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THE SPATIAL PATTERN OF FARM SIZES IN THE PANJAB[1] REGION OF WEST PAKISTAN

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FARMING is a cultural process and implies a kind of functional relationship between man and the land. This relationship reflects a system of rural occupance and creates observable imprints in the form of farms which function as units of production as well as consumption.[2] These farms are of different sizes and constitute an important feature of the agrarian landscape. Such variations in farm sizes are of direct interest to geographers. Studies of farm sizes, however, have received but little attention and generally only a secondary reference has been afforded them in geographical literature[3]. This is despite the fact that agricultural geography is one of the earliest fields cultivated by geographers[4]. Thus there is a need that the studies in farm size be furthered particularly with reference to developing agrarian nations, which are engaged in agricultural planning and reforms.

For the purpose of present inquiry the case of the Panjab region has been selected. There exists wide variations in the size of farms ranging from small uneconomical ones to large estates. In view of such inequalities in farm sizes the question which size of farm dominates where ? becomes the main theme along which this study has been organized.

The purposes of this inquiry may be stated as: 1) to examine the distsibution pattern of the various categories of farm sizes in the Panjab region, and 2) to attempt a spatial generalization of the farm sizes. It is hoped that the study will provide answers to some of the basic questions related to the distribution

[1]The Panjab region is defined here as that part of the province of West Pakistan where Panjabi culture is dominant. It includes the divisions of Rawalpindi, Sargodha, Lahore, Multan (excluding Baluch Trans Frontier Tract of Dera Ghazi Khan district) and Bahawalpur.

[2]For a comprehensive statement see P. L. Wanger, *The Human Use of the Earth* (Glencoe, Illinois : The Free Press, 1960), P. 175.

[3]Short discussions on farm size have been afforded by O. E. Baker in his studies on "Agricultural Regions of North America" *Economic Geography*, Vols. 2—9 (1926—33).

[4]H. H. McCarty, "Agricultural Geography" in P. E. James and C. F. Jones, Eds. *American Geography Inventory and Prospect* (Syracuse : Syracuse University Press, 1954). P. 259.

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of farm sizes, and would help in the construction of hypotheses for further researches on similar lines.

This study is based on the quantitative data derived from *Pakistan Census of Agriculture*, 1960. Some observations regarding the quality of data would, logically, be a useful attempt.

The Quality of Data

Pakistan Census of Agriculture, 1960 is the first report of its kind. It signifies a commendable effort indeed. But at the same time this census cannot be considered to be absolutely flawless, which the census authorities themselves do not claim.[5] They (census authorities) have objectively evaluated the census report and have indicated the possible sources of error as follows :

1) The errors existing in the Revenue records which formed the primary source of information in the case of several items of the census,
2) Errors of transcription introduced at the stage of extraction of information from Revenue records,
3) Errors of enumerations at the time of interviewing the farmers,
4) Sampling error.

The first three kinds of errors could not be avoided even if the census was based on complete counts. They cannot be estimated either. The sampling error, however, could be avoided by resorting to complete counts which would have certainly improved the quality of data. The census authorities have attempted to explain as to why it was necessary for them to resort to sampling. But no amount of argument can compensate the damage done to the quality of information gathered by sampling which involves not only so many assumptions but also a highly sophisticated methodology requiring competent personnel, which is an acute problem in the developing countries like Pakistan. Even in the advanced nations like the United States of America agricultural census is based on complete counts. Another serious defect in the data which has not been pointed out by the census authorities arises from the definition of 'farm.'. Both of these factors influencing the census results have been discussed in the following sections.

Sampling Error

Sampling error is "a measure of probable variation of the sample estimates from the true value".[6] Larger the size of this error poorer would be the quality of the sample estimate. The basic factors influencing the size of the error are :

1) representativeness of the sample, and
2) size of the sample.

[5]Government of Pakistan, *1960 Pakistan Census of Agriculture*, Vol. II, Report III, West Pakistan (Karachi : Agricultural Census Organization, Ministry of Agriculture and Works, 1964), Pp. xix—xxi.

[6]*Ibid.* P. xix.

How representative is the sample? This is a fundamental question which arises in connection with any study based on sampling technique. As Croxton and Cowden point out "the more unlike the sample units, the more difficult is the problem of selecting a representative sample".[7] So far as this question is concerned, it seems that the authorities organizing the Pakistan Census of Agriculture have been extremely careful. The census is based on the stratification of villages by 1) size of the culturable area, and 2) assessment circle. The weightage given to culturable area is statistically sound, as most of the items dealt in the census were found to be closely related with it.[8]

What is important in this context is the size of samples drawn from each of the *tahsils* in the region under sttudy which must vary with the number of villages in each *tahsil*. As would be expected the smaller unit like a *tahsil* would provide smaller size of sample than each higher level in the hierarchy of administrative units, viz. districts, divisions and the province. It is, therefore, obvious that the size of sampling error would also be relatively large on *tahsil* level, whereas on the provincial level it would be minimum.

Of the total number of villages in each *tahsil* only twenty per cent have been selected. This produces wide disparities in sample size from *tahsil* to *tahsil*, ranging from 13 in Isakhel *tahsil* of Mianwali district to 146 in Shakargarh *tahsil* of Sialkot. Thus the sampling error of the data utilized in the present study is bound to be sufficiently large. In most of the cases less than 100 samples have been drawn. (see tables 1 and 2).

TABLE 1—ESTIMATES OF SAMPLING ERROR FOR DIFFERENT SAMPLE SIZES FOR SELECTED ITEMS

Sample size	No. of Farms	Farm area	Average size of farm	Cultivated area
7380	1.23	1.69	0.97	1.62
1250	3.00	4.11	2.35	3.92
900	3.52	4.83	2.77	4.62
600	4.32	5.92	3.39	5.65
400	5.29	7.25	4.15	6.92
300	6.08	8.34	4.77	7.96
200	7.49	10.27	5.88	9.81
144	8.81	12.08	6.92	11.54
100	10.57	14.50	8.30	13.85
64	13.22	18.12	10.38	17.31

Source : *Pakistan Agricultural Census, 1960*, Vol. II, West Pakistan Report 1, Appendix B, P. 837

[7] *Ibid.* P. xx.

[8] F. E. Croxton and D. J. Cowden, *Applied General Statistics*, (London : Sir Issaac Pitman and Sons, 2nd ed., 1955). P. 28.

TABLE 2—DISTRIBUTION OF THE FREQUENCY OF TAHSILS OF THE PUNJAB REGION IN VARIOUS CLASSES OF STANDARD ERROR

Classes of standard error	Frequency
10—20	1
20—40	11
40 -60	22
60—80	16
80—100	9
00—120	8
120—140	4
140—160	1

Source : As for Table 1

Another source of error in sampling arises from the situation when there is substitution for persons not at home or not readily available, or when the interviewers have missed some cases. The amount of error in such cases is hard to estimate and the situation is often termed as dangerous. The authors of the *Pakistan Census of Agriculture* do make mention of the situation when some cases have been missed by the interviewers.

Defective Definition

A farm has been defined as "the aggregate area of land operated[9] by one person alone or with the assistance of others, without regard to location, size or title, and used wholly or partly for agricultural production. Area of land situated in different villages but under the same operational control would constitute one farm."[10] In this definition what would bother a geographer is the question of "land situated in different villages". According to this definition even those lands which are situated in other villages, *tahsils* or districts whether contiguous or not, have been included in the farm area of a person who operates them. Obviously this definition is defective and introduces bias in favour of one unit area or the other. A *tahsil* may record a higher acreage of farm than it actually possesses and vice versa.

The defects as have been pointed out do reduce the quality of data presented in the *Pakistan Census of Agriculture*. Still, the information provided by the Census is valuable and can be gainfully employed by researchers, planners and decision makers. What is important is that a critical examination of the data must be made and the quality be pointed out. In view of the growing use of sampling techniques in the collection of a variety of socio-economic data, it may be parenthetically observed that the geographers must emphasise competence in statistical methods. Or else they must stake sophistication in using the quantitative data and remain naive.

[9]Government of Pakistan, *op. cit.*, footnote 5, P. xx.

[10]"Operation of a farm means of a) planning of its utilization, and b) the implementation of such plans", Government of Pakistan, *op. cit.*, footnote 5, P. xxv.

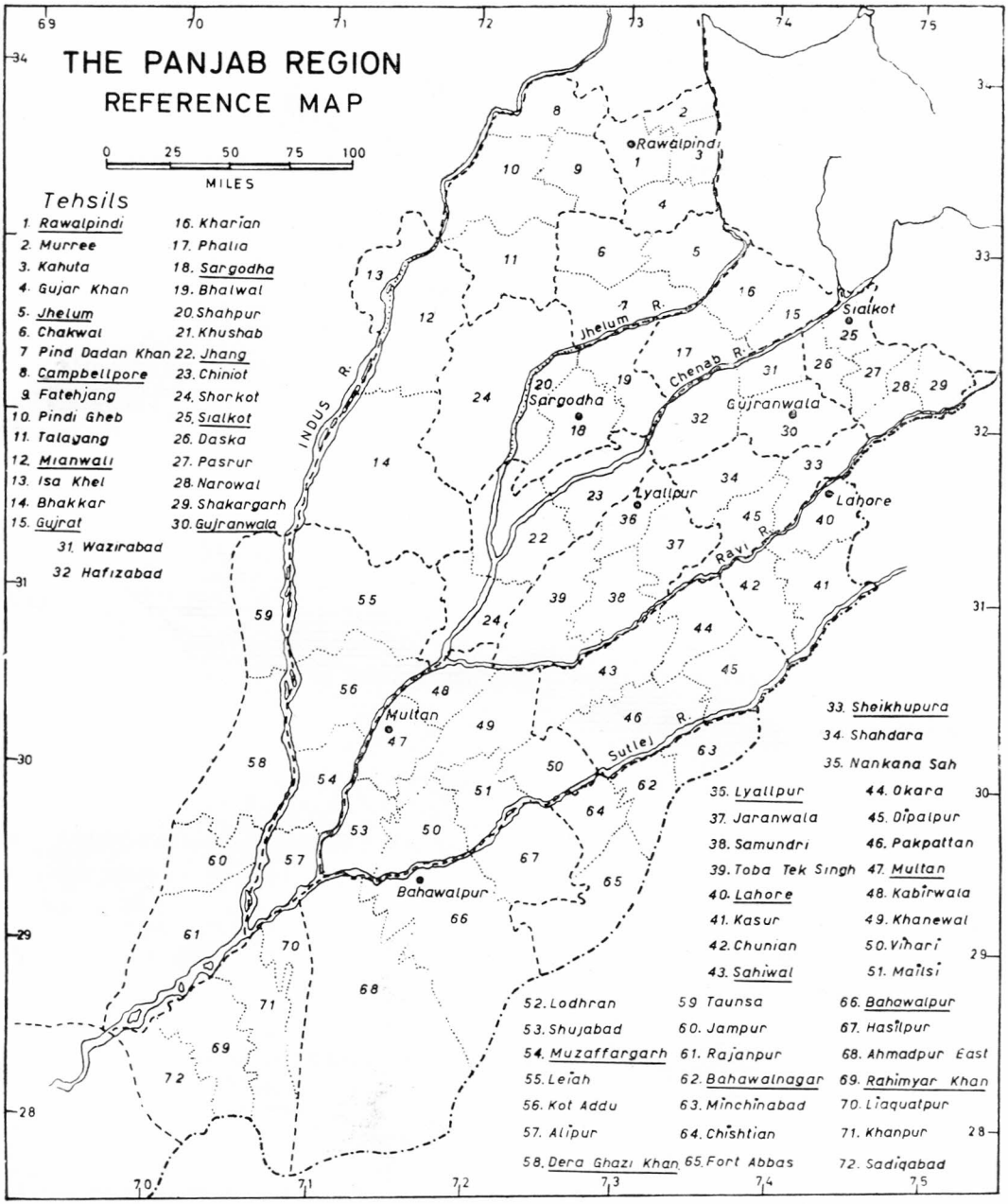

Fig. 1. This map shows the main rivers, major cities and the *tahsils* in the Panjab Region. The marginal information includes a list of the *tahsil* names corresponding to the numbers assigned to each *tahsil* in the map. The *tahsil* names, which also apply to their respective districts have been underlined.

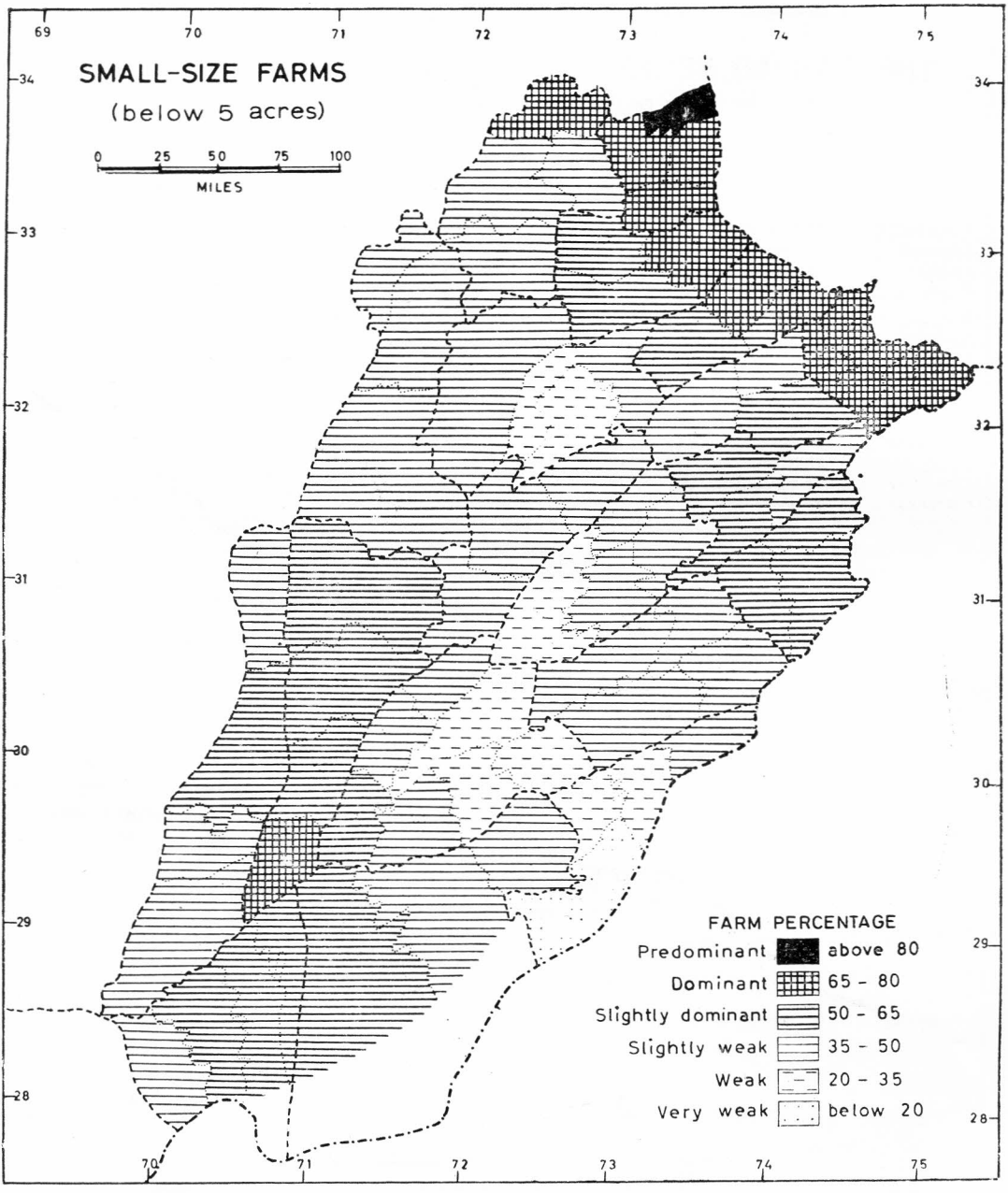

Fig. 2. This map depicts the distribution of small farms (with a size of less than 5 acres) in terms of their percentage to the total number of farms in each *tahsil* of the Panjab Region. The numerical strength of small farms has been categorized into six groups : Predominant (80%+), Dominant (65 to 80%), Slightly dominant (50 to 65%), Slightly weak (35 to 50%), weak (20 to 35%) and very weak (below 20%). Unshaded areas represent desert. The data pertain to the year 1960 and have been derived from *1960 Pakistan Census of Agriculture,* Vol. 2, Report III, West Pakistan (Karachi : Ministry of Agriculture and Works, 1964).

Farm Size Categories and Their Distribution

Farm sizes in the Panjab region vary greatly. The average size of a farm ranges from 1.5 acres in the *tahsils* of Campbellpur, Gujrat and Kharian to more than 200 acres in Murree. Such differences have been generalized into three major categories : 1) Small-size farms (below 5 acres), 2) medium-size farms (5—25 acres), and 3) large-size farms (above 25 acres).[11] The numerical strength (measured on the basis of percentage to the total number of farms) of each of these groups of farms has its own distinct spatial pattern which has been examined in the following sections.

Small-Size Farms

The percentage of small farms in each *tahsil* varies greatly ranging from 12 in Fort Abbas to 88 in Murree. These variations create interesting spatial pattern. The position of small farms, in terms of their percentage in each *tahsil* may be generalized into, predominant, dominant, slightly dominent, slightly weak, weak and very weak (Fig. 2). Each of these generalized categories measuring the position of small farms in various *tahsils* of the Panjab region is areally identifiable. The small farms are predominant in only one *tahsil*. But they occupy a slightly dominant to dominant position in two distinct sections of the region under study : 1) north and northeastern part, and 2) southwestern section. The former extends from Campbellpur *tahsil* on the eastern bank of the Indus to Kasur *tahsil* of Lahore in the east. In this area, the percentage of small farms ranges from 50 to 77. In the southwestern part, the variations in the percentage of small-size farms is relatively less. Alipur *tahsil* of Muzaffargarh district with seventy per cent of small farms, falls in the category of dominant one. Elsewhere they are slightly dominant with percentage ranging from 51 in Shujabad *tahsil* to 65 in Dera Ghazi Khan *tahsil*.

About fifty-eight per cent of the total number of *tahsils* falls in that category where the position of small farms ranges from very weak to slightly weak. In majority of the cases the percentage of smal farms is above 40. This area, with the exception of the trans-Indus *tahsils* of Taunsa, Jampur and Rajanpur of Dera Ghazi Khan district, lies between the two sections of the moderately dominant to dominant categories.

Medium-Size Farms

Variation in the percentage distribution of medium-size farms is not as great as in the case of small farms. It is interesting to note that this group of farm size does not hold predominant position in any *tahsil* and even the dominant position is limited (with 66 per cent) to only one *tahsil* viz., Fort Abbas which records lowest percentage in small farms (Fig. 3). It is the slightly dominant class of the medium-size farms which is more prevalent. This category occupies almost the central part of the region. The percentage ranges from 50 to 64. With the exception of the three *tahsils* of Bahawalnagar, Michenabad and Fort Abbas across Sutlej, the

[11] *Ibid.*

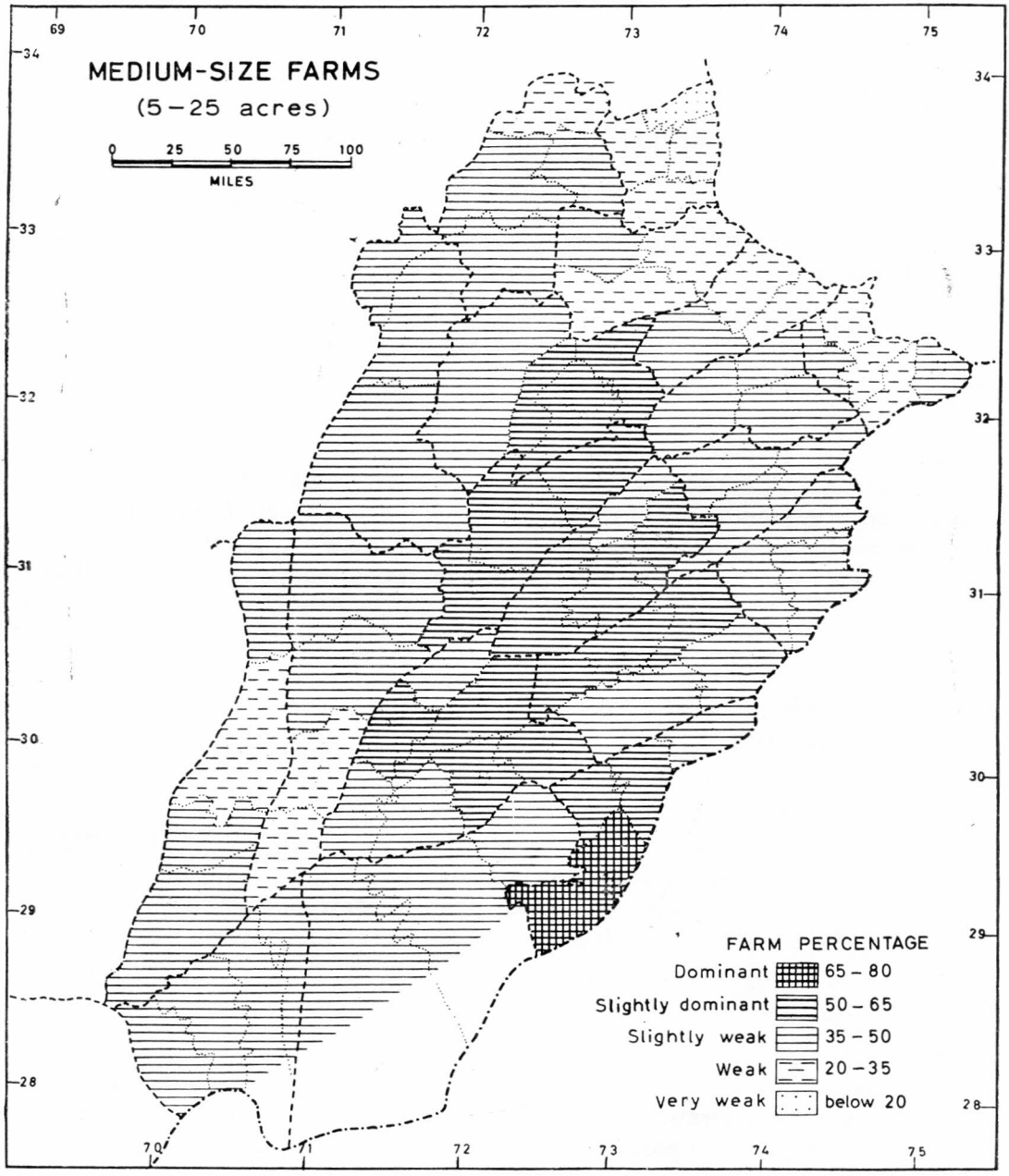

Fig. 3. This map shows the spatial pattern of the medium-size farms. The size of these farms ranges from 5 to 25 acres. The numerical strength of these farms has been measured in similar manner as in the case of small-size farms. It depicts that the medium farms lack a predominant position. Unshaded areas represent desert. Source is the same as for Fig. 2.

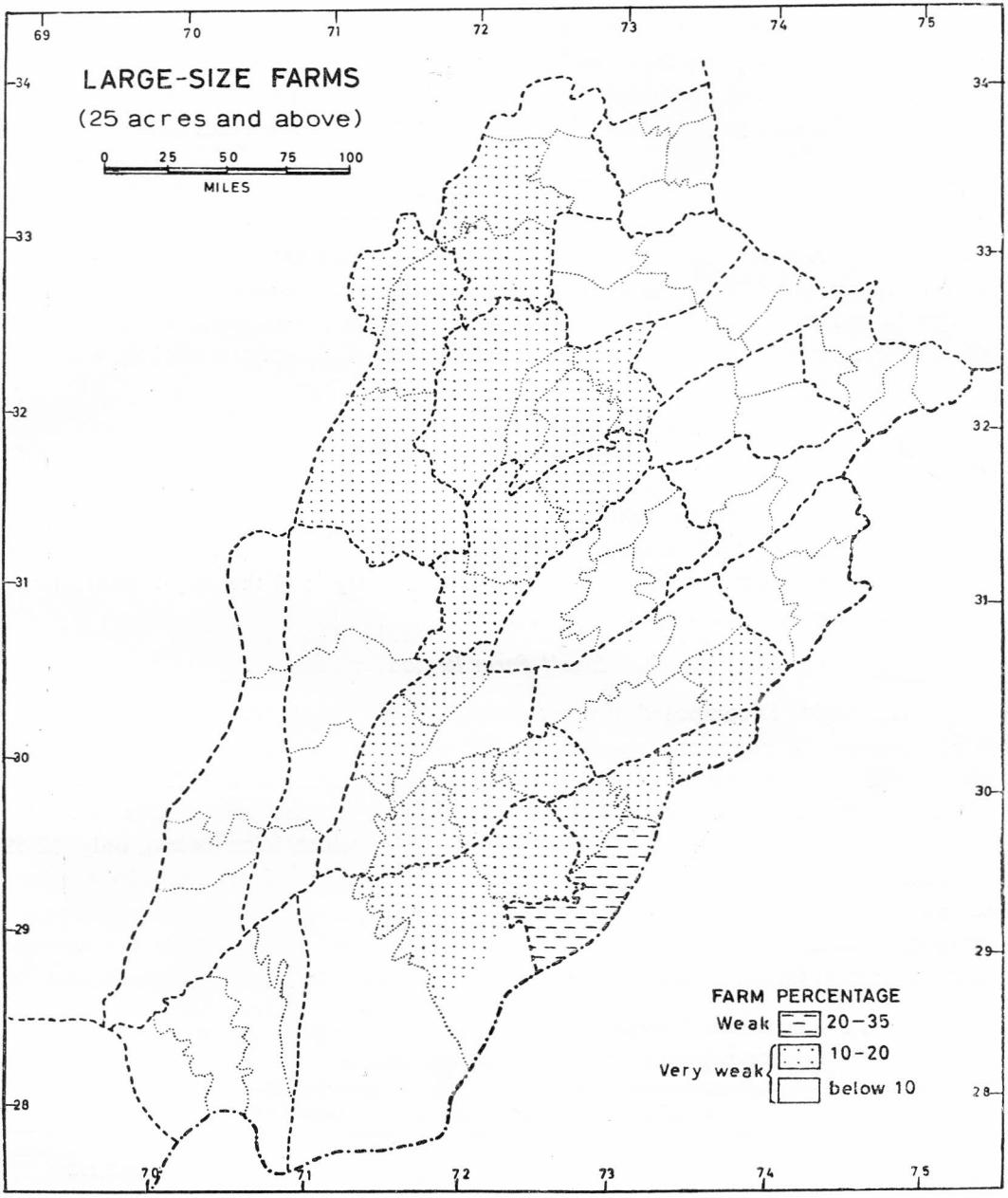

Fig. 4. In this map the distribution of large size farms has been portrayed. Numerical strength has been measured in similar manner as in the case of small farms. The position of large-size farms is weak almost every where. Unshaded areas represent desert. Source is the same as for Fig. 2.

percentage of medium-size farms decreases in all directions. The weak to very weak category of area compares fairly well with the dominant to predominant areas in small farms. Most of the *tahsils* fall in the slightly weak type and many of them, particularly in the Thal, coincide with the similar areas of the small farms.

Large-Size Farms

The position of large farms is very weak in the Panjab region (Fig. 4). The *tahsil* of Fort Abbas is the only exception where its position may be described as weak. In the rest of the region it is very weak. The percentage of large farms ranges from 1 to 7. The range in the percentage decreases particularly in those areas where the positions of small farms and medium-size farms are slightly weak.

The Emerging Pattern

After having examined the distributional pattern of each farm-size category it is only proper to attempt spatial generalization of the three categories of farm size. Three regions can be identified, 1) Small farm region, 2) Medium-size farm region and 3) Small-medium mixed region (Fig. 5). Large-size farm's position is too weak to help them emerge in this pattern. An analysis of the major characteristics of these regions would be worthwhile.

Small Farm Region

This region is composed of those *tahsils* where the percentage of small farms is 50 or more. The size of approximately forty per cent of the small farms in certain districts like Rawalpindi, Jhelum and Gujrat falls under one acre.[12] The percentage of small farms in the region comes to 63.25. This is not comparable with the proportion of the cultivated land in the same category which is much less, only 12.59 per cent of the total farm area in the region. The direction of relationship between the numerical strength of different size-groups of farms and the area under each category of farms is inverse (Table 3). It is interesting to note that the acreage under the small farms, although varies from *tahsil* to *tahsil*, remains much less as

Table 3—Percentage Distribution of various sizes of farms, farm area and its cultivated part in the small-size dominated region

Item	Small farm	Medium farm	Large farm	Total
Number of farms	63.25	33.41	3.3	1,612,152
Farm area	12.59	52.22	35.18	20,951,635 (acres)
Cultivated area	20.45	63.30	16.95	7,626,325 (acres)

Source : Computed from *Pakistan Census of Agriculture*, 1960, Vol. II

[12]These categories have arbitrarily been made by the Census authorities, Government of Pakistan, *op. cit.*, footnote 5, P. xxxi.

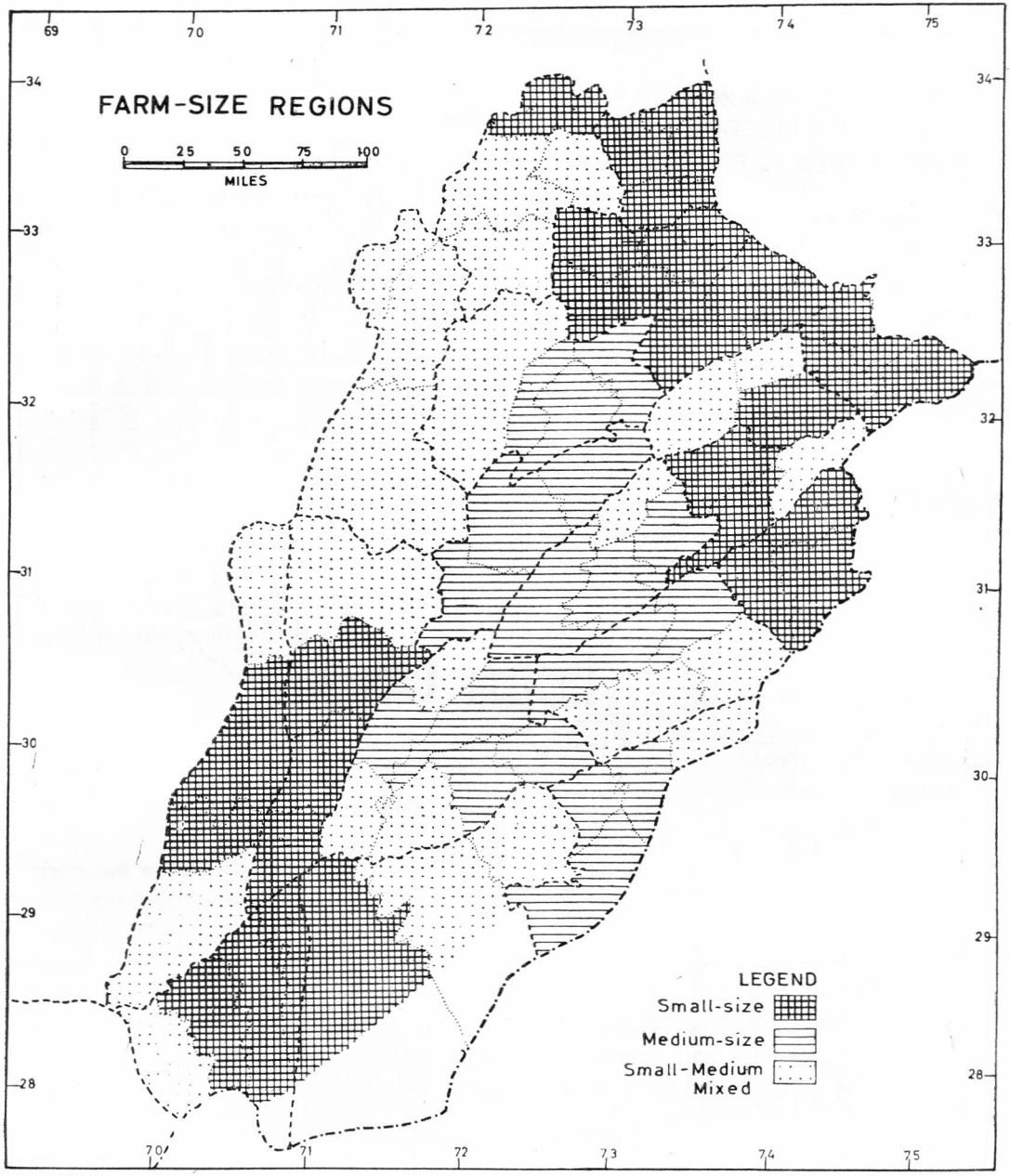

Fig. 5. In this map three types of farm-size regions are depicted: Small farm region, Medium-size farm region, and the Small-Medium mixed region.

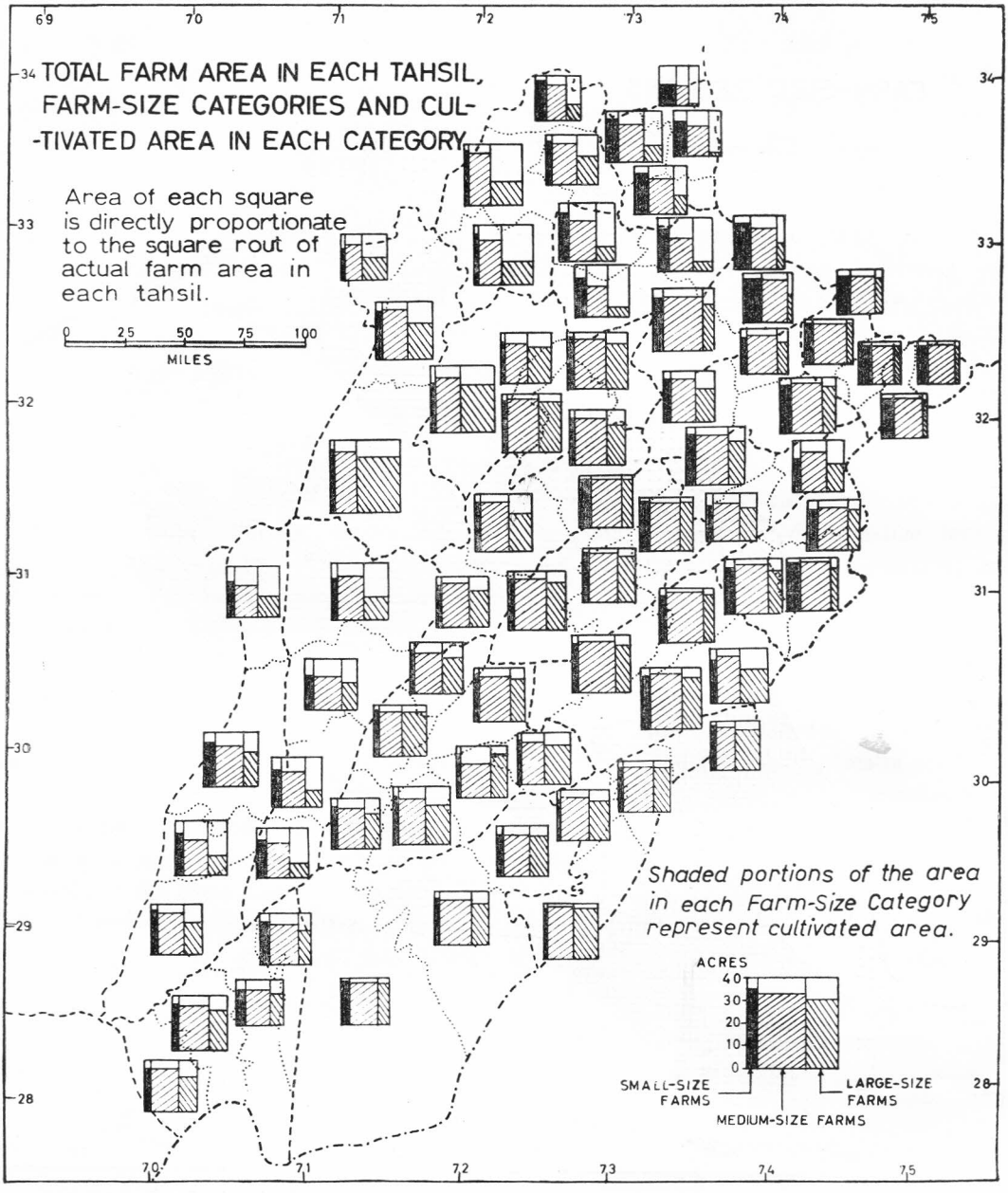

Fig. 6. Three kinds of information have been combined in this map: Total farm area in each *tahsil*, farm size categories, and cultivated area in each category. The area of each square is directly proportionate to the square rout of the total farm area in that *tahsil*. Reading from left, the column in each square represent the acreage under small, medium, and large farms respectively. The shaded portion in each column depicts the extent of cultivated area under different categories of farm size. The map is particularly useful in describing the farm characteristics in the farm-size regions as depicted by Fig. 5. Source is the same as for Fig. 2.

compared to the area under medium-size farms (Fig. 6). The cultivated portion of the area under small farms in each *tahsil* is generally high, excepting Murree. This shows that there is relatively more agricultural pressure on the land under small farms, which is particularly true of the *tahsils* west of Jhelum river (Fig. 6).

Each of the two sectors of this region as described earlier has a distinct spatial characteristics of its own (Fig. 5). In the north and northeastern sector the area west of Jhelum river coincides with the Potwar plateau. The land form of this area is generally characterised by ridge and trough.[13] The occupance history is relatively longer. Mainly dry-farming is practised and wheat and *jowar/bajra* (Sorghum) are the major crops grown. The farmers are generally poor with low per capita income.[14] These conditions limit the investment capacity of a farmer who would till only a smaller piece of land which could be manageable according to his limited resources. Then, the laws of inheritance encouraging fragmentation, and the land tenure system may also be held responsible for the existence of small farms.

The part of the small farm region east of the river Jhelum, in its general characteristics, is similar to the one just discussed. The departure is in the fact that it also includes areas irrigated by canals, where wheat and rice are the major crops grown. The land is relatively better, comprising generally flood and piedmont plains.

The south and south-west sector of the region is different in its settlement history, cropping pattern and irrigation facilities. The settlement started late. Most of the farmers reached there after independence particularly under the programme of refugee rehabilitation. The farming is based entirely on irrigation and cotton-sugarcane is the main crop combination found in the *tahsils* of Rahim Yar Khan, Liaqatpur, Khanpur and Bahawalpur; whereas in the Muzaffargarh district rice and wheat become dominant crops. The crop combination mentioned in connection with various parts of small farm region do not indicate, in any way, the main crops grown on small farms. There are medium-size and large-size farms as well. However, it can be expected that there would be a keen competition among the commercial and food crops and the farmer will have to make a choice. It is quite possible that the leaning of a farmer is towards the cash crop as it is more profitable. The medium and large sizes of farms are generally owned by a small number of persons mainly falling in the category of land lords.

Medium-Size Farm Region

This region spreads over a contiguous area from Indian border in the east to Jhelum river. Here the medium size farms prevail in number as well as in acreage

[13]Colombo Plan Cooperative Project, *Landfarm, Soils and Land Use of the Indus Plain, West Pakistan* (Government of Canada for Pakistan, 1958)., p.

[14]A demographic survey of a few villages in this region, particularly Bhitdargahi, Shahpur and Karamwal by the M. A. final geography students of the Panjab University under the author's guidance in Nov. 1966, revealed that the income per capita was only Rs. 24 per month.

(Fig. 6). More than half of the farm area of the region falls under this category (Table 4). Similar is the situation in the case of cultivated area, and the proportion

TABLE 4—PERCENTAGE DISTRIBUTION OF VARIOUS SIZES OF FARMS; FARMS AREA AND ITS CULTIVATED PARTS IN THE MEDIUM-SIZE DOMINATED REGION

Item	Small farm	Medium farm	Large farm	Total
Number of farms	34.56	55.50	9.92	709,679
Farm area	6.86	57.82	35.30	8,065,056 (acres)
Cultivated area	7.03	59.94	33.02	7,219,131 (acres)

Source : Computed from *Pakistan Census of Agriculture*, 1960, Vol. II

of the cultivated area under medium-size farms in each *tahsil* is generally high (Fig. 6). The acreage under large farms exceeds that under small farms, but the cultivated part thereof is not much.

The significant part of the settlement history in this region began with the introduction of colonization schemes by British Government in the early twentieth century.[15] Under these schemes the peasants living in the thickly populated neighbouring districts of the Panjab were induced to settle in the canal colonies. They were allotted *murabbas* (squares). The size of each *murabba* varied from 22.5 to 27.8 acres[16] and the area allotted to each settler was normally one *murabba*.

Thus, due to the recent history of land occupance in this area, fragmentation of the *murabba* on account of inheritance laws, in majority of the cases for operational porposes, did not take place to the extent of reducing the size to less than five acres. Besides, the possibility that the presence of absentee landlords checks the division of farms into smaller pieces cannot be ruled out.

The farmers in this region are relatively more prosperous than those in the small farm region. The main crops produced here are cotton, sugarcane and wheat. The region as a whole is the most productive part of the Punjab.[17]

Small-Medium Mixed Region

Although, most of the *tahsils* falling in this region are contiguously situated between the rivers Jhelum and Indus, there are some exclaves of this region as well, which are scattered all over the area under study. In this region are included all those *tahsils* in which the percentages of farms in the small and medium-size remains

[15]A review of various projects is presented by R. A. Malik. *Irrigation Development and Land Occupatance in the Upper Indus Basin*, (Mimeographed Ph. D. Diss., Indiana University, 1963), Pp. 82—110.

[16]The size of each *murabba* in Sidhnai was 22. 5 acres; in Lower Sohag, Lower Chenab and Lower Jhelum 27. 8 acres; in Upper Chenab, Upper Jhelum and Lower Bari 25 acres, P. W. Paustian, *Canal Irrigation in the Panjab* (New York, Columbia University Press, 1930), P. 64.

[17]See I. H. Zaidi, *Administrative Areas of West Pakistan : A Geographical Evaluation*, Ph.D. diss., Syracuse University, 1961, map on P. 87. A revised version of the same map is in, Zaidi, "Toward A Measure of the Functional Effecveness of a State, *Annals*, Association of American Geographers, Vol. 56 (1966), P. 58; also see M.K. Elahi, "Efficiency of Agriculture in West Pakistan", *Pakistan Geographical Review*' Vol. 20 (1965), P. 86.

between 30 and 50. The percentage of large-size farms is although greater than it is in other regions but in an overall perspective its position remains weak (Table 5). However, the acreage of the large-sizs farms in the region gains a comparable position with the one under the category of medium-size farms (with the exception of the exclaves formed by Lyallpur-Hafizabad and by Hasilpur and Ahmadpur East). In the five *tahsils* of Fatehjang, Pindigheb, Talagang, Khushab and Bhakkar the acreage of large-size farms exceeds the others.

TABLE 5—PERCENTAGE DISTRIBUTION OF VARIOUS SIZES OF FARMS ; FARM AREA AND ITS CULTIVATED PART IN THE SMALL MEDIUM SIZE DOMINATED RIGION

Item	Small farms	Medium farms	Large farms	Total area
Number of farm	44.54	45.26	10.20	1,005,761
Farm area	7.92	46.81	45.27	11,266,774 (acres)
Cultivated area	8.91	52.23	38.57	8,572,907 (acres)

Source : Computed from *Pakistan Census of Agriculture*, 1960, Vol. II

The main part of this region includes a portion of Salt Range and the Thal area. The reasons for approximately equitable distribution of the small and medium-size farms may be attributed to various factors. Thal is a newly colonized area where fifteen acres of lands (medium-size farms) have been allotted to each settling family.[18] Although the schemes were prepared during British period in the thirties of this century but the implementation could not take place until after independence.[19] The existence of small farms in good number may be ascribed to the tenant and owner-cum-tenant holdings and also partly to the old settlement in the flood plains and the hilly tracts. In the three *tahsils* of Campbellpur, falling in this region, there are a few big land lords and a large number of poor tenants. The land is also uneven.

Besides, as is also the case in the exclaves (excluding Lyallpur-Hafizabad and Shahdara *tahsils*) by owning a piece of agricultural land one gains social status in the community. Driven by the desire of securing social prestige many people from other areas would like to own land in the canal colony, even if it is less than one acre. The less fortunate farmers from other congested areas where the land values are very high come to these newly developed areas or elsewhere where the price of land is low and falls within their purchasing power. Sometimes the land is purchased jointly by various members of a clan (which is generally a *murabba* or less) and then that is subdivided.[20] In addition to these factors, the subdivision of land continues to take place in accordance with inheritance laws.

Lyallpur, being a colony area, is supposed to have a larger percentage of medium-size farms. But because of population pressure and inheritance law, the *murabbas* have been subdivided to make the percentage of small farms comparable

[18]Government of Pakistan, *Ten Years of Thal Development* (Karachi : Department of Advertising, Film and Publications, Sept. 1959), P. 19.

[19]Thal Development Authority, *A Handbook of Thal Development Authority*, (Lahore: Allied Press, 1954), Pp. 18—22, 23.

[20]Information based on personal interview by the author.

with the medium-size ones. Hafizabad and Shahdara are the *tahsils* which, having older settlements are, expected to possess larger number of small farms. But as from these congested, areas, too, people have migrated to the canal colonies leaving their lands in the hands of their relatives, or disposing them off, it is possible that the consolidation of the shares of land might have resulted into the emergence of medium-size farms in sufficiently good numbers.

SUMMARY

Variation in the size of farms and their distributional pattern create observable spatial differences. They have been generalized into three regions : 1) small farm region, 2) medium-size farm region, and 3) small-medium mixed region. Each of these regions has its own peculiar characteristics in terms of the percentage of number of farms, farm area and cultivated area in each size category. This type of regionalism in farm sizes opens the question of their association with various cultural and physical factors. It is on these lines that a number of hypotheses may be constructed and tested in further researches.

DITSRIBUTION OF CITY SIZES IN PAKISTAN

QAZI S. AHMAD

IN his study of "City Size Distributions and Economic Development," Berry recognizes three categories of city-size distributions: rank-size, intermediate, and primate.[1] The intermediate type, according to him, displays three sub-categories: those with more small cities than the primate, those with more medium-sized cities, and those with more large cities. City-size distribution in Pakistan in 1951, as revealed in his study, was intermediate between primate and log-normal distribution, though more primate than log-normal.[2] The shape of the curve for Pakistan indicates that there was a considerable deficiency of cities of intermediate size in the year 1951.

Now, that the 1961 census of Pakistan has made available latest information on the size of cities, it will be of interest to note the changes that have occurred since 1951 in city-size distributions both in Pakistan and in East and West Pakistan separately.

City Size Distributions

A glance at Figures 1, 2 and 3 makes it evident that, on the basis of 1961 census, the distribution of cities in Pakistan as a whole and in East and West Pakistan separately, does not conform to the requirements of the rank-size rule.[3] Of the three curves, the one which approximates the rank-size linear relationship most closely is the curve representing Pakistan. Even here, but much more so in the case of East and West Pakistan, the deficiency of cities of intermediate size is well marked.[4]

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[1]B. J. L. Berry, "City Size Distributions and Economic Development," *Economic Development and Cultural Change*, (July, 1961) p. 582-583.

[2]*Ibid.* See Figure 5, p. 578.

[3]The rank-size rule refers to a statistical regularity which can be observed, when in any area, cities are ranked from the largest to the smallest according to population, and are then plotted on a graph. The size relationship in this case takes the form $P_r . r^{-q} = K$ where q and k are constants, r is the rank of city and P_r is the population of that city. The relationship is linear if the distribution is plotted on a logarithmic scale. See B. J. L. Berry and W. L. Garrison, "Alternate Explanations of Urban Rank-Size Relationships," *Annals*, Association of American Geographers, Vol. 48 (1958), p. 83-91.

[4]The size of a city here refers to the total population of a city (including municipal and cantonment areas and also such areas as industrial estates, etc.) as given in 1961 census bulletins. For example, Dacca city has a population of 556,712, which is the combined population of three different areas: Dacca municipality, Dacca urban area, and Dacca cantonment.

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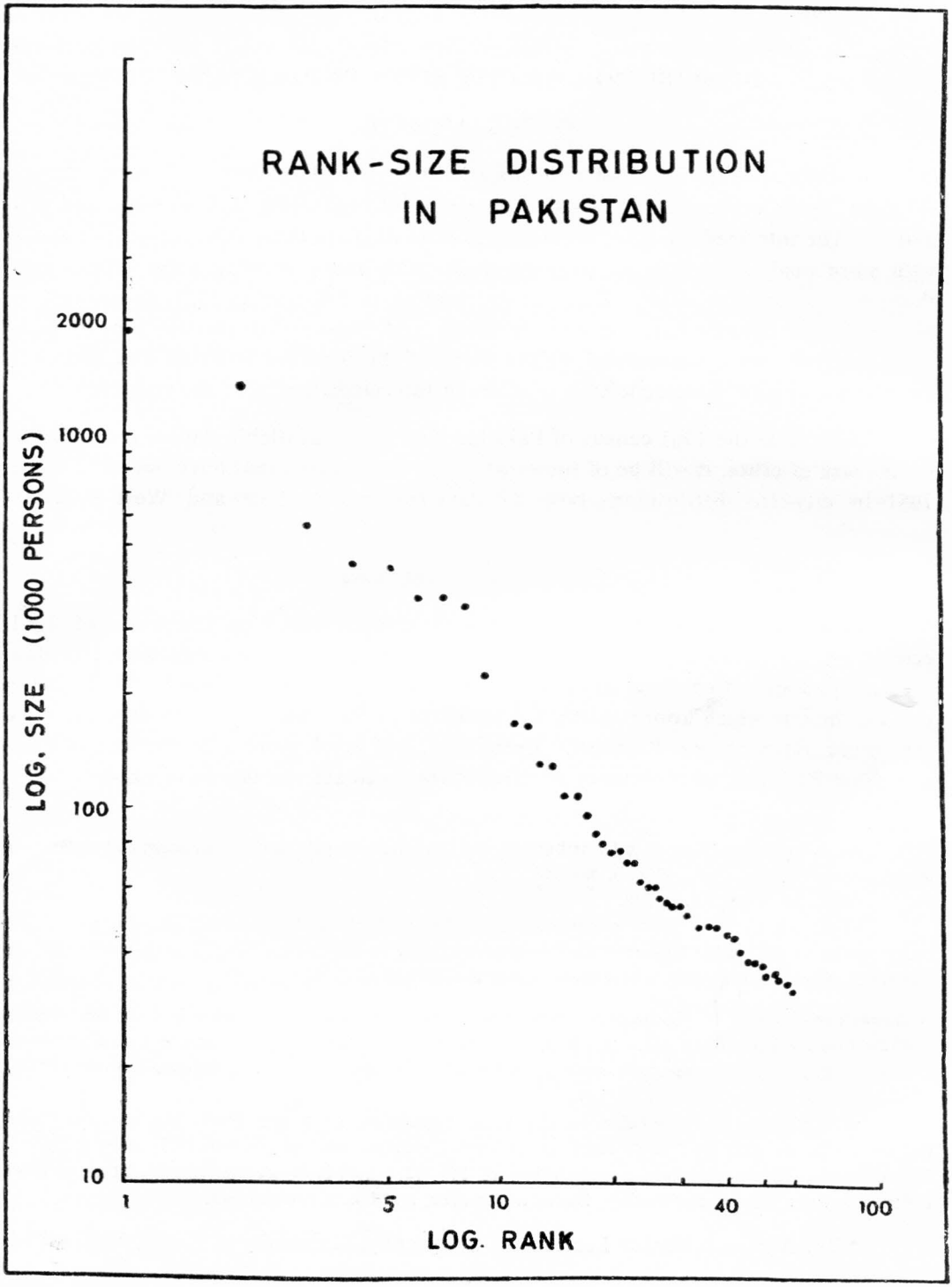
RANK-SIZE DISTRIBUTION
IN PAKISTAN
LOG. SIZE (1000 PERSONS)
2000
1000
100
10
1
5
10
40
100
LOG. RANK

FIGURE 1

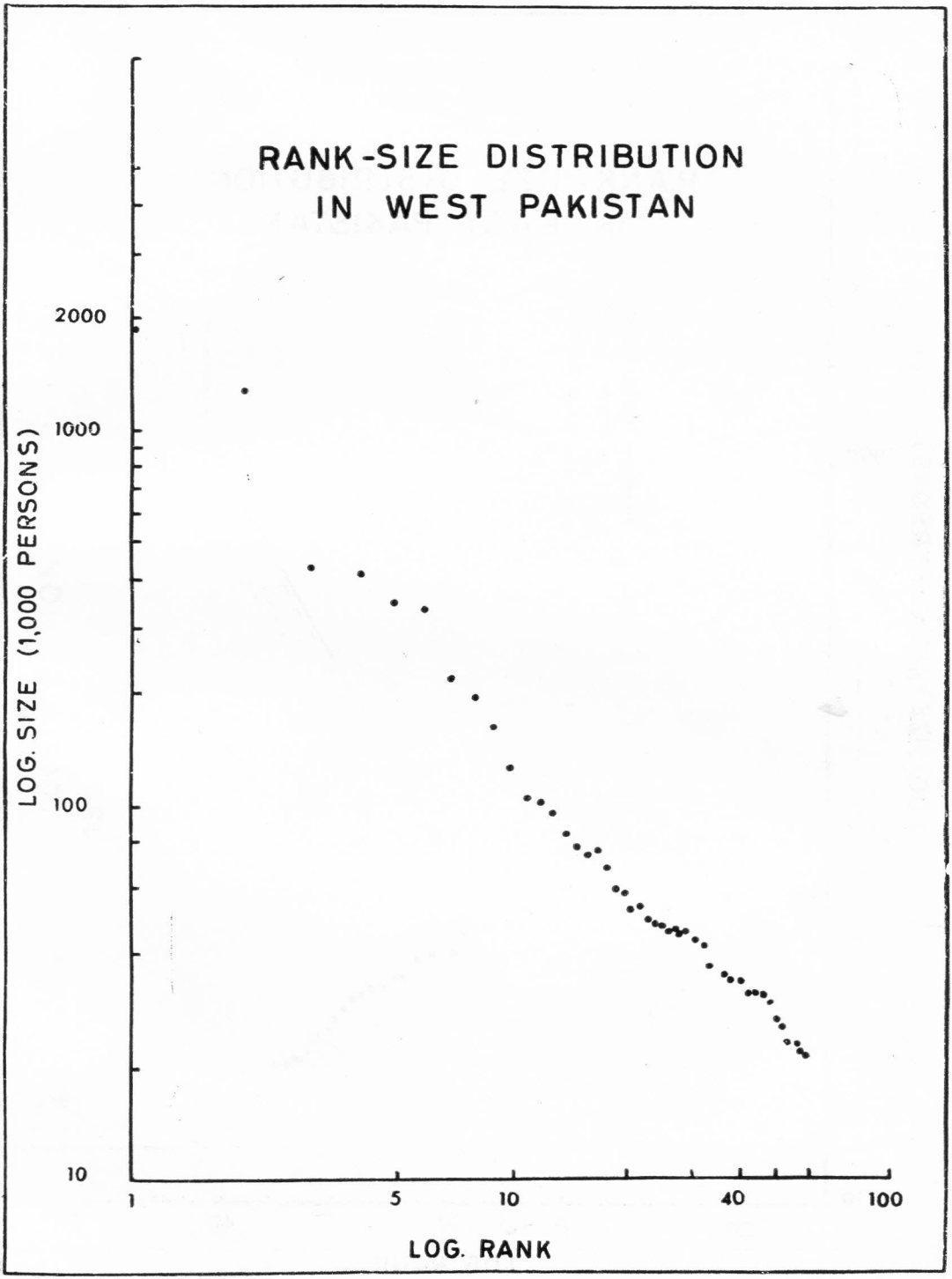
RANK-SIZE DISTRIBUTION
IN WEST PAKISTAN
LOG. SIZE (1,000 PERSONS)
2000
1000
100
10
1
5
10
40
100
LOG. RANK

FIGURE 2

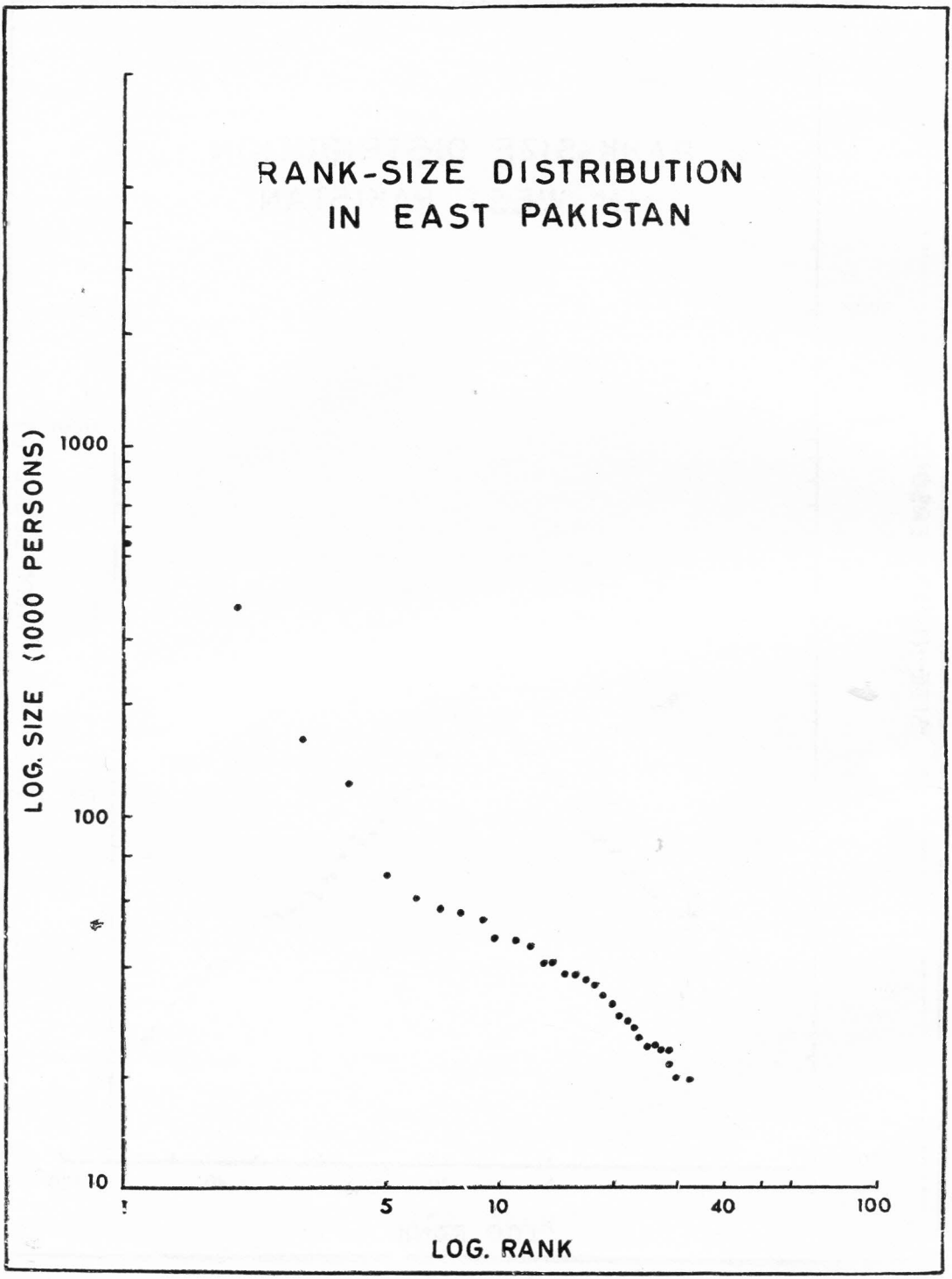
RANK-SIZE DISTRIBUTION
IN EAST PAKISTAN
LOG. SIZE (1000 PERSONS)
1000
100
10
5
10
40
100
LOG. RANK

FIGURE 3

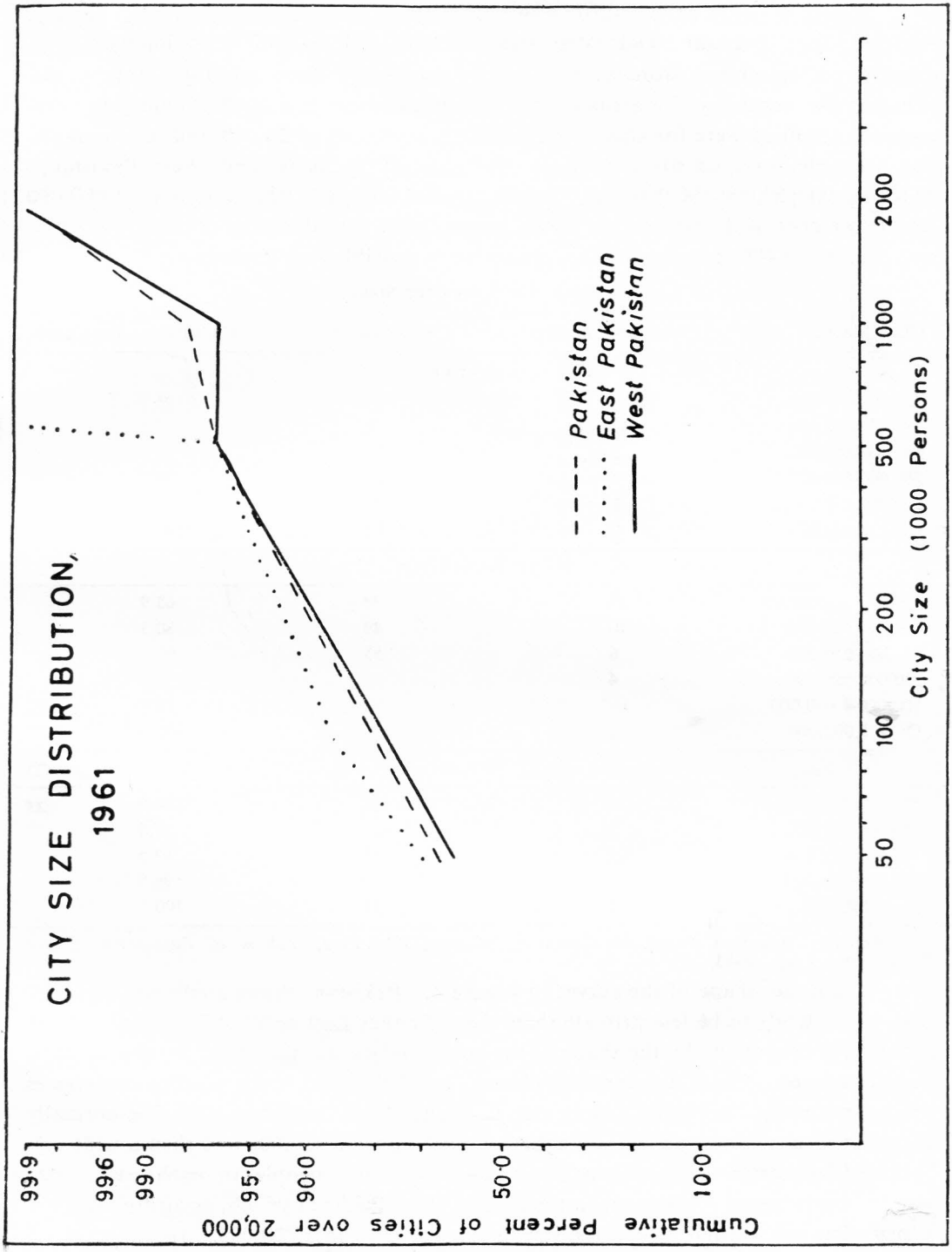
CITY SIZE DISTRIBUTION, 1961
Pakistan
East Pakistan
West Pakistan
Cumulative Percent of Cities over 20,000
99·9
99·6
99·0
95·0
90·0
50·0
10·0
50
100
200
500
1000
2000
City Size (1000 Persons)

FIGURE 4

Figure 4 contains best-fitting curves to three city-size distributions, namely, Pakistan, East Pakistan, and West Pakistan. In each the plot is of cumulative frequencies on log-normal probability paper, so that if city sizes are log-normally distributed the resulting plot assumes the form of a straight line.[5] The cumulative frequencies obtained were for cities with populations exceeding 20,000 and the cumulation proceeded over six size classes (in the case of Pakistan and West Pakistan): 20,000-50,000; 50,000-100,000; 100,000-250,000; 500,000-1,000,000; and over 1,000,000 to 100 per cent of the population at the largest city. In the case of East Pakistan; and over 1,000,000 five parallel size classes were possible (see Table).

TABLE—DATA ON CITY SIZES

Class Marks	Frequency Number	Cumulative	Cumulative Per Cent
	PAKISTAN		
20,000-50,000	61	61	66.3
50,000-100,000	15	76	82.6
100,000-250,000	8	84	91.3
250,000-500,000	5	89	96.7
500,000-1,000,000	1	90	97.8
Over 1,000,000	2	92	100.0
	WEST PAKISTAN		
20,000-50,000	39	39	63.9
50,000-100,000	10	49	80.3
100,000-250,000	6	55	90.1
250,000-500,000	4	59	96.7
500,000-1,000,000	—	59	96.7
Over 1,000,000	2	61	100.0
	EAST PAKISTAN		
20,000-50,000	22	22	70.9
50,000-100,000	5	27	87.0
100,000-250,000	2	29	93.5
250,000-500,000	1	30	96.8
Over 500,000	1	31	100.0

Source: Based on *Population Census of Pakistan, 1961, Final Tables of Population,* Census Bulletin No. 2, pp. 68-95.

Note the shape of the curves in Figure 4. Pakistan shows a city-size distribution which tends to be less primate than that of either East or West Pakistan. Other differences as revealed by the shape of the curves relate to variation in the relative distribution of cities in different size classes. In all the three cases, smaller size classes are log-normally distributed. Both Pakistan and West Pakistan have log-normally distributed city sizes up to an urban population of 500,000 and then a wide gap followed by a primate capital city of well over a million people in each case. The gap is much more prominent in the case of West Pakistan which, according to 1961 census, has not a single city in the size bracket 500,000 to 1,000,000. In the case of

[5]Berry, *op cit.*, footnote 1, p. 575

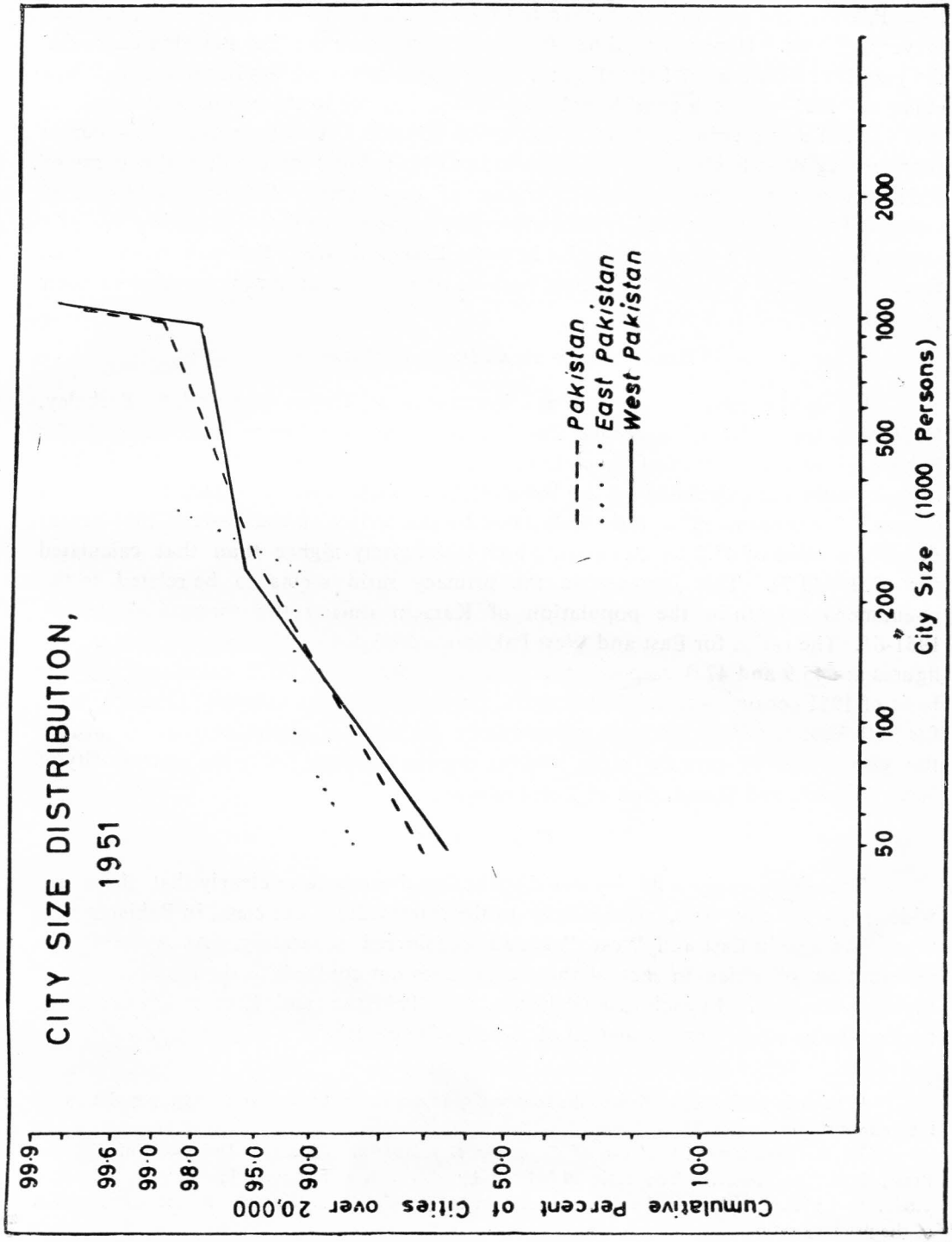
CITY SIZE DISTRIBUTION,
1951
Pakistan
East Pakistan
West Pakistan
City Size (1000 Persons)
50
100
200
500
1000
2000
Cumulative Percent of Cities over 20,000
99·9
99·6
99·0
98·0
95·0
90·0
50·0
10·0

FIGURE 5

East Pakistan the gap appears earlier and the cumulation to the primate city (Dacca) is very abrupt. Here it would be of interest to compare the East Pakistan curve for the year 1961 with that of 1951 (Fig. 5). The major difference lies in the fact that the curve of 1951 shows a considerable gap which was due to the complete absence, in that year, of any city in size bracket 100,000 to 250,000. A comparison of the curves representing West Pakistan for the years 1951 to 1961 shows clearly that the curve of 1961 has a much more extended section of log-normally distributed city sizes as compared to the one for 1951. This, evidently, is due to the fact that during the past intercensal decade, a number of cities in both East and West Pakistan have shifted from a lower to a higher size class because of a somewhat abrupt increase in their population.

Relationship to an Index of Primacy

Using the measure devised at International Urban Research,[6] Berkeley, California, the *Atlas of Economic Development* gives a primacy ratio of 45.2 for Pakistan,[7] which is in fact much lower than the world mean of 55 per cent.[8] This primacy ratio was calculated on the basis of the statistics made available by the 1951 census of Pakistan. The ratio calculated by this writer on the basis of 1961 census data has a value of 45.5 for Pakistan, which is definitely higher than that calculated for 1951 (42.7). This increase in the primacy ratio seems to be related to the phenomenal growth in the population of Karachi during the intercensal period, 1951-61. The ratios for East and West Pakistan calculated on the basis of 1961 census figures are 45.9 and 47.0 respectively, as against 42.6 and 44.5 calculated on the basis of 1951 census figures. Here, again, the increase in the values of primacy ratios for both East and West Pakistan appears to be the result of a phenomenal growth in the population of primate cities in these regions (Karachi being the primate city of West Pakistan and Dacca, that of East Pakistan).

Conclusions

The above analysis of city-size distribution demonstrates clearly that there are wide gaps in city sizes, particularly in the intermediate size class, in Pakistan as a whole and also in East and West Pakistan considered separately. As a result the distribution of cities in each of these areas does not conform to the requirements of the rank-size rule. In each case (Pakistan, West Pakistan and East Pakistan) there appears to be closer approximation of the city-size distribution to primacy.

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[6]The ratio of the population of the largest city in a country to the combined population of the first four cities.

[7]N. S. Ginsburg (ed.), *Atlas of Economic Development* (Chicago : University of Chicago Press, 1961), pp. 36-37. The ratio calculated by this writer, however, has a value of 42.7. This may be due to the use of a different total for the population of Karachi in the computation of the primacy ratio.

[8]*Ibid.*

How long this situation will last is a matter of conjecture. However, in view of the rapid pace of urbanization and steady transformation of purely agrarian economy into an agrarian-cum-industrial economy it is expected that by the end of this century city-size distribution in Pakistan would approximate the rank-size linear relationship. It is possible that this expectation may not come true as the larger cities may continue to grow at an accelerated rate maintaining the existing gap in city-sizes. What is needed, then, is a reappraisal of the city-size distribution in Pakistan at regular time-interval, preferably at the end of each decennial census.

HISTORICAL BACKGROUND OF THE PORT OF CHITTAGONG

S.H.H. NAQAVI and M. RAFIUL KARIM

NO reliable record is available about the origin and the first location of the port of Chittagong. Nor is there available any definite history of the early evolution of Chittagong, either as a port or as a town. The meagre knowledge we have of early Chittagong is based mostly on the records and accounts left by the traders and travellers who visited it mostly between the eighth and the seventeenth centuries.

Early History

The first mention of Chittagong is found in the *Periplus of the Erythream Sea*, a book written in the first century A. D. The exact words in the *Periplus* are :

> Ganges comes into view and near it, the very last land towards the east, Chryse . . . . . on its bank is a market town. Just opposite this river, there is an island in the ocean, the last part of the inhabited world towards the east under the rising sun, itself; it is called Chryse.[1]

Bhattasali has identified the island of Chryse with the island of Sandwip. If Chryse is Sandwip then the market town referred to above may very well be Chittagong. In the *Periplus* the exports mentioned are spikenard, pearls and muslins. In Rome, there was a great demand for muslins and many Roman ladies of the fashionable set were clad in fine muslins from Bengal.[2]

Ptolemy writing his *Geography* in about 150 A. D. mentioned the Sandwip channel in the Chittagong coast. He referred to five branches of the Ganges. The western-most, termed Kambyson mouth, was located at longitude 144°30′ and latitude 18°15′. The eastern-most, called Antibole, was at longitude 148°30′ and latitude 18°15′.[3]

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[1]W. H. Schoff (Ed.), *Periplus of the Erythream Sea*, trans. (London : Longmans, 1912), pp. 47-48.

[2]N. Ahmad, *An Economic Geography of East Pakistan* (London : Oxford University Press, 1958), p. 103.

[3]J. W. McGrindle (Ed.), *Ancient India as described by Ptolemy* (London : Trubner and Co., 1885), pp. 72-73.

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Bhattasali, having definitely established the western-most Kambyson mouth as the Bhagirathi mouth, identified the eastern-most Antibole mouth with the Sandwip Channel between Sandwip and Chittagong coast. Bhattasali also showed that the eastern-most course was also the principal course of the Ganges in the days of Ptolemy.[4]

From the Tibetan works *Pagsam Zon Zan* of Sumpa Khanapo and *Kahbah Dun Dan* of Lama Taranath, we learn that in the third century A. D. the seat of government was at Catigrama (modern Chittagong) in the East Bengal . . . . . it was the headquarter of Buddhism after the decline of Nalanda. In the city of Catigrama or Catigao, there was a large Buddhist monastry called Pandit Vihara.[5]

These statements go a long way to show that Chittagong was a famous seat of learning, trade and commerce at least sixteen centuries ago.

Seventh Century A. D.—Tenth Century A.D.

Not long after that, Chittagong was frequently visited by Chinese vessels. There is positive evidence to show that during the reign of the Tang Dynasty (618 A. D. to 906 A.D.) Chinese sailors were very much acquainted with the navigation of the Indian seas.[6] It may well be concluded that the Chinese must have had trading relations at that time with Chittagong, since by that time Chittagong was already an important port and city of Bengal.

The Arab geographers who discovered the trade route to India in the eighth and ninth centuries, frequently referred to a commercial town, named Samandar. Very few attempts have been made to identify Samandar, but recently Dr. A. Karim has convincingly identified Samandar as Chittagong.[7]

Arab Geographers' Evidence

Several Arab geographers wrote of Samandar. Ibn Khurdadhbeh, who died in 912 A. D., wrote :

> Rice is produced here. Aloe is imported to this place from a distance of 15 or 20 days' journey through sweet water from Kamrun (Qamrup) and other places.[8]

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[4]N.K. Bhattasali, *Science and Culture*, "Antiquity of the Lower Ganges and its courses," Volume 7, No. 5 (1941), pp. 237-238.

[5]S. C. Das, "Antiquity of Chittagong", *Journal of the Asiatic Society of Bengal*, Volume 67, (1898) p. 22.

[6]G. Philip, "Mahuan's Account of the Kingdom of Bengal". *Journal of the Royal Asiatic Society of Great Britain and Ireland*, Vol. 27 (1895), p. 525.

[7]A. Karim, "Samandar of the Arab Geographers" *Journal of the Asiatic Society of Pakistan*, Vol. 8, No. 2 (December, 1963), p. 22.

[8]Quoted in Karim, *ibid*, p. 13.

Al Idrisi wrote in 1154 A. D. :

Samandar is a large town, commercial and rich, where there are good profits to be made . . . . . rice and various grains especially excellent wheat are to be obtained here . . . . . Aloe wood is brought hither from the country of Kamrut (Kamrup) 15 days' distance by a river of which the waters are sweet. The aloe wood which comes from this country is of superior quality and of a delicious perfume. It grows in the mountains of Karan. One day's sail from this city, there is a large island well peopled and frequented by merchants of all countries.[9]

Apart from the records of the Arab geographers who visited Chittagong in the eighth and ninth centuries, no other evidence of Chittagong as a port is available excepting in the accounts left by a number of travellers.

Travellers' Accounts : Eleventh Century to the Sixteenth Century A.D.

From these travellers we learn that within a hundred year or so, the Samandar that the Arabs visited, was so well developed that it replaced the then well-known Tamluk Port in its importance and utility. The renowned Muslim traveller Idrisi visited Chittagong port and he called Chittagong in his works as 'Carnaful'.[10]

Marcopolo : In 1294 A. D. Marcopolo came to Chittagong from Arakan and found it a most flourishing port.[11] Herbert writing in 1313 A. D. mentioned Chittagong as one of the most densely peopled and prosperous towns.[12]

Ibn Batutah : He came to Chittagong in 1341 A. D. and wrote :

"The first port of Bengal which we entered was Sudkawan; it was a great city situated on the shore of the vast ocean.[13]

There was some controversy regarding the identification of Sudkawan. However, Bhattasali's arguments on this point are compelling and his identification of Sudkawan with Chittagong is convincing.[14]

Nicolo di Conti : About forty-nine years after Ibn Batutah's visit, the Venetian traveller, Nicolo di Conti, came to Chittagong. His accounts show that he went to Arakan from Chittagong port.[15]

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[9]Quoted in Karim, *Ibid*, p. 14.

[10]Nur Ahmad, "Some Glimpses About the Origin and Location of Chittagong Port and Chittagong Town", *Port of Chittagong Quarterly* (October, 1962), p. 9.

[11]*Ibid*, P. 9.

[12]*Ibid.*, P. 9.

[13]C. Defremery and B. R. Sangineth, Voyges d'Ibn Batoutah, Vol. 4 (Paris : L 'Imprimerie Nationale, 1893) p. 12 [Quotation is translation]

[14]Karim, *op. cit.*, footnote 7, p. 19.

[15]Ahmad, *op. cit.*, footnote 10, p. 10.

Mahuan : In 1406 A. D. six years after di Cont's visit, the famous Chinese traveller, Mahuan, came to Chittagong. From Mahuan's account we learn that :

> The kingdom of Pangko-la, Bengala, is reached by ship from the Kingdom of Sumen-tala as follows : A course is shaped for the Maoshor island and Tsui-lan Island : these being reached, the vessel then has to steer north-west and being favoured with a fair wind for twenty-one days arrives first at Chetigan where she anchors. Small boats are then used to ascend the river.[16]

Possibly, either there was no other notable port in Bengal at that time or only Chittagong had had sufficient draught to attract large trading vessels. Up the Meghna, the available depth probably was not sufficient for large vessels and hence, could not give rise to any notable port.

The goods that were produced in Bengal at that time and were then the major export of Chittagong, according to Mahuan, were rice . . . . . wheat, sesame, all kinds of pulses, millet, ginger, mustard, onions, hemps, quash, brinjal and vegetable of many descriptions . . . . . Among their manufactures are five or six kinds of fine cotton fabrics (muslins).[17]

There were two notable Chinese ports at that time. One was at Chin-Chew and the other was located at the mouth of the Chang-Chow. It is probable that Chittagong had frequent visits from these ports which did much of the foreign trade of that part of China between 1086 A. D. and 1566 A. D.[18]

Yen Tsong Kien : Mahuan's account of Chittagong was followed by another work, *Shu-Yu-Chou-tse-lu*, compiled in 1574 by Yen Tsong Kien, which records that :

> Tsati-Kiang (Chittagong) is at the mouth of the sea. Merchants from foreign countries come from outside and anchor there. They assemble and divide their merchandise at this place.[19]

The products of the country, of which a considerable quantity was exported from Chittagong, included cotton clothes, Sahalo (Shawl), woollen carpets, tulokin, crystal, pearls, precious stones, opaque glass, sugar, honey, ghee and peacock's feather.[20]

Portuguese Period : Sixteenth and Seventeenth Centuries A. D.

From the mention of Chittagong as "Porte Grande" by Ralph Fitch and Sebastian Manrique who visited Chittagong in 1585 A.D. and 1640 A.D. respectively, it

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[16]Philips, *op. cit.*, footnote 6, p. 529.

[17]*Ibid.* P. 531.

[18]*Ibid.* P. 526.

[19]Bagchi "Political Relations between Bengal and China," *Visva Bharati Annals*, Vol. 1 1945), p. 127.

[20]*Ibid.* P. 132.

would appear that the Portuguese had succeeded in gaining a footing there by the middle of the sixteenth century. The Portuguese first began to visit Bengal towards 1517 and fortresses and factories were built in Chittagong and Satgaon (near the modern town of Hughli in West Bengal) in 1536-37.[21]

Within a few years of their settlement in Chittagong the Portuguese became the masters of trade in Bengal. Chittagong became the most important port of Bengal to the Portuguese because of its location, safe anchorage and navigational facilities, close to the mouth of the Meghna which was the principal route to the Royal capital of Gour.[22] Owing largely to the Portuguese trade, Chittagong became such an important port that the Portuguese started to call it ' Porte-Grande" (great port) in contradistinction to "Port Pequno" (small port), a name given to Satgaon, the modern port of Calcutta.[23]

So much did Chittagong flourish during the time of the Portuguese that it came to be known as 'the chief town of Bengala'.

De Barros : De Barros writing in 1552 A.D. found that :

> Chatigam is a most famous and wealthy city of the Kingdom of Bengal by reason of its port at which meets the traffic of all that eastern region.[24]

De Barros' map clearly shows Chatigam as a major port on the right bank of the river that enters the Bay from the north east.

Misira : In 1565 A.D. the Venetian traveller, Misira, came to the flourishing port of Chittagong. He noted that :

> Every year 2 (two) hundred ship-loads of salts used to be exported to Europe from Chittagong and between Sandwip and Chittagong there were available ample ship building materials such as timber and other materials and that the Sultan of Turkey used to get their ships built at Chittagong at a cheaper cost.[25]

Caesaro Frederici : According to Frederici, who came to Chittagong in 1567 A.D., there was much commerce in silver between Chittagong and Pegu.[26] At that time Chittagong port was the main port for silver trade.[27]

Frederici found more than eighteen ships anchored at Chittagong and he wrote that from this port great store of rice, very great quantity of bombast cloth of every sort,

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[21]Ahmad, *op. cit.*, footnote 2, p. 103.

[22]L.S.S. O'Malley, *Eastern Bengal District Gazetteer, Chittagong*, (Calcutta : The Bengal Secretariat Book Depot, 1908), p. 26.

[23]S. M. Afzal, "Porte-Grande", *Port of Chittagong Quarterly*, Vol. I, No. 1 (October, 1962), p. 1.

[24]Quoted in O'Malley, *op. cit.*, footnote 22, p. 26.

[25]Quoted in Ahmad, *op. cit.*, footnote 10, p. 10.

[26]O'Malley, *op. cit.*, footnote 22, p. 26.

[27]Ahmad, *op. cit.*, footnote 10, p. 10.

sugar, corn and honey with other merchandise[28] were carried to the Indies. He wrote further that the Portuguese loaded their ships at Chittagong with rice, cloth of bombast of diverse sorts, lacca, great abundance of sugar, myrobolan, dried and preserved long pepper, oyle of Terseline and many other sorts of merchandise.[29]

Ain-i-Akbari's Evidence : Towards the latter part of the sixteenth century, Portuguese settlement at Chittagong was in a flourishing state. According to *Ain-i-Akbari*, written in about 1590, "To the east and south of Bengal is an extensive Kingdom called Arakhang. The port of Chatigaon belongs to it."[30] The *Ain-i-Akbari* further mentioned Chittagong as a large city situated among trees on the banks of the sea which is a great emporium, being the resort of Christian and other merchants.[31]

Von Linschoten : By the end of the sixteenth century and the beginning of the seventeenth century, many Portuguese writers and geographers started to call Chittagong the 'city of Bengala' Von Linschoten in 1598 A.D. termed Chittagong as the 'Chief town of Bengala', though he wrongly located it fifty miles eastward from the mouth of the river for he wrote "from this river eastward fifty miles lyeth the town of Chatigam which is the chief town of Bengala".[32]

Duarte-de-Barbosa : Duarte-de-Barbosa, one of the earliest Portuguese writers on the Indian coasts, wrote :

> This sea (Bay of Bengal) is a gulf which enters towards the north and at its inner extremity, there is very great city inhabited by the Moors which is called Bengala.[33]

Stanley identified the city of Bengala as Chittagong and in a note said that where Ortelius placed Bengala, Hommanus placed Chatigam or Chittagong.[34]

Sebastian Manrique : Sebastian Manrique, who came to Chittagong in 1640 A.D., wrote that the principal things the Portuguese brought to Bengal from Malacca, Sumatra and Borneo were "brocades, brocateles, cloth, velvets, damasks, satins, *taffetas*, *tafrosinas*, *taffisirias escomillas* or 'Muslins' of all colours but black which colour was considered ill-omened in Bengal".[35]

The Portuguese also brought to Chittagong from Malacca, cloves, nutmegs and mace [from Malacca], and from Borneo the highly prized camphor. They brought

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[28]Quoted in J.J.A. Campos, *History of the Portuguese in Bengal*, (London and Calcutta: Bullerworth & Co., 1919), p. 113.

[29]*Ibid*, p. 114.

[30]Quoted in S. M. Ali, *History of Chittagong*, (Dacca : Standard Publishers, 1964), p 33.

[31]Quoted in O. Malley *op. cit.*, footnote 22, p. 26.

[32]Quoted in Campos, *op. cit.*, footnote 28, p. 74.

[33]*Ibid*, p. 76.

[34]*Ibid*, p. 76.

[35]*Ibid*, p. 115.

cinamon from Ceylon and pepper from Malabar. From China they brought silk, gilt furniture such as bedsteads, tables, coffers, chests, writing desks, boxes and very valuable pearls and jewels.[36]

From the islands of Maldives, the Portuguese brought sea-shells which during the period of Hindu kings, were current in Bengal as coins and were known as *cowries*.[37] They imported from Solan and Timor both white and red varieties of sandal wood which was much prized in Bengal at that time.[38]

Pyrard de Laval: The Portuguese shipped various things from Bengal. Pyrard de Laval who visited Bengal in the beginning of the seventeenth century found :

> That the inhabitants (of Bengal) both men and women are wonderously adroit in all such manufactures as cotton cloth and silks and in needle work such as embroideries which are worked skilfully down the smallest stitches t hat nothing prettier is to be seen anywhere.[39]

To export such commodities as rice, butter, oil and wax one hundred ship were annually laden in the ports of Bengal. However, most of these ships were to be found in Chittagong.

The prosperous port of Chittagong that had flourished so much as to be called 'Porte Grande' in the sixteenth century started to decline by the beginning of the seventeenth century, probably due to the decline in the trade and commerce of Bengal as a result of frequent political changes that were taking place in the country at that time. Chittagong's trade dwindled and the trading and adventurous Portuguese, giving up trade, took to piracy as their means of sustenance. From 1611 A.D. to 1665 A.D., the history of the Portuguese in Chittagong was the 'history of the Portuguese in the worst form'.[40]

The conquest of Chittagong by Shaista Khan, the Mughal Governor of Bengal, in 1665 A.D. broke the power of the Portuguese pirates for ever and a peaceful trade, though small in magnitude, started once again to flow out from Chittagong. In the next hundred years, with the rise of Hughly as a major outlet for the products of Bengal, Chittagong sank into obscurity till in 1760 A.D. it was peacefully handed over to the British.

The British period : 1760—1947 A.D.

The decline in the prosperity of the port during the hundred years or so immediately before the British arrived, had been due to several causes such as the

[36]Campos, *op cit.*, footnote 28, p. 115.

[37]*Ibid*, p. 115.

[38]*Ibid*, p. 115.

[39]*Ibid*, p. 117.

[40]*Ibid*, p. 155.

long domination of the land travelling Mughals, the occurrence of earthquakes and the rise of Calcutta.[41] Raynal (1777) says that :

> Chittagong sank into obscurity till the British arrived and that the fortification which they [the Mughals] had begun to erect having been thrown down by frequent earthquakes, they had taken a dislike to the place.[42]

That the rise of Calcutta as a port contributed to Chittagong downfall is implied by the writer of *Riyauzu-us-Salatin* (1786—1788 A.D.) who said :

> . . . . . in ancient times, Chittagong was a large port. The traders of every country, especially the ships of the Christians, used to frequent it. But at present since Calcutta is a large port, all other ports of Bengal have fallen into decay.[43]

Since then the history of the port of Chittagong continued to be uneventful till 1899 A.D. when the first jetty for berthing of ocean-going vessels was brought into use.[44] The decaying condition of the port of Chittagong under the British for over hundred years, from 1770 to 1899 A.D. was mainly due to the growth of Calcutta as a major port and metropolis of Bengal. With the development of Calcutta as the seat of government and as a modern city, industries as well as financial institutions flocked to that city. As a result, the importance of Calcutta as a port also grew and it became the main gateway through which the bulk of the trade of even the eastern part of Bengal flowed. Thus, the importance of the natural port of Chittagong diminished and in consequence, its growth and development were neglected.[45]

The Assam-Bengal Railway : The Assam-Bengal Railway, a limited Company formed in England in 1892, advised the government of India that the success of the Assam-Bengal Railway, then under construction, depended largely on the construction of jetties at Chittagong for the sea-going vessels.

Construction of the Jetties : However, the idea of constructing jetties in Chittagong was opposed by the vested interests in Calcutta and the Joint Steamer Company. The former did not like the idea of parting with any part of their trade while the latter apprehended that the Assam-Bengal Railway would prove a formidable competitor for the inland transportation of goods. However, after a long-drawn contest, sanction was given for the construction of a jetty at Chittagong, at Government expenses, by the Assam-Bengal Railway and the first jetty was brought into use in 1899 A.D.[46]

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[41]O'Malley, *op. cit.*, footnote 22, p. 40.

[42]*Ibid*, p. 40.

[43]*Ibid*, p. 40.

[44]Afzal, *op. cit.*, footnote 23, p. 2.

[45]*Ibid*, p. 2.

[46]M. A. Barry, "Sixty-six years of the port of Chittagong". *The Monthly Bulletin of the Port of Chittagong* (February, 1956), p. 3.

Soon thereafter, it was felt that one jetty was not sufficient to handle the traffic of the port of Chittagong, and in 1904 another jetty went into commission. With the formation in 1906 of the new provinces of East Bengal and Assam for whose trade Chittagong was an ideal port. The provincial governments naturally became very much interested in the development of the port of Chittagong and as a result of their efforts, two more jetties were added to the port of Chittagong, one in 1906 and the other in 1910.

The port showed considerable development until 1912 when the newly created province was annulled and East Bengal was again amalgamated with the Presidency of Bengal. The interest of the Presidency of Bengal in the port of Calcutta, which was the provincial capital, naturally overshadowed that in the port of Chittagong situated at a remote extremity of the province.[47]

Thus, between 1910 and 1947 when Pakistan came into being with East Bengal as its eastern wing the port of Chittagong except for a wooden jetty (for warships) constructed in 1945, saw no further construction of jetties. However, the port made a slow but steady progress.

With the creation of Pakistan, Chittagong with its half-a-century old "4½ Jetties"[48] was called upon to cope with the sea-borne trade of the new province of East Pakistan. Being the only gateway at that time through which all the traffic to and from East Pakistan had to pass, the port developed by leaps and bounds and more than 15 crores of rupees have been invested since then in the development of the port of Chittagong. Although the creation of Chalna Anchorage in 1950-51 has deprived Chittagong port of the exclusive monopoly of East Pakistan's overseas trade, Chittagong still remains the chief overseas port of East Pakistan and is likely to continue to enjoy this status for a number of years to come. Historical momentum dies but slowly.

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[47] *Ibid*, p. 5.

[48] M. A. Barry, *Monthly Bulletin of the Port of Chittagong* (February, 1960), p. 3.

EVOLUTION OF THE SAHIWAL DISTRICT[1]

A CASE IN HISTORICAL GEOGRAPHY

AZIZ-UR-RAHMAN MIAN

There is no little provincial state which has not had its germinal, its geographical starting point; there is no durable political formation in whose origin we cannot discover a combination of forces, a kind of armature around which other territories could build themselves up like the soft parts round the bones of a skeleton[2].

ALL states are divided for purposes of internal administration into smaller unit areas. In most countries, they form a hierarchy with gradually increasing complexity of functions and responsibilities. A study of evolution of such boundaries is of direct interest to geographers as it helps in understanding their spatial characteristics and their patterns in a given state.

Pakistan is also divided into many administrative sub-divisions. The hierarchy of the administrative set up starts from the province and goes down to the level of district and *tehsil* (sub-division of district.) These are products of the British rule in Pakindian sub-continent.[3] Of all these, district forms the base of the whole administrative set up and is considered to be the most important one.[4]

Sahiwal district became a regularly administered area in 1849, when the Britishers took over the country. Before their arrival, the area was plagued with anarchy and feudalism. Feudal lords had become self-styled leaders and rulers of as much area as they could lay their hands upon. There was great instability in the boundaries of administrative areas as well as their administration. But after Ranjit Singh, a powerful Sikh ruler, conquered Panjab, stability, both in boundaries and internal administration of the sub-divisions of the area, was somewhat restored.

[1]Prior to 15th November, 1966—Sahiwal District was known as Montgomery District. It was renamed at the time when centenary anniversary of the District was celebrated.

[2]L. Febvere, *A Geographical Introduction to History* (London: Kegan Paul, Trench, Trubner and Co. 1938), p. 310.

[3]Pakindian sub-continent' stands for Pakistan—Indian Sub-continent.

[4]G.N. Joshi, *Indian Administration* (London : Macmillan and Co., 1938), pp. 215—217.

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Before Sikh rulers, the area remained under complete control of Moghul emperors. Before Moghul rule, the history of the area is obscure and only a vague idea can be had about the possible extent and administrative set up of the area under study.

In the proto-historic era,[5] Harappa was the centre of a developed culture, the extent of which was much more than the present day Sahiwal district. From that period down to the present time the administration of the area has been controlled from different centres located in the present Sahiwal district. The boundaries of political areas around these 'cores' were defined in accordance with political, economic and administrative needs of the time. It is around this theme that the objective of the present paper has been developed.

The purpose of this study is, therefore, to examine the politico-historical processes which have led to the evolution of Sahiwal as a district.

The changing location of political centres in various periods forms an interesting historical feature in this district; and this situation can be gainfully employed in achieving the objective of this study. It is evident that the study would involve delving deep into the history of the district and adjoining areas. A wide variety of literature including books, biographies, historical accounts, settlement reports and other relevant materials about the district have been consulted. Archaeological information and circumstantial evidences, scanty as they may be, provide some clues to demarcating the spatial extent of Harappa Culture—the base of the study.

Harappa Core

The area comprising Sahiwal district was part of an advanced civilization known as Indus Valley Civilization, which extended over a large area. A lot of research has been done on Indus Valley Civilization, but most of these works are important only from archaeological point of view. Very few works give clue to the possible extent of the civilization. To draw any boundary line for showing the extent of the Indus Civilization, it is convenient to begin from the two 'cores', one at Mohenjodaro and the other at Harappa.[6] In Piggott's opinion, the entire area falling within the extent of Indus Valley Civilization was governed from these two cores and, thus, there were two provinces. The possible boundary line separating the two provinces lay somewhere below the confluence of river Indus

[5]'Proto-historic era' is often confused with the 'Pre-historic era'. Pre-historic era is about which nothing is known whereas Proto-historic era is that about which certain script has been found but has not been deciphered so far. Harappan Culture belongs to the latter.

[6]S. Piggott, *Pre-historic India* (London : Pelican Series, 1961), P. 150.

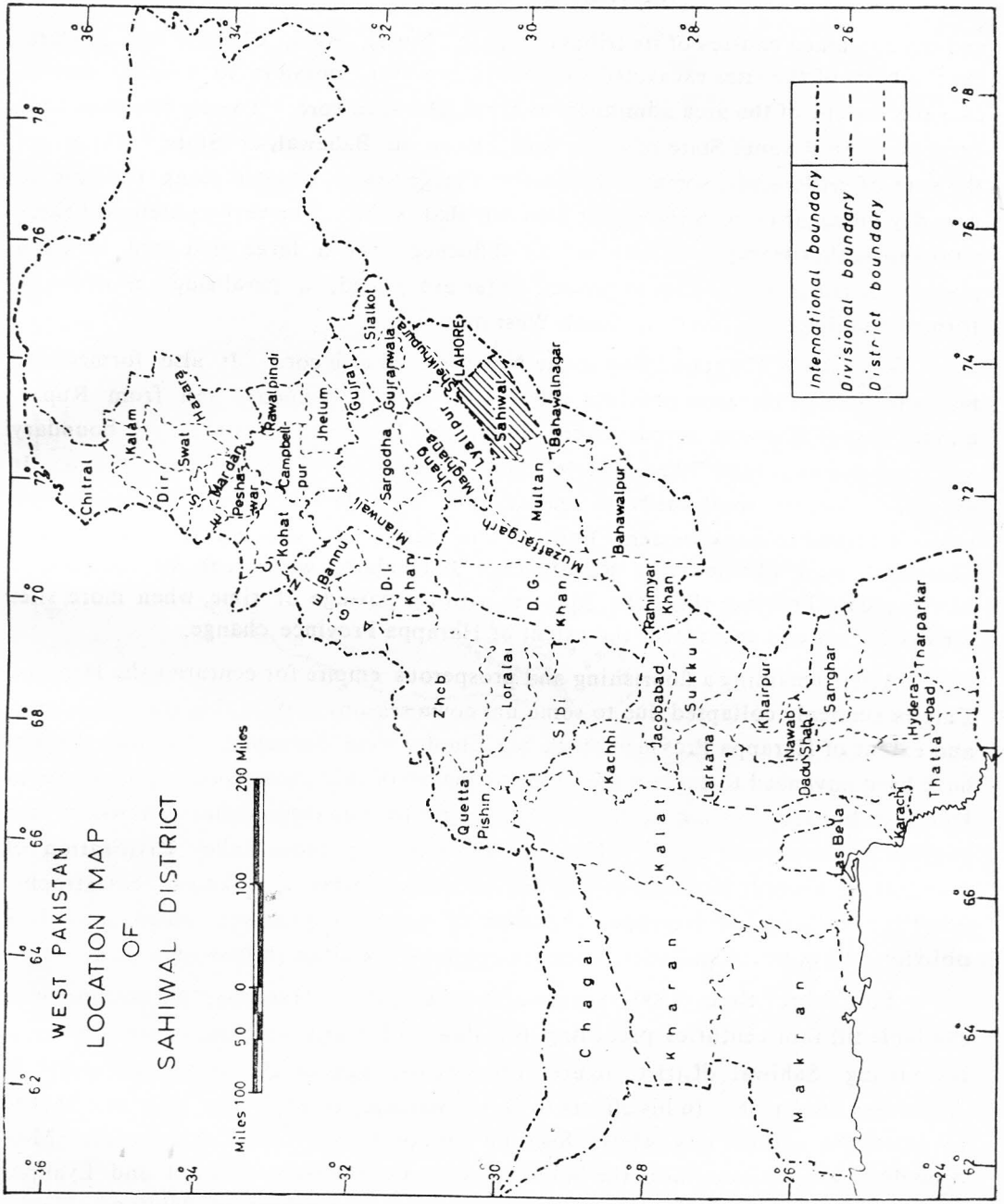
WEST PAKISTAN
LOCATION MAP
OF
SAHIWAL DISTRICT
Miles 100 50 0 100 200 Miles
International boundary
Divisional boundary
District boundary
Chitral
Kalam
Dir
Swat
Kohistan
Mansehra
Peshawar
Kohat
Campbellpur
Rawalpindi
Jhelum
Gujrat
Sialkot
Gujranwala
Sheikhupura
LAHORE
Lyallpur
Sahiwal
Bahawalnagar
Multan
Bahawalpur
Muzaffargarh
Mianwali
Sargodha
Jhang
Bannu
D.I. Khan
D.G. Khan
Rahimyar Khan
Zhob
Loralai
Sibi
Quetta
Pishin
Kachhi
Jacobabad
Sukkur
Khairpur
Nawabshah
Sanghar
Larkana
Kalat
Chagai
Kharan
Makran
Las Bela
Karachi
Hydera-bad
Thatta
Tharparkar

FIGURE 1

and the combined courses of its tributaries, viz., Sutlej, Ravi, Chenab and Jhelum. On the basis of the sites excavated so far it is, however, possible to roughly demarcate the extent of the area administered from Harappa core. Twenty five sites have been found in Bikaner State of India and eleven in Bahawalpur State. These are the sites of settlements, some are evidently of large towns, situated along the line of now dry Ghaggar river in the desert area of that state. The very existence of these sites shows that Harappa culture had its influence over a large area and far-flung places. If the points of sites excavated so far are joined, a parallelogram would be formed running from North to South-West direction.

The city of Harappa lying in the North served as a core. It also formed the northern limit of Harappa province whereas the eastern boundary ran from Rupar, a place east of Harappa across rivers Sutlej and Beas; and from there the boundary extended downwards in Bikaner State where a cluster of sites has been found. It extended further southwards to Bahawalpur State in south-west direction from where it turned to mark western limit of the area. No site has been found and excavated west of the river Ravi except Judejodaro, which can be included in Mohenjodaro Province (Fig. 2). May be, with the passage of time, when more sites are discovered and excavated, the extent of Harappa Province change.

After remaining a flourishing and prosperous empire for centuries the Harappa Empire suddenly collapsed due to some unknown reasons. With this the boundaries and extent of Harappa Province of the big Empire were disturbed. Various theories have been advanced to explain the sudden collapse of this civilization with centre at Harappa, but they can not be discussed at length here as they do not fall within the purview of the present article. However, the imposing Indus Valley Civilization of Harappa, as a whole perished utterly due to some, hitherto, unknown catastrophe. After the collapse of Harappa, the core of northern province lapsed into dark oblivion and political and administrative centre of activities shifted somewhere else.[7]

For more than 2500 years after the fall of Harappa, no testimony is available till four centuries preceding the dawn of Christian Era, when the area, eomprising Sahiwal district, figure, prominently against the victorious army of Alexander the Great. In his efforts to secure passage through the district, he had to assault a walled city whose location cannot be correctly determined. Most probably, it was located near the boundary separating present Sahiwal and Lyallpur districts at a distance of eighty to ninety miles North-East of Multan. Maulvi Mohammad Jamil-ur-Rehman after doing quite a bit of research and referring to the old and renowned historians and geographers like Strabo and Beel has arrived at the conclusion that the above mentioned town, which seems to be the core of the area

[7]Hamid Qureshi, "Montgomery Through the Ages", *Montgomery District Souvenir* (Montgomery : Assistant Director, Basir Democracies, 1965), P. 52.

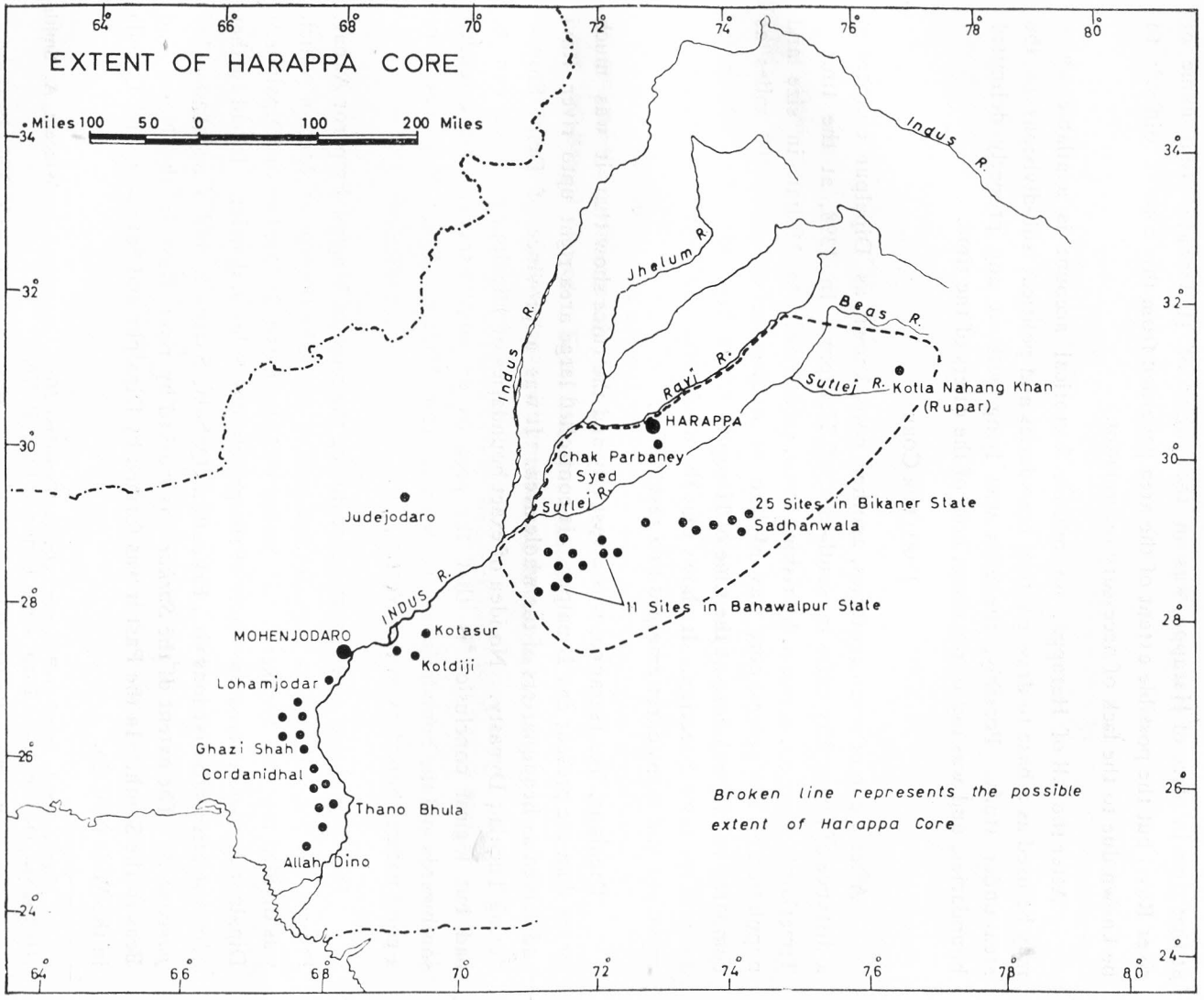
EXTENT OF HARAPPA CORE
Miles 100 50 0 100 200 Miles
Indus R.
Jhelum R.
Beas R.
Ravi R.
Sutlej R.
Kotla Nahang Khan (Rupar)
HARAPPA
Chak Parbaney Syed
Judejodaro
25 Sites in Bikaner State
Sadhanwala
11 Sites in Bahawalpur State
MOHENJODARO
Kotasur
Kotdiji
Lohamjodar
Ghazi Shah
Cordanidhal
Thano Bhula
Allah Dino
Broken line represents the possible extent of Harappa Core

FIGURE 2

at that time in place of Harappa, was in the valley of Hyderwatis[8] (old name of river Ravi) but the possible extent of the area governed from this core is difficult to be known due to the lack of necessary information.

After the fall of Harappa, no reliable historical account is available which may be used as a base to draw political boundaries and political sub-divisions of the area under study. Possibly, the area was lying without any properly delimited boundaries, and was out of the direct hold of the rulers of the time.

Dipalpur Core

After a gap of seven centuries, another core, known as Dipalpur emerged at a distance of about fifty miles in south-east of Harappa. In 1398, at the time of Timerlain's invasion, it was a flourishing town, second only to Multan in size and population.[9] The nearest core was Multan at a distance of about 100 miles as compared to Mohenjodaro at the time of Harappa which lay more than 400 miles away in the same direction. It shows that the whole area now began to be politically organized and many cores emerged as a result of it.

Dipalpur, like Harappa, was a vast city and the ruins show that it was much larger than the present day Dipalpur. It controlled large area right upto river Ravi and served as headquarters of the whole area. It was a province of Delhi Empire during Tughlaq Dynasty. No idea of exact boundaries of Dipalpur province can be had but logical conclusion is that the area as an administrative unit extended southwards and the boundaries lay somewhere near Multan. River Ravi could be a good natural boundary in the West.

Dipalpur gained more prominence during the reign of Moghul Emperor Akbar. Present day Sahiwal, at that time, formed part of the *Suba* (Province) Multan which was divided into two *Sarkars*[10]. 1) *Sarkar* of Multan and 2) *Sarkar* of Dipalpur.[11] Dipalpur *Sarkar* covered the whole of the present day Sahiwal district. It had further administrative sub-divisions viz., Pakpattan, Qabula, Satghara and Faridabad called *parganas*.[12] The extent of the *Sarkar* was marked by river Ravi in the North and Beas in the South. In the East it was formed by Dipalpur and Satghara and Qabula in the West (Fig. 3).

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[8]Mohammad Jamil-ur-Rehman, *Qadim Tareekh-i-Hind*, translated by Wincent A. Smith (Hyderabad, Deccan, Darul Taka, Jamia Usmania, 1922). P. 126.

[9]F. C. Bourne, *Punjab District Gazetteers, Montgomery District*, Vol. 18 (Lahore : Government Printing Press, 1933), p. 31.

[10]*Sarkar* was a sub-division for administrative purpose and was almost equal to present day district.

[11]Abul Fazal, Allami, *Ain-i-Akbari*, translated by J.S. Garrette (Calcutta : Royal Asiatic Society of Bengal, 1938), P. 310.

[12]*Pargana* was further sub-division of *Sarkar* and was almost equal to present day *tehsil*.

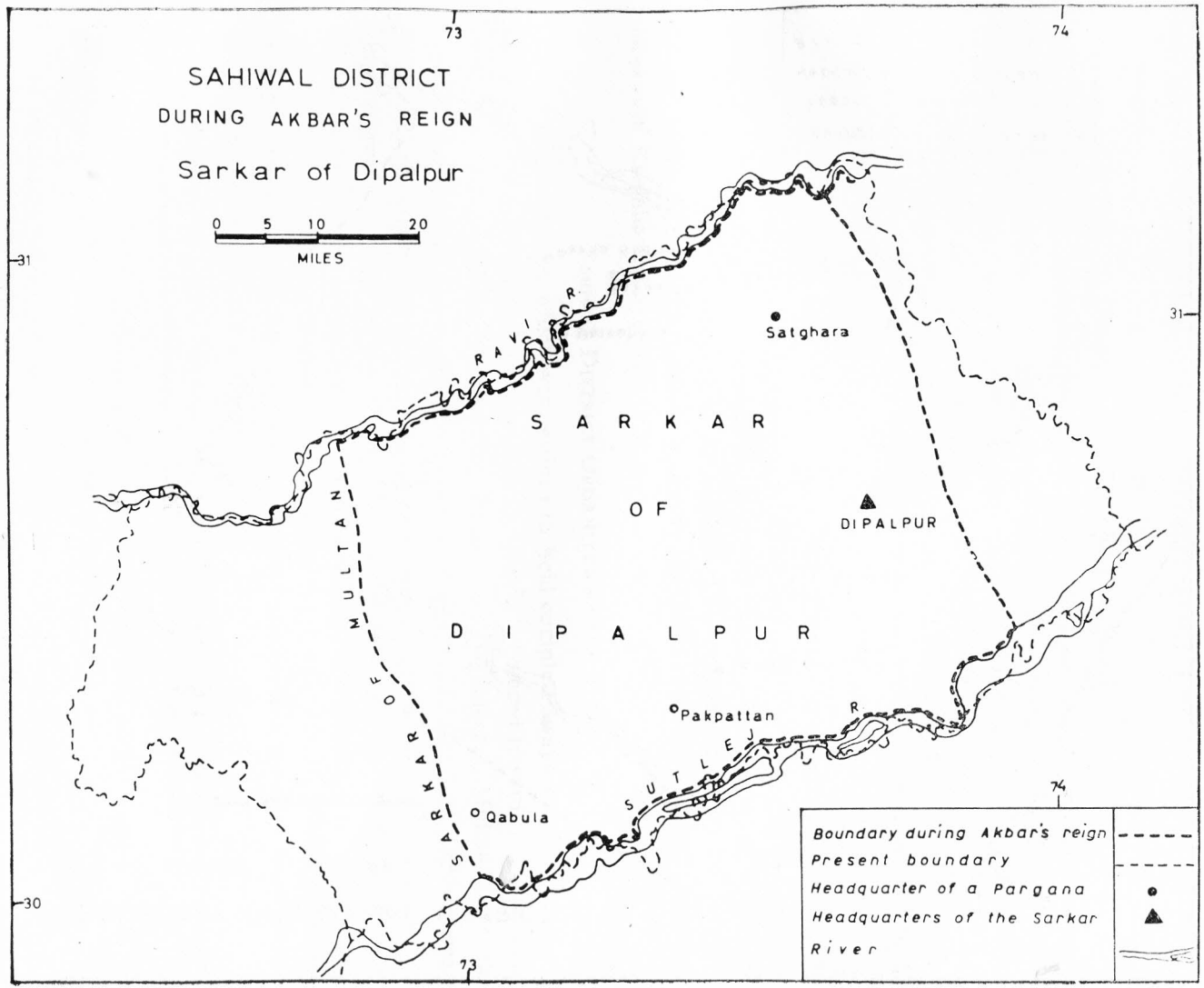
SAHIWAL DISTRICT
DURING AKBAR'S REIGN
Sarkar of Dipalpur
0 5 10 20
MILES
73
74
31
30
RAVI R.
Satghara
SARKAR
OF
DIPALPUR
DIPALPUR
MULTAN
SARKAR OF
Pakpattan
SUTLEJ R.
Qabula
Boundary during Akbar's reign
Present boundary
Headquarter of a Pargana
Headquarters of the Sarkar
River

FIGURE 3

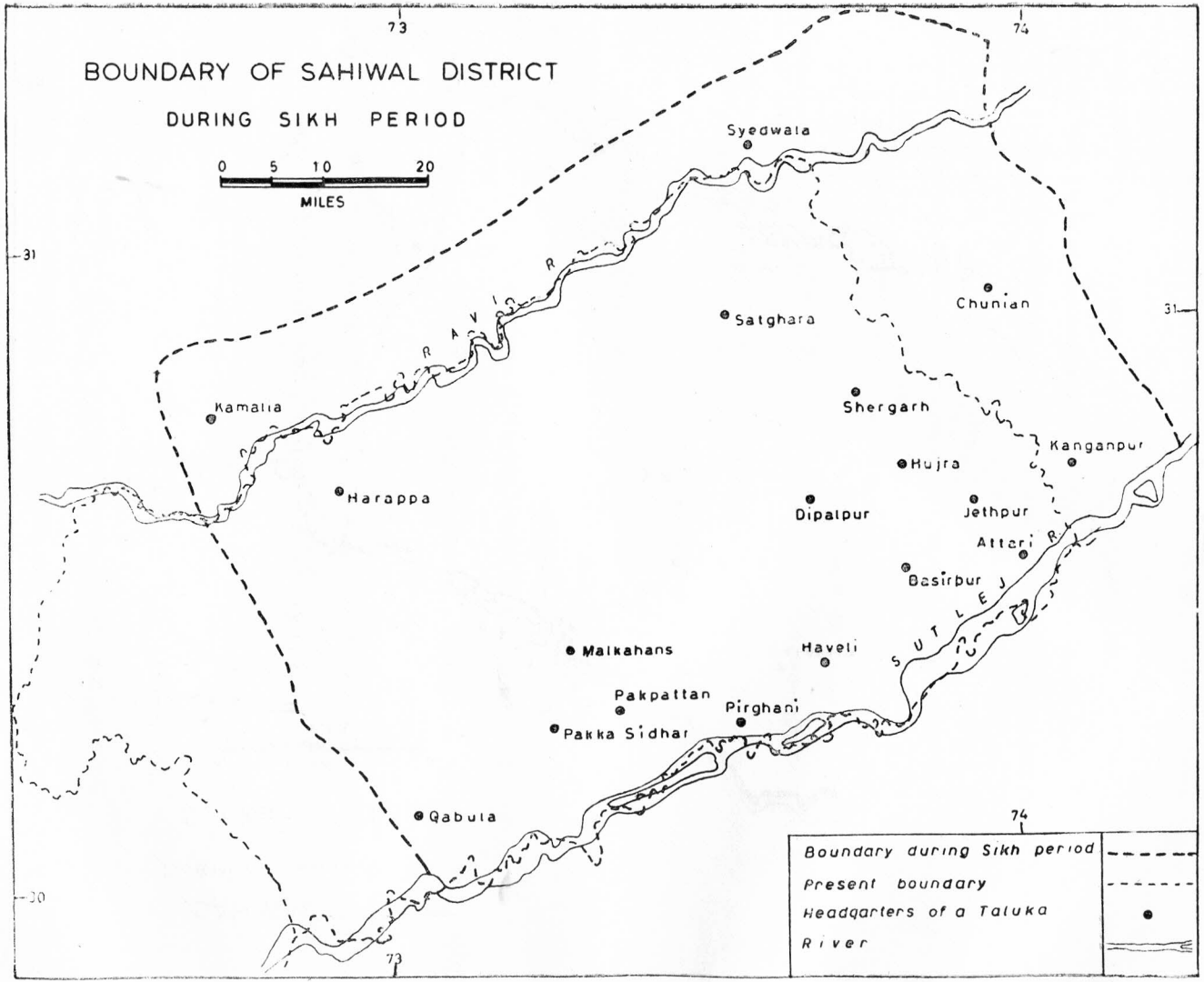
BOUNDARY OF SAHIWAL DISTRICT
DURING SIKH PERIOD
0 5 10 20
MILES
73
74
31
30
Syedwala
Satghara
Chunian
Kamalia
Shergarh
Kanganpur
Hujra
Harappa
Dipalpur
Jethpur
Attari
Basirpur
Malkahans
Haveli
Pakpattan
Pirghani
Pakka Sidhar
Qabula
RAVI R.
SUTLEJ R.
Boundary during Sikh period
Present boundary
Headquarters of a Taluka
River

FIGURE 4

The boundaries as well as the administrative and political organization of the area were so stable that after Akbar his followers did not think it necessary to effect a change in it.

Phase of Anarchy and Feudalism

With the fall of central authority of Delhi, which was the seat of Government of Moghul Emperors, the area under study passed into a phase of anarchy. Feudal lords became rulers of as much area as they could lay their hands upon. In this way the area fell in each hand in undefinable chunks. The period of anarchy and feudalism can be divided into two distinct sections 1) reign of feudal lords 2) reign of Maharaja Ranjit Singh.[13] In both the cases, the area was sub-divided into a number of *talukas*.[14]

An overall survey shows that the area was divided into eleven *talukas*, each having a number of villages and ruled by a feudal lord, but when Maharaja Ranjit Singh rose to power and consolidated his hold over whole of the area in 1801, he quickly sub-divided the area into fifteen *talukas*, The Southern boundary was formed by river Sutlej whereas the northern boundary lay across the river Ravi and included *talukas* of Kamalia and Syedwala (Fig. 4).

Sahiwal District Organized by the British

The British rule, which was destined to hold complete sway over the whole of Pakindian sub-continent for about a century, slowly advanced towards the northern parts of the sub-continent. In 1847, the British army conquered Multan and with this, fell the whole of Sahiwal area. This was the dawn of British rule in the area. Soon after the occupation of the area, the Britishers proceeded to organise the newly acquired vast territories north of river Sutlej. It was soon clear to the British administrators that if proper, well controlled and safe government was to function with a substantial degree of autonomy, including legal and actual powers to raise, at least a part of the revenue, the sub-division of province into districts was inevitable.[15] To put it in Zaidi's words :

"British Administrative system was designed to suit the colonial government, mainly engaged in collection of revenue, administration of justice, and maintenance of law and order."[16]

In this way the districts were the most important administrative units in overall structure of British administration in India.[17]

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[13]Bakhtawar Lal, *Tareekh-i-Zillah Montgomery* (Amritsar : Amritsar Press, 1869), P. 5.

[14]*Pargana* of Moghul period was known as *taluka* during Sikh period.

[15]I.H. Zaidi, *Administrative Areas of West Pakistan; A Geographical Evaluation* (Syracuse: 1961) unpublished Ph. D. dissertation, P. 103.

[16]*Ibid.*

[17]Joshi, *op. cit.*, P. 215—17.

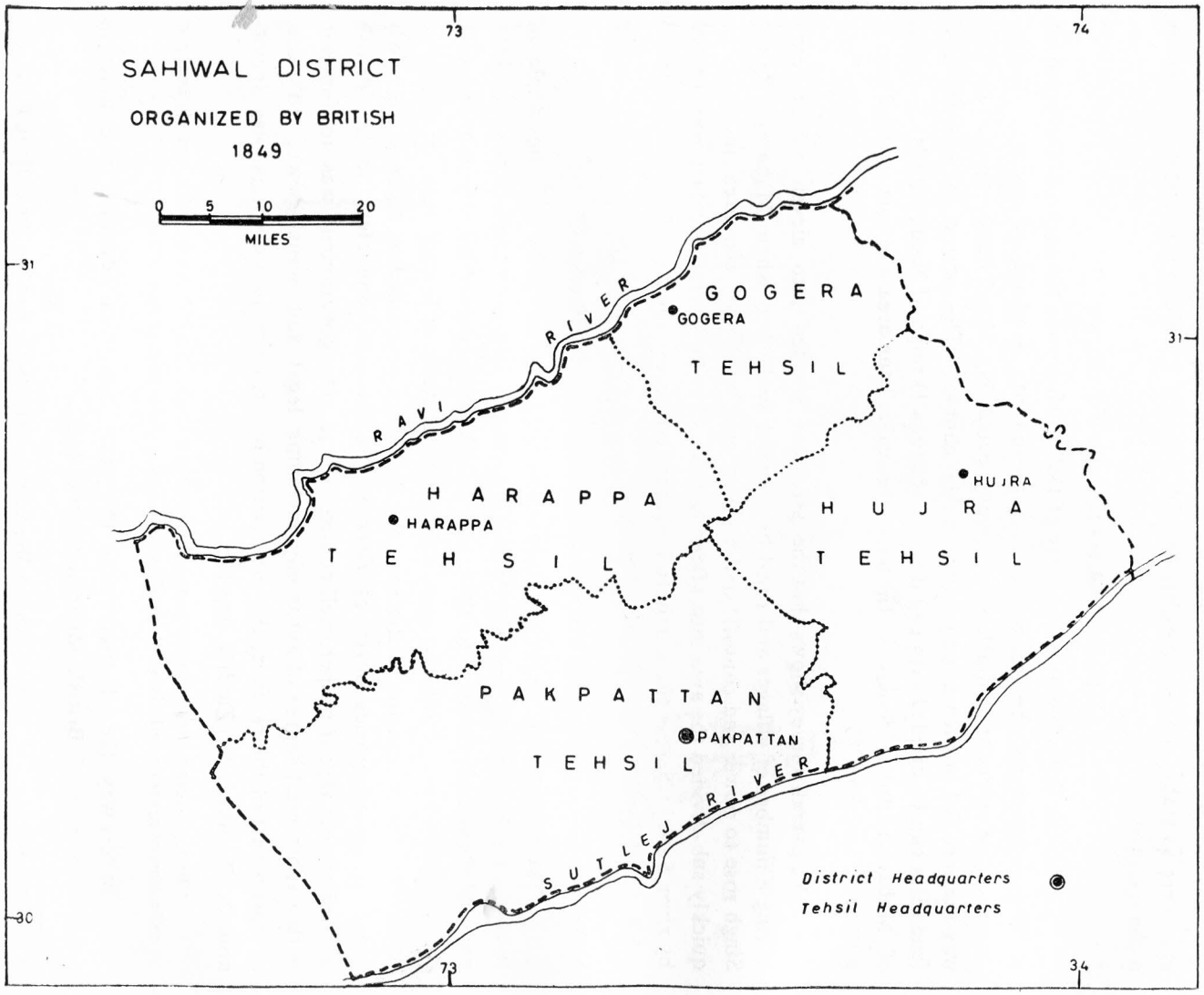
SAHIWAL DISTRICT
ORGANIZED BY BRITISH
1849
0 5 10 20
MILES
73
74
31
30
34
RAVI RIVER
GOGERA
GOGERA TEHSIL
HARAPPA
HARAPPA TEHSIL
HUJRA
HUJRA TEHSIL
PAKPATTAN
PAKPATTAN TEHSIL
SUTLEJ RIVER
District Headquarters
Tehsil Headquarters

FIGURE 5

Pakpattan enjoys the unique privilege of being named as the first headquarters of the newly occupied and organized district of Sahiwal by the Britishers. At that time, it was a very small town. They organized the district in 1851 and included so much of the present district as lies between Ravi and Sutlej. The trans-Ravian portion belonged to Jhang district and trans-Sutlej area to Bahawalpur State.[18]

The Eastern boundary ran from Banga Amir Singh in the south-east corner of the district about four miles east of Attari, a *taluka* during Sikh period. From here, the boundary line extended northwards zig-zagging upto river Ravi. In the West boundary running from river Ravi to river Sutlej was relatively straight (Fig. 5).

Rivers Ravi and Sutlej have in one way or the other formed the boundary of the area under study for centuries as Jones observes, "this kind of natural boundary has been in use for millinia in other regions as well before there arose a doctrine about it".[19] When the Britishers proceeded to organize the district they found the old bed of river Beas lying almost in the middle of the district and running parallel to its whole length. So it was used to demarcate the boundaries separating *tahsils*. In 1852, the trans-Ravian portion belonging to Sheikhupura and Jhang districts (now Lyallpur) was added to the district. With the revision of the boundaries, the location of newly organized headquarters was also considered. It seems that the headquarters station, the core, was never meant to be permanent, as no building to house the staff running the administration was built.

With the addition of trans-Ravian area, the administrative core of the district was shifted from Pakpattan to a more centrally located place known as Gogera. Due to this change, the district was also christined as Gogera.

With the shifting of core to Gogera, the boundary between Lahore and Gogera district was readjusted. Twenty-two villages were made over to Gogera district purely due to administrative reasons.

Shift of Core to Sahiwal

The year of 1857 saw the rise of the tide of nationalism in Pakindian sub-continent. Gogera district was no exception. It had a very important effect on the administrative set up of the district. One positive result of the uprising was that the British officers felt and realised the necessity of linking the core with the outer world by quick means of transportation. Railways were quickly introduced in the

[18]Bourne, *op. cit.*, P. 44.

[19]Stephen B. Jones, "Ideas about Boundaries in the Setting of Place and Time". *Annals*, Association of American Geographers, Vol. 59 (1959), P. 248.

Panjab and various towns and cities like Multan and Lahore were connected. This development left the district headquarters bypassed by the railway lines by about ten miles. It was conceived by the administration that they could not function properly at Gogera with the communicational difficulties being faced after the arrival of railways. Thus, it was strategic as well as administrative consideration which persuaded the British authorities to abandon Gogera and shift to Sahiwal.[20] The headquarters lay almost equi-distant from Multan and Lahore.

The change of core was quickly followed by changes in the administrative set up of the district in so far as Harappa ceased to be a *tehsil* headquarters. It was situated only at a distance of twelve miles from the new district headquarters which was also made the *tehsil* headquarters. In this way, Harappa became superfluous. Subsequently, the headquarters of Hujra *tehsil* was shifted to Dipalpur, the more centrally located place. Although the shifting of core necessitated the recasting of internal set up of the district, it did not affect the district boundary, but later on, rapid development in the colonization of the district effected large scale transfer of villages from one *tehsil* to other thus changing the boundaries both at *tehsil* and district levels (Fig. 6).

Removal of Trans Ravian Area

Since 1901, the district boundaries have undergone considerable changes. These changes have either been brought about by creation of districts composed of parts of other surrounding districts or by transfer of one or more than one *tehsils* from one district to the other. As the time wore on, it became eminently clear to the authorities that their control and supervision over the trans-Ravian area comprising old Syedwala *tehsil* and now amalgamated into the adjoining *tehsils* were arduous if not impossible. Ultimately, Sahiwal district (then known as Montgomery district) had to forego its entire area across river Ravi in favour of a newly created district known as Lyallpur which emerged on the map of the Panjab Province after surrendering similar uncontrolable yet adjacent areas of Jhang, Sahiwal and Gujranwala districts. To quote Zaidi *in extensio* :

"The rationale behind such changes may be attributed to the administrative conveniences. It can be expected that increasing facilities of canal irrigation and transportation in West Pakistan which started and developed considerably during the British period, would lead to the considerable increase in the population of certain district which thereby became unmanageable from the point of view of conveniences. For example the creation of Lyallpur district was necessitated by Chenab Colony which is the natural development of irrigation facilities."[21]

[20]Sahiwal at that time was a small village and was inhabited by 'Sahu tribe', hence the name. It was renamed as Montgomery in 1865 by way of a compliment to Sir Robert Montgomery who was then Lieutenant Governor of the Panjab Province.

[21]Zaidi, *op. cit.*, P. 113.

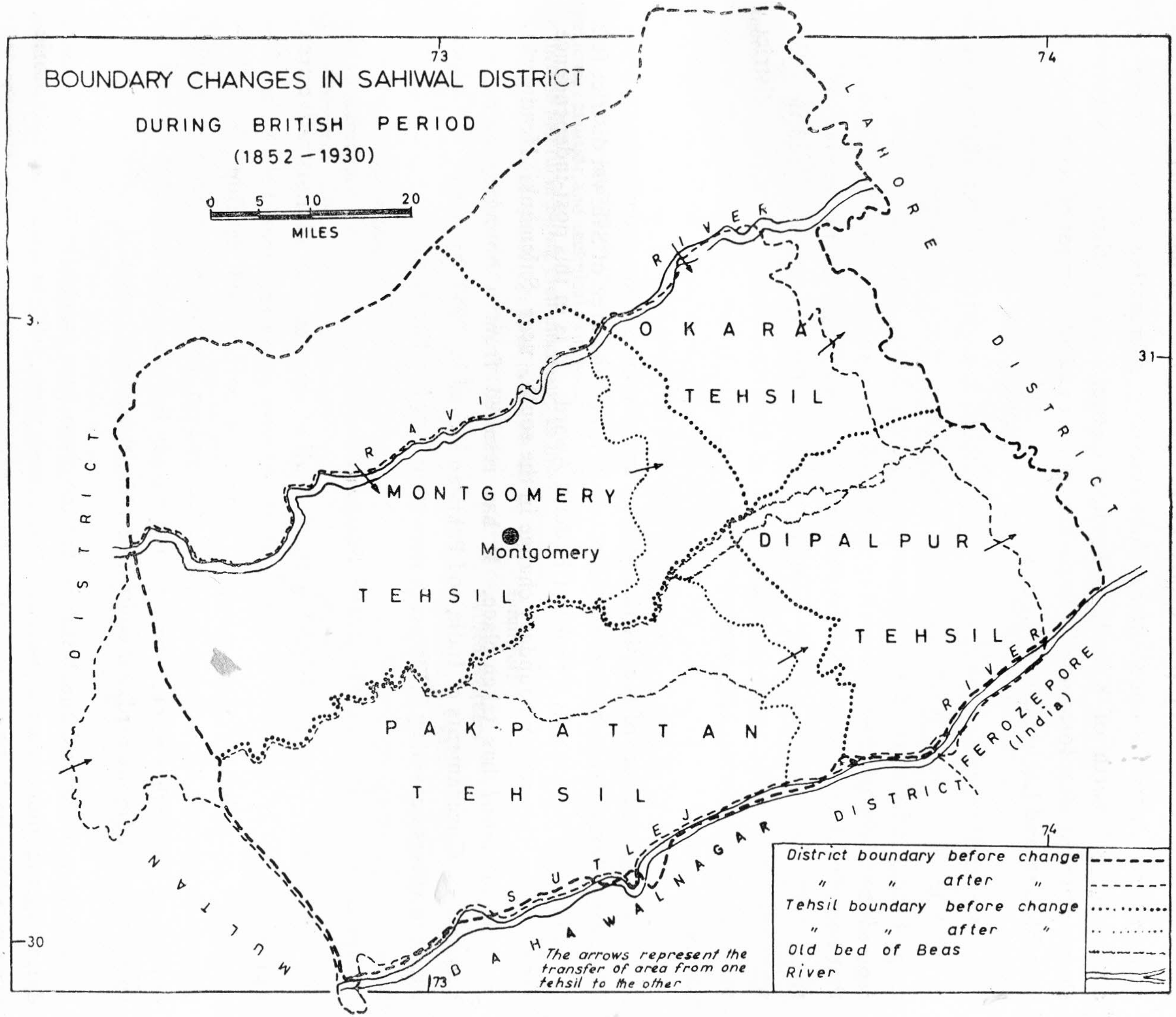
BOUNDARY CHANGES IN SAHIWAL DISTRICT
DURING BRITISH PERIOD
(1852 – 1930)
0 5 10 20
MILES
73
74
31
30
LAHORE DISTRICT
RAVI RIVER
OKARA TEHSIL
MONTGOMERY TEHSIL
Montgomery
DIPALPUR TEHSIL
PAKPATTAN TEHSIL
SUTLEJ RIVER
FEROZEPORE (India)
BAHAWALNAGAR DISTRICT
MULTAN DISTRICT
The arrows represent the transfer of area from one tehsil to the other
District boundary before change
" " after "
Tehsil boundary before change
" " after "
Old bed of Beas
River

FIGURE 6

It is worth noting that whole of the added area was not transferred to the newly formed district at once. It was done gradually, culminating in the transfer of a block of land north of Kamalia to Lyallpur district. So the district in its present shape, emerged after foregoing its trans-Ravian area and adjustment of its boundaries with Multan and Lahore districts.

Generally speaking the northern and southern boundaries of the district run parallel to the rivers Ravi and Sutlej respectively. But a close observation of the map of the district shows that the boundaries in the South have, at certain places crossed the river in the neighbouring district of Bahawalnagar. It is due to the fact that boundaries have not followed the meandering and changes in the course of the river. On the other hand, the northern boundary of the district was fixed in 1930 when the whole of the area lying across the river Ravi was detached from the district to form the new district of Lyallpur. So this boundary is definitely younger than the one in the south.

The boundaries of the district without any changes, whatsoever, continued till 1947, when Pakistan was born as a Muslim country, and the area of Sahiwal district fell to the share of Pakistan as a result of Redcliff Award. It is in this post-independence period that a very minor boundary change in the south, near Sulemanki Headworks in Dipalpur *tehsil* has taken place. It has resulted from a boundary agreement between the Governments of India and Pakistan signed in 1960 by virtue of which fourteen villages covering 7,136 acres were transferred to Pakistan.

Summary

Few districts have seen such a rise and fall of empires as an administrative area as the district of Sahiwal. A glance at the history of the area would show that the cores have been shifting from place to place. A core would develop, and after sometimes, would lapse into insignificance and in its place another core would develop at some other place. The area under study has always been, except for a short span of time, administered and controlled from these focal points.

The main general conclusion is that the rivers have served the purpose of boundaries in the olden days as well as in the present time. Right from 'pro'to-historic era rivers have been chosen to mark the extent of the area for the purpose of administration. During Moghul and Sikh periods, Sutlej and Ravi rivers have formed the Northern and Southern boundaries. When the British rule came in the district, British administration did not only choose rivers (Ravi and Sutlej) for demarcating the district boundaries but the *tehsil* boundaries were also defined along the old bed of river Beas.

RATING THE EFFICIENCY OF FACTORY WORKERS : THE CASE OF LYALLPUR CITY

How efficient are the factory workers at an industrial centre? This is an important question, particularly in the context of the developing countries like Pakistan where there are wide differences in experience, attitude and technical skill of the labour force available at various industrial centres. The question falls within the province of a cultural geographer.

A case study of the factory workers at Lyallpur is being presented. What is aimed at is to analyse the characteristics of the labour force with a view to gaining knowledge of their experience, attitude and technical skill which would in turn be helpful in rating their efficiency. In this manner the uniqueness of Lyallpur in terms of labour force characteristics will be revealed. Similar analyses of the workers at other centers would be useful for the purposes of classification and comparison.

The industrial centre of Lyallpur has been rated in accordance with each of the measures, viz, experience, attitude and technical skill. Average of the grades thus assigned provides the efficiency index. The grades have been intutively assigned after careful thought, and are relative to the characteristics of labour force in Karachi which has been rated as 'A'[1], the standard for the present analysis.

Data have been collected by direct interviews with the factory workers. A total of 600 workers in different industries, like textile, leather, food, wood products, printing and publishing, chemicals, high engineering, plastic, etc, represents only one per cent of the labour force of the city, yet, as all types of workers in all kinds of industries in Lyallpur have been covered by this survey, it is hoped that the results would be satisfactory. The percentage of different category of workers varies and the largest size of workers interviewed are the ones classed as skilled[2] who happen to form the largest group (Table 1).

TABLE 1—CATEGORIES OF WORKERS AND THEIR PERCENTAGE INTERVIEWED

Category	Percent
Engineers	10
Skilled Workers	70
Unskilled Workers	16
Office Clerks	4

Source : Data collected by the Author

EXPERIENCE OF THE WORKERS

Experience has been defined as that skill of the workers which has been acquired as a traditional heritage either from forefathers or from the society. In view of this definition place of origin, family background of the factory workers and the method of their recruitment have been selected as indicators of experience.

Place of Origin

The bulk of the Lyallpur population consists of those who migrated from rural areas of India have been interviewed. Although this sample

[1] This estimate is based on a useful study by G. Rains, *Industrial Efficiency and Economic Growth* (Karachi : Institute of Development Economics, 1961)

[2] Category of skilled workers includes all those workers who are doing such duties as require some practice and skill.

as a direct result of partition (Table 2). Thus an urbanized population or those having some industrial experience does not form the major source of labour supply to the newly established factories. Majority of the labour force is rural in origin. This results into less efficiency of Lyallpur labour force as compared to Karachi where situation is just the reverse *i.e.* the majority of the workers is urban, as is revealed by an industrial survey of Karachi. [3]

TABLE 2—ORIGIN OF LYALLPUR WORKERS

	Place	Born	Initially Employed
I	Urban Areas	40	80
	Lyallpur	4	50
	Urban Pakistan	10	15
	Urban India	25	14
	Foreign	1	1
II	Rural Areas	60	10
	Rural Pakistan	20	7
	Rural India	40	3

Source : Data collected by the Author

Besides, the migration from rural areas, within Pakistan, to urban places has become a significant feature associated with industrialization. About 80.1 per cent of the ordinary labourers in Lyallpur are rural in origin; seventy per cent of them have permanently settled in the city, whereas the remaining ones commute daily from the nearby villages. Transportation facilities, small agricultural holdings and large families along with the attractions of a city life may be regarded as main reasons for this situation of rural-urban migration.

In view of the findings that the bulk of the factory workers in Lyallpur comes from rural areas it may be inferred that in terms of their experience the workers in Lyallpur are inferior.

Family Background

In what kind of occupation were the forefathers of a person engaged? What is his parent's choice? These are the questions which are directed to investigate something of the taste and skill of a person for a particular job. A farmer's son would be expected to have a better skill for farming. Family background, therefore, serves as good yardstick for estimating the experience of the factory workers in Lyallpur.

It has been found, however, that excepting the skilled workers, in most cases the workers in Lyallpur are from the families of agriculturists, businessmen or government servants (Table 3). The skilled workers do show a tendency of following the same occupation as of their fathers and forefathers. The bulk of the unskilled workers is composed of the sons and grandsons of the agriculturists. This trend does point towards changes in occupational structure associated with industrialization, but it reduces the efficiency of workers as well.

TABLE 3—FAMILY BACKGROUND OF LYALLPUR WORKERS
(Per cent in each category of occupation)

Workers Occupation	Engineers		Skilled workers		Unskilled workers		Office clerk	
Father's and Grandfather Occupation	Father/Grand-father		Father/Grand-father		Father/Grand-father		Father/Grand-father	
1. Engineers	2	3	1	1	—	—	—	—
2. Skilled workers	8	13	22	25	6	12	9	—
3. Unskilled workers	—	—	6	9	6	12	—	—
4. Private services	3	4	5	4	4	7	—	17
5. Industrialists	1	6	6	7	2	2	—	—
6. Businessmen	34	44	20	17	12	16	45	33
7. Professional people	2	4	2	3	4	2	—	—
8. Government Service	10	9	11	15	11	16	9	33
9. Agriculturalists	40	21	28	13	49	25	27	8
10. Service workers	—	—	1	2	9	7	9	8
	100	100	100	100	100	100	100	100

Source : Data collected by the Author

[3] G. Rains, *op. cit.*

Method of Recruitment

Another important index to the experience of the workers in Lyallpur is the procedure that is followed in their employment. Some are appointed on the basis of personal contacts whereas others are recommended by relations, friends or important government officers or former employees. Other methods of employment that are practised are advertisement or through employment exchange. None of these methods can be considered to be fcolproof. However, it is generally assumed by the employers that direct contacts and recommendations work as better ways of insuring loyality and efficiency of the employee. About eighty per cent of the employers in Lyallpur factories give preference to direct contact and recommendations of fellow workers and relations (Table 4). Advertisement and employment exchange play very insignificant role.

TABLE 4—METHOD OF RECRUITMENT

Method of Employment	Percent workers according to Employer's) response	Percent workers according to Employee's responses
Direct Contact	45	35
Recommended by fellows, relations, and friends	33	43
Family relations	10	12
Locality preferences	4	1
Advertisement	2	—
Employment-Exchange	3	1
Recommended by the previous employers	1	4
Other means	2	4
	100	100

Source : Data collected by the Author

Thus, it becomes clear that the method by which the workers in various factories are generally hired insure efficiency.

The over all grade in terms of experience may be as 'c'.

ATTITUDE OF WORKERS

Attitude of workers is an important indicator of their efficiency. How to measure attitude of the workers? This is a difficult question. No method can be entirely satisfactory. For the present purpose job aspiration, wage structure and security of job have been used as convenient measures. Each of them is discussed in the following sections.

Job Aspiration

It is natural that when a person gets a job that he aspires for, he feels not only satisfied but also very much enthusiastic about it. This leads to the development of a feeling of belonging - ness which generates a healthy attitude towards the job.

In the context of the factory workers in Lyallpur it has been found that the occupational aspiration is related to economic motivation and social prestige. Most people aspire for highly placed technical or non-technical jobs. The skilled workers generally look for security and better salary grades, which are discussed in their appropriate sections. It is the unskilled workers who come directly within the scope of the present section. None of these workers wants his son or son-in-law to follow his profession and remain unskilled manual labourer. This is because they neither have sufficient income nor do they have a respectable place in the society. But, in spite of their distaste for the job as unskilled manual labourers, in most cases their off-springs follow a similar occupation. Thus a general dissatisfaction among the unskilled workers prevails.

Wage Structure

In order to create correct attitude among the workers it is necessary that the salaries of various category of workers must be not only reasonable but also comparable with those in other industries or firms. This is not the case, however, when the wage structure of Lyallpur industries is analysed. The price of labour differs from industry to industry and also within the same industry from firm to firm, depending upon the type of labour hired (Table 5). The large scale firms tdnd to pay higher wages per hour than do the small-scale ones. The average monthly wage rate for skilled and unskilled workers, both increases with the rise in the scale of operation of all the industries combined together (Table 6). This situation again leads to a very unsatisfactory attitude of the workers towards their job. They would always like to change from one firm to another.

TABLE 5—WAGE RATE PER MAN-HOUR IN RUPEES ACCORDING TO THE TYPE AND SIZE OF FACTORS

Size of Firm Industry	0—9	10—19	20—49	50—99	Over 100
1. Textile	0.50	0.52	0.62	0.70	0.80
2. Engineering	0.55	0.60	0.72	0.80	1.12
3. Plastic	0.40	0.48	0.49	0.90	0.91
4. Food	0.56	0.72	0.72	0.70	0.80
5. Leather	0 55	0.75	0.83	0.84	0.90
6. Chemical	0.40	0.45	0.60	0 65	0.98

Source : Data collected by the Author

TABLE 6—WAGE RATES OF DIFFERENT CATEGORIES OF WORKERS IN RUPEES PER MONTH ACCORDING TO THE TYPE AND SIIZE OF INDUSTRIES

Size of Industries	0—9	10—19	20—49	50—99	100 and over
Industry					
		All Workers			
1. Textile	100	120	130	150	155
2. Engineering	105	120	125	160	180
3. Chemical	120	125	130	155	200
4. Food	100	120	125	135	180
5. Leather	120	130	150	160	200
		Engineers			
1. Textile	—	—	200	250	300
2. Engineering	215	215	280	280	350
3. Chemical	150	200	2:0	250	250
4. Food	—	—	200	250	260
5. Leather	150	150	250	270	300
		Skilled Workers (Non Engineer)			
1. Textile	100	120	120	140	150
2. Engineering	110	115	130	130	200
3. Chemical	120	125	135	140	180
4. Food	100	100	110	120	150
5. Leather	120	135	135	155	200

TABLE 5—*Continued*

Size of Industries	0—9	10–19	20–49	50—99	100 and over
			Unskilled Workers		
1. Textile	50	55	70	80	95
2. Engineering	45	50	65	75	100
3. Chemical	—	43	50	65	90
4. Food	—	50	55	55	70
5. Leather	48	55	60	70	75
			Office Clerks		
1. Textile	120	125	150	150	180
2. Engineering	110	115	150	155	180
3. Chemical	100	120	125	150	200
4. Food	120	125	150	150	210
5. Leather	95	100	110	120	150

Source : Data collected by the Author

Security of job

About one-thirds of the industrial labour surveyed has been found to be temporarily employed. This is partly because of the fact that most of the employers like to save the extra expenditure on the welfare of the labour. Secondly the employers want to shift the burden of seasonal uncertainty on the workers themselves. Again there prevails unsatisfactory conditions which cannot be regarded conducive to correct attitude on the part of the workers.

The attitude of the factory workers, thus may be graded as :

Skilled workers ... ... B

Unskilled workers... ... C

TECHNICAL SKILL

So far as the availability of technical skill to Lyallpur industries is concerned it is satisfactory. Many people with good technical qualifications are avaiable for jobs. There are several technical institutions from where a good number of qualified persons every year come out. The Institute of Textile Technology is of special mention.

Thus on the basis of technical skill the Lyallpur workers may be graded as 'A'.

RESULT

Now the grades secured by Lyallpur workers in experience, attitude and technical skill need to be averaged for indicating their efficiency. For this purpose the grades have been converted into numerical values :

Experience ... C 3

Attitude

Skilled workers ... B 2

Unskilled workers ... C 3

Technical Skill ... A 1

Efficiency index 9/4=2.5= —B

Thus the efficiency of the industrial workers at Lyallpur may be rated as —B.

(MISS) SALIM AZIZ
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University of the Panjab

EIGHTEENTH-NINETEENTH ANNUAL ALL PAKISTAN SCIENCE CONFERENCE, JAMSHORO, FEBRUARY 21 TO 26, 1967

The annual All Pakistan Science Conference, combining the eighteenth and nineteenth sessions, was held this year at Jamshoro from February 21 to 26. University of Sind played the host. Following members of the Pakistan Geographical Associations attended the deliberations of the conference:

1. Dr. Kazi S. Ahmad, *University of the Panjab.*
2. Dr. K. U. Kureshy, *University of the Panjab.*
3. Dr. Miss M. K. Elahi, *University of the Panjab.*
4. Prof. M. M. Memon, *University of Sind.*
5. Dr. I. H. Zaidi, *University of the Panjab.*
6. Dr. Qazi Shakil Ahmad, *University of Sind.*
7. Dr. Jehan Ara Malik, *Government College for Women, Rawalpindi.*
8. Dr. Fazle Karim Khan, *University of Dacca.*
9. Mr. Ubedul Haq, *Dacca College.*
10. Mrs. Tamjida Begum, *Dacca College.*
11. Mr. Zafar Hasan Shah, *University of Sind.*
12. Mr. Munir-uz-Zaman, *University of Rajshahi.*
13. Mr. Jafar Raza Khan, *University of Rajshahi.*

Papers Contributed

The following papers (in Geography) were presented at the Geology, Geography & Anthropology Section:

Dr. Miss M. K. Elahi & Dr. K. U. Kureshy: Crop Pattern—West Pakistan.

Dr. I. H. Zaidi: A Functional Classification of States.

Mrs. Tamjida Begum: An analysis of irrigation in East Pakistan, its feasibility and practices.

Dr. Qazi S. Ahmad: Distribution of city sizes in Pakistan.

Dr. Fazli Karim Khan: Field Patterns in East Pakistan.

Mr. Ubed-ul-Haq: Possibility of growing crops in the dry season fallow area in East Pakistan.

Mr. Jafar Raza Khan: Land utilisation survey in Ganja cultivation area,

Symposium

Under the auspices of the Association a symposium on the Development of Industries in Pakistan was held on 24th February 1967. Dr. Kazi S. Ahmad opened the discussion and traced the historical background of the industrial development in the country from the time of independence to date. Other members who participated were:

1. Dr. K. U. Kureshy, *University of the Panjab.*
2. Dr. Fazli Karim Khan, *University of Dacca.*
3. Dr. Jehan Ara Malik, *Government College for Women, Rawalpindi.*
4. Dr. I. H. Zaidi, *University of the Panjab.*
5. Mr. S. Z. Ahsan, *University of Karachi.*
6. Mr. Ubed-ul-Haq, *University of Rajshahi.*
7. Dr. Qazi S. Ahmad, *University of Sind.*
8. Dr. Miss M. K. Elahi, *University of the Panjab.*

Various problems concerning the industrial development, *e. g.*, floods in East Pakistan, comparative usefulness of land and river transport, locational factors from the point of view of economy and strategy and socio-economic aspects of the workers (productive and non-productive) were discussed elaborately.

The Pakistan Geographical Association Meeting

The annual general meeting of the Association was held on the 24th February, 1967 in the Chemistry block, University of Sind.

The following office bearers were elected for the year 1967-68:

President :

Dr. Kazi S. Ahmad, University of the Panjab.

Vice-President :

Dr. A. I. H. Rizvi, University of Dacca.

Prof. Shamsul Islam Siddiqi, University of Karachi.

Prof. M. M. Memon, University of Sind.

Secretary-Treasurer :

Dr. Miss M. K. Elahi, University of the Panjab.

Members of the Executive Council :

Prof. A. M. Patel, University of Rajshahi.

Dr. Hamid-ud-Din Ahmad, University of Peshawar.

Dr. Jehan Ara Malik, Government College for Women, Rawalpindi.

Dr. I. H. Zaidi, University of the Panjab.

Dr. Fazli Karim Khan, University of Dacca.

Mr. Munir-uz-Zaman, University of Rajshahi.

Resolutions

The following resolutions were passed and sent to the Government :

1. The geographers be included in the various planning departments.

2. The Government Departments should cooperate in the research projects enunciated by geographers so that researchers may find it easy to collect relevant material and data from the various government departments.

(Miss) Maryam K. Elahi
University of the Panjab

SYED MUZAFFAR ALI, 1909—1966

Late Professor S.M. Ali belonged to that senior group of geographers of this sub-continent who gathered at Aligarh in the early thirties of the current century to promote post-graduate teaching and research in geography.* In him we have lost a doyen, a great geogiapher, an inspiring teacher and an enlightened educationist. Many of his students are occupying leading positions in various educational institutions of India and Pakistan. His sudden and untimely demise has shocked us all. May his soul rest in peace. Amen.

As a geographer Dr. Ali started his career rather late. First, he did M.A. in Mathematics and accepted an employment as a lecturer in Mathematics at Islamia Cotlege, Peshawar. However, he resigned from this post and came back to Aligarh in 1931 to do his M.A. in Geography. With a sound background in Mathematics, it was natural that Dr. Ali became specially interested in Mathematical Geography and Cartography. Having done meritorious work he passed the M.A. Examination in 1934; and in the same year joined the Aligarh Muslim University as a member of the teaching staff of the Department of Geography. For Ph.D. he proceeded to London in 1937 and joined Birkbeck College. Under Professor E.G.R. Tayler he wrote his doctoral thesis on Ghaggar plain in 1939 which was highly commended.

On his return from London Dr. Ali was promoted to senior lectureship and continued with his brilliant services to the geography department of Aligarh. In 1945 he was appointed as Reader and Head of that department and became professor in 1956. The grand success of the I.G.U. Seminar at Aligarh in 1956 ows a great deal to Dr. Ali who was mainly responsible for its organization and conduct.

He was to organize one of the Symposia on Historical Geography at Saugar on the occasion of the twenty-first International Geographical Congress scheduled to be held at Delhi in October-November 1968.

In 1958 Dr. Ali was nvited to organize the post-graduate department of Geography at the University of Saugar, Madhya Pradesh. Much as he would like to stay at Aligarh for reasons of long attachment, Dr. Ali accepted the offer

*It might be of interest to note that Aligarh was the first institution in the sub-continent where the department of Geography was established in 1924.

with a view to serving the cause of geography in the sub-continent. He left for Saugar and continued there as professor and Chairman with full devotion and enthusiasm till his last.

Dr. S.M. Ali contributed many papers, mainly on Mathematical Geography to various Indian periodicals. He had travelled far and wide in the sub-continent in connection with extension lectures and examinations of various universities. He also visited Pakistan Universities, particularly Panjab University as examiner and on lecture tour.

Apart from his academic interest Dr. Ali also showed great enthusiasm about military science. At Aligarh he was appointed Officer Commanding of the University Officers Tranining Corps (U.O.T.C). It was through his efforts that a separate department of Military Science was established at Aligarh. Then, as a man he was extremely popular. The people at Aligarh, Saugar and all those who have met him cherish very sweet memories of his. Hailing from Agra, the city of Muslim cultural heritage, Dr. Ali had settled in Aligarh, the city of Muslim renaissance as some would put it.

Dr. S.M. Ali died of heart failure on December 30, 1966 while attending a meeting at Delhi and is buried at Aligarh. He is survived by a widow, five sons and two daughters. The eldest son is a lecturer in English formerly at Delhi. After the death of his father, he was given the appointment by Saugar University. Out of extreme regard for the departed soul, one of the halls at Saugar University has been named as 'Ali Hall'. What a great tribute! His name will go down in the history of that great institution.

KAZI S. AHMAD

University of the Panjab.

Arab Geography in the Ninth and Tenth Centuries. S.M. Ziauddin Alavi, Department of Geography, Aligarh Muslim University, Aligarh (1965) XIII+34 pp, maps, bibliography, index, errata.

Dr. Ziauddin Alvi's book is a welcome addition to the existing works on Muslim contribution to geography. Keeping in view the dearth of literature on this subject in English language and its importance in the development of geographical knowledge, the usefulness of the book under review cannot be exaggerated. *Arab Geography in the Ninth and Tenth Centuries,* in fact, fills a gap and will go a long way to help those interested in the history and development of geography as a scientific discipline, with particular reference to Muslim geographers in the Middle Ages. It is very satisfying to see that the Department of Geography at Aligarh is fully aware of the need and importance of such works.

The book focusses on the ninth and tenth centuries—a period during which most of the outstanding Muslim geographers lived and made brilliant contribution. The book has been divided into three parts and twelve chapters. The first chapter in Part I gives an outline of geography from the earliest times to the beginning of Arab awakening. In this chapter the ideas of Babylonians, Phœnicians, Indians, Persians, Greeks, Romans and the Christian Pilgrim travellers have been skilfully summarized. The second chapter is short and lays emphasis on the transition period.

In Part II of the book which includes Chapters III and IV a survey of the Arab geographical literature of the period under study has been presented. Part III of the book is spread over eight chapters. The chapters from V to XI deal separately with factual as well as conceptional aspects of the various branches of geography: (1) Mathematical Geography, (2) Physical Geography, (3) Biogeography, (4) Human Geography, (5) Travels, Explorations and Discoveries, (6) Regional Geography, (7) Economic Geography.

From the extensive bibliography and profuse footnotes, it is apparent that the author of this book has taken great pains in digging into the original works in Arabic as well as those which have been translated by orientalists.

There are, however, several places in this book where the statements and conceptual problems need to be more adequately treated. For example on page 89 it has been stated that "Arab geographers in their study of the towns emphasised especially its location". In this context the names of Mecca, Amman and Istakhr are cited as examples of the towns situated in a valley surrounded by hills. But the locational significance of these places has not been duly explained.

There are cartographic defects in some of the maps as well, In plate 12 "Road Map" three types of lines have been drawn without giving a proper index. Proof reading has also not been carefully done.

However, the work is on the whole commendable.

KAZI S. AHMAD

University of the Panjab

Die Alte Welt—Der Orient. Die Steppen und Wüsten der Nordhemisphäre mit Ihren Randgebieten. Oskar Schmieder, Franz Steiner Verlag GMBH. Wiesbaden, 1965. 462 pp. maps, diagrams, pictures, bibliography and index.

Oskar Schmieder is one of the very senior geographers, a chapter in German geography, an image of Hettner, and a successful writer. He is one of the associates of Berkeley school of geography, founded by Carl Sauer. In the old world, or at least in a part of it, his influence is also strong. As a Chairman of the Geography Department of Karachi University, during the years 1953-55, he suggested and outlined some

studies, which are still enthusiastically pursued.

Oskar Schmieder wrote many books on the New World. His *Landerkunde von Sudamerika* was published in 1932; *Landerkunde von Nordamerika* in 1933; *Landerkunde von Mittleamerika* in 1934; *Geografia de America* in 1946; *Geografia del Viejo Mundo* in 1955; *Geografia de la America Latina* in 1965; and two volumes of *Die Neue Welt* in 1962 and 1963, respectively.

With this background, the *Alte Welt* is a welcome addition to the geographic literature on the Orient. Schmieder has read widely in the scattered literature, and has the competence to render it successfully. In addition to a compact style and a scholar's experience of the literature the major strength of this book lies in the *Landerkunde* method of Alfred Hettner and Robert Gradmann. This method takes one far beyond the descriptive regional geography, to the one which explains the imprints of man through time.

Schmieder dedicated the *Alte Welt* to Alfred Hettner, his teacher, with grateful memories, and organised 462 pages of the book in a manner not found in any other book on the Orient. The first twenty-one pages deal with the discovery and physical milieu of the old world. The next thirty-two pages discuss Men—their economy, religion, ideologies: habits, etc. This is followed by forty-three pages on the dry belt of northern hemisphere. The remaining 365 pages deal with major areas, and their political divisions. All along he takes his readers through the great and small regions, with a great deal of interest, tracing the landscape back to their roots. The complexities of the present landscape and the rapid changes in the Orient, the steppes and deserts of the Old world are well brought out. In short, the *Alte Welt* is an exceedingly successful attempt to present the interactions between land, man, and culture in a complicated area like Asia. It will long serve as a 'model' for younger geographers.

The text is strengthened by 121 instructive maps and diagrams. The block effect adds up to the quality and readability of maps. The pictures at the end, including a few in colour, make the book more useful and interesting.

The German language text will obviously restrict the readership in Asia and the English speaking world, but may be some of his student, some day translates it into English.

MUSHTAQ-UR-RAHMAN

University of Karachi

INDEX

TO VOLUMES 18-22, 1963-67

PAKISTAN GEOGRAPHICAL REVIEW

The Editors are indebted to Mr. Aziz-ur-Rehman Mian for the preparation of this index.

PAKISTAN GEOGRAPHICAL REVIEW was instituted in 1949 replacing Punjab Geographical Review which was started in 1942. The object of this publication is to further dissemination and exchange of scholarly knowledge. Its volumes contain research articles on various topical and regional themes of Geography with particular reference to Pakistan. The Review is published half-yearly in January and July.

Submit all manuscripts and publications for Review to the Editor, Pakistan Geographical Review, Department of Geography, University of the Panjab, Lahore.

Address all communications regarding subscriptions and purchase of the back numbers to the Manager, Pakistan Geographical Review, Department of Geography, University of the Panjab, Lahore.

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