		رقم الطابق	
Location of Accommodation 04		موقع المسكن	
Kind of Accommodation 05		نوع المسكن	
Hotel 1	House 2	Flat 3	Villa 4
فندق	منزل	شقة	فلا
Shant/Tent خيمة		منطقة	
SELECT PILGRIM OCCUPANT : إختيار الحجاج المسكن			
What kind of facilities does the accommodation utilise 06			
Bathroom الحمام	Bath مغطس/باينو	Shower دوش	WHB مغسلة أيدي
Kitchen المطبخ	Sink حوض	Cooker جهاز طبخ	Fridge ثلاجة
Services خدمات	Electricity كهرباء	Piped H <sub>2</sub> O ماء جارى	Drainage شبكة مجرى
External Facilities خدمات إضافية	Hotel Serv. خدمات فندقية	Cleaner عامل نظافة	Cook طباخ
Size of Selected Room 07	Length الطول	Width العرض	Height الارتفاع
Ambiance 08	Daylight إضاءة النهار	Ventilation التهوية	Noise الضوضاء
	Good جيدة	Good جيدة	Clean نظيفة
	Bad رديئة	Bad رديئة	Dirty رديئة
Number of Persons sharing selected room/tent 09			
For how long has the room been rented. 10			
What is the price of the room for the period rented 11			
If item 11 is not applicable, what is the price per person for the specified period. 12			
From whom did you rent this room 13			
Occupier. 1	Pilgrim Agent 2	Pilg. Leader 3	Owner 4
مقيم	موقوف	مجلس	المالك
Are you satisfied with the standard of accommodation 14			
If not, why 15			
Are you satisfied with the rent as value for money 16			
If not, what do you consider to be a satisfactory rent as good value. 17			
PLEASE TURNOVER TO SIDE 2 ***** أقلب الورقة من فضلك			

PILGRIM ACCOMMODATION SURVEY SPECIAL STUDY 14(2)1395				استمارات عن مساكن الحجاج دراسة خاصة: غازي عبدالواحد مكي			
What are the Nationalities sharing this room 18 ما هي الجنسيات التي تشارك في سكن هذه الغرفة				1	No.		
				2	No.		
				3	No.		
				4	No.		
				5	No.		
What are the predominant Nationalities in the neighbourhood 19 ما هي الجنسية الغالبة في المنطقة				1			
معلومات يجب على الباحث تقديم لنفسه				2			
				3			
				4			
Could the Survey Team classify the general environment of the house 20				Date:	اليوم		
				Time:	الوقت		
Noise Level	1. High	2. Tolerable	3. Quiet.				
مستوى الإزعاج	مرتفع	مزعج	هادئ				
Refuse Accumulation in street	1. Dirty	2. Untidy	3. Clean				
نظافة الشارع	وسخ	غير منظم	نظيف				
Crowds in streets	1. Heavy	2. Medium	3. Low				
مستوى ازدحام الشارع	ثديفة	متوسطة	منخفضة				
Has the Pilgrim any general comments he would like to make concerning the conditions of the Hajj as a whole? Please insert below:- هل لدى الحجاج ملاحظات عن حالة الحج؟ أكتب ذلك في الفراغ التالي							

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