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LOCATION ANALYSIS IN CENTRAL AREA: A CASE STUDY OF COVENTRY*

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ABSTRACT.—*Various techniques which have been evolved for the study and analysis of Central Area/CBD by research workers in different parts of the world, have been briefly reviewed with reference to the city of Coventry (U.K.).*

The study analyses in detail the spatial distribution of activities in Coventry's Central Area in relation to various factors affecting their distribution. Data for this paper was collected by field work.

One of the most important functional zones in modern city is the Central Area which is a focus of the commercial and business activities for the whole city and its region. It is characterised by special features of land-use and is the scene of highest land value within its locality. Accordingly, it has received considerable attention in a number of related fields viz., Geography, Planning, Sociology, and Economics.

The city centre research dates back to 1930's, when Proudfoot in his study on the city retail structure referred to the city centre (C.B.D.) as, "The retail heart of the city with a marked concentration of shopping goods stores, which serve a substantial proportion of the commodity wants of every city family and which are located within that focal area of intra-city transportation most accessible to the entire city Population."[1] Considerable work has been carried out since the time of Proudfoot on the Central Business District. These various studies which have been reviewed elsewhere*** vary from the rigid definition of C.B.D. by Murphy and Vance[2] to a very generalised definition of Rannells.[3]

A broad definition of the Central Area was attempted in this study with a view to give room to more concentrated central activities and also others not so concentrated but centrally located. The distribution of a set of accepted and recognised central functions were used for this broad identification of Coventry's Central Area. These functions not only included those mentioned by Murphy and Vance,[4] but also wholesale trade as well as civic and administrative fun-

*This Article is based on Ph.D. Thesis Work carried out at Birmingham University U.K. Data was collected in 1970.

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***See Khan M. A. (1972), "Growth and Morphology of The Central Area of Coventry," Ph.D. Thesis, University of Brimingham.

ctions, which add to the general character of the area under study. The boundary of this widely defined area is shown in Fig. 1.

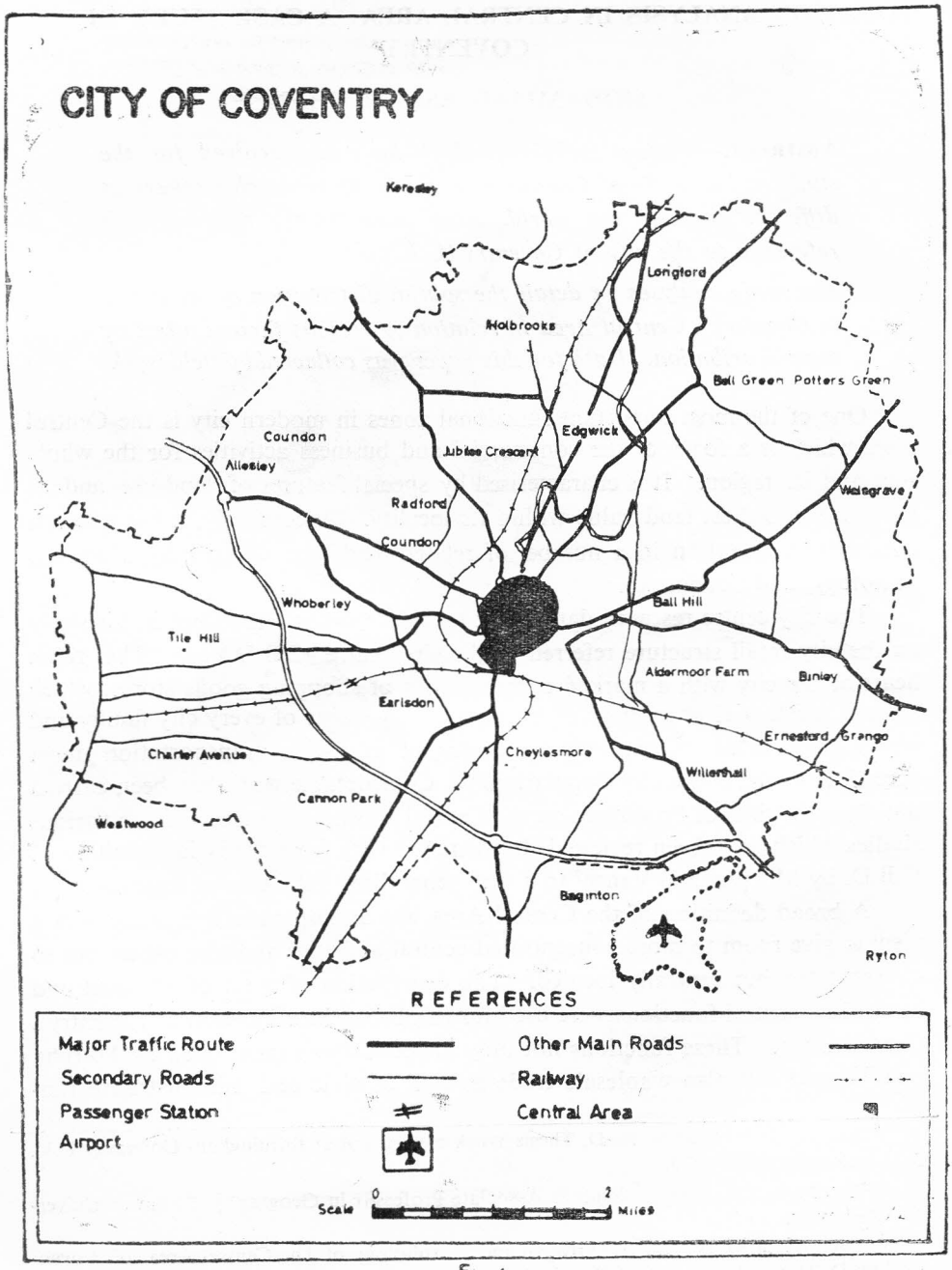

Fig 1

The defined area contains a district of intense activity or retail core. It is within this core of 52.7 acres that shopping is found to be forming the live nucleus of the town.[5]

The civic and administrative zone occupies an area of 61 acres at ground floor level. Lanchester Polytechnic occupies maximum area in this zone. The rest of the Central Area is occupied by other functions e.g. residential, industrial, whole-saling and warehousing.

Internal Structure of the Central Area

There have been developed three major methods for the analysis of structural zones and component elements of the Central Area. They are as follows:—

(*a*) *Gradient Analysis.*—It is the study of land-use gradient or functional intensity in successive distance zones from the peak land value inter-section or retail node. This can be called as Murphy, Vance, and Epstein method.[6]

(*b*) *Grid Square Analysis.*—This method uses a Grid Square system of analysis of land-use similar to that used by Rannells[7] in his study of Central Philadelphia.

(*c*) *Analysis of Structural Zones.*—According to this method C.B.D. is divided into distinct structural zones e.g. inner and outer retail zones and office zone. This technique was used by Peter Scott[8] in his study of the Australian C.B.D. Other methods in the same category include (*i*) Subdivision of C.B.D. by isolating the core and frame.[9] (*ii*) Isolation of hard core from the adjacent area, as done by D. H. Davies[10] in his study of Cape-town. Studies of Diamond[11] and Carter[12] also fall in the same category.

It is extremely difficult to apply the Gradient analysis technique to the Central Area of Coventry since the peak land value inter-section here does not coincide with the geographic centre. The redevelopment of certain parts of Central Area complicates this type of analysis. The "Grid Square Analysis" employed in the study of Philadelphia, an American city, where the roads have a grid pattern, is also not suitable for use in the case of Coventry, where the road pattern is irregular and the blocks are of different shape and size.

Peter Scott's[13] method was found more suitable for the local conditions. It provides a useful frame-work for the underlying system of activities of the Central Area. Scott had divided the Australian Central Business Districts into three major structural zones viz. inner retail zone, outer retail zone, and office zone. The inner retail and office zones were defined by blocks having 50% of the ground floor central business frontage of a block or a contiguous portion of a block devoted to either department, variety and women's clothing stores together with associated retail outlets and services catering distinctly for women,

Fig. 2

or to offices respectively. The outer retail zone had at least 50% of its frontage devoted to retailing, and at least 50% in general, to stores retailing in household goods and services.

The method was applied to Coventry with certain modifications. Scott had given no consideration to civic and administrative uses which form a very important part of central functions in Coventry. It was, therefore, necessary to devise a method for delimiting the civic and administrative zone alongwith the others. This zone was defined by areas having 50% frontage of the block or a contiguous portion of a block to civic and administrative functions.*

Some modification was needed in the inner and the outer retail zones as well, for example footwear stores as seen from (Fig. 5) show a noticeable concentration along major shopping streets such as The Precinct and Smith-ford Way.

It was therefore, considered necessary to add them to the list of primary retail elements for defining the inner retail zone. In the outer retail zone, the condition of 50% of household goods and services fell short in case of the block frontage west of Queen Victoria Road. This was, however, included within the zone because the secondary retail elements still dominated the area. Slight modification was also made in the office zone west of Warwick Road, to keep its continuity.

The zonal structure** resulting from the application of Scott's technique in modified form is shown in Fig. 3. The inner retail zone occupies a compact part of the western half of the Central Area and is characterised by stores selling durable goods which demand more central location. The outer retail zone encircling the inner retail zone is rather discontinuous in the northwest. It is characterised by stores retailing in household goods, services and other retail elements of more diverse and less inter-related nature than elements of inner retail zone. There is also a secondary nucleus of the outer retail zone in the New Union Street.

The main office zone lies south of the retail zone but there are two secondary nuclei south of High Street and north of Corporation Street respectively. These secondary nuclei comprise banks, building societies, and office facilities which derive certain advantages from their association with retailing, such as large pedestrian flow. The main office quarter has a mixture of all types of offices

*Public buildings and places of assembly considered suitable for inclusion in the civic zone: 1. Art Gallery. 2. Public Bath. 3. Central Government Office. 4. Chapel. 5. Church. 6. Clinic. 7. Club (Non-residential). 8. College. 9. Community Centre. 10. Concert Hall. 11. Law Courts. 12. Fire Station. 13. Institution (Professional). 14. Institution (Learned Society). 15. Local Government Offices. 16. Meeting House. 17. Museum. 18. Public Library. 19. Police Station. 20. Social Centre. 21. Bus Station. 22. Telephone Exchange.

**Car parks in Coventry have such a location that they also had to be included wherever necessary to avoid discontinuities in the inner retail zone.

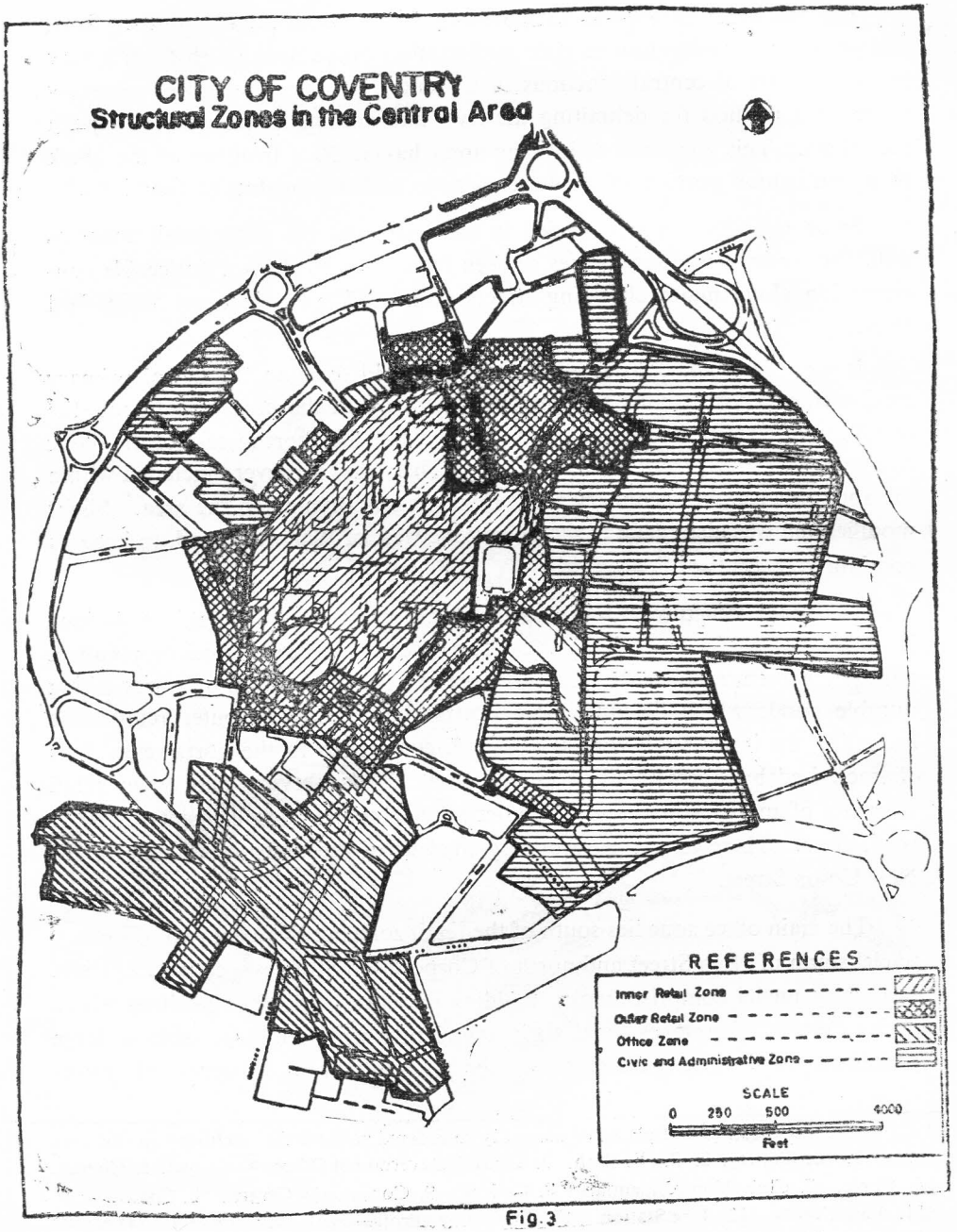

Fig. 3

and it is the location of this zone in the south which has created a discrepancy between the peak land-value intersection and the geographic centre of the commercial area.

The civic and administrative zone lies in the eastern half of the Central Area.* A large amount of space in this area is occupied by the Lanchester Polytechnic (34, Fig. 2) and the bus-station (9, Fig. 2) but there are also large number of Government offices to be found here.

They include the Old Council House (37, Fig. 2) the New Council House (53, Fig. 2) the offices of the Ministry of Employment and Productivity, and the Law Courts. Other uses which have affected the character of the civic zone include churches, public bath, art gallery and museum, library, theatres and cinemas (Fig. 2). There are some parts of the Central Area which have not fallen in any of the four zones mentioned above (Fig. 3). They form a residual mixed zone. Many parts of this zone are being developed. A major portion of this zone, in the eastern half of the Central Area, has been allocated for civic and administrative purposes. The area along peripheries in the western half, however, form a mixed zone devoted to warehousing, whole-saling, industrial and residential functions.

Individual Retail Elements and Commercial Offices

De Blij[14] in his study of Lourenco-Marques used a method, whereby the distribution of various commercial functions were analysed in terms of distance of their mean point from the "retail node". This "retail node" was a mean point of all central business functions and not the mean point of department stores, which were thought to be less significant in Lourenco-Marques. In Britain, however, the department and variety stores play a very prominent role in retailing. They not only cater for all classes of people but also have quality and service as their main appeal. In Coventry they are occupying central sites and are main areas of pedestrian attraction. It was, therefore, decided to take the mean point of department and variety stores as the retail node, (Fig. 4) and analyse the distribution of establishments themselves rather than their mean points in relation to this node.

In the contemporary Central Area, four distinct types of retail elements can be discerned from the distribution maps (Fig. 4 to 11). These include:—

(*a*) Primary inner retail elements.
(*b*) Secondary inner retail elements.
(*c*) Secondary outer retail elements.
(*d*) Primary outer retail elements.

These four types of inner and outer retail elements, were identified by Scott, in his study, "The Australian C.B.D."[15] The following analysis will be baded on this locational characteristic of various elements within the Central Area.

*A Secondary nucleus of civic function also exists in Hill Street area, where one finds ancient St. John Church, Bond Hospital and Friends Meeting Room (Fig. 3).

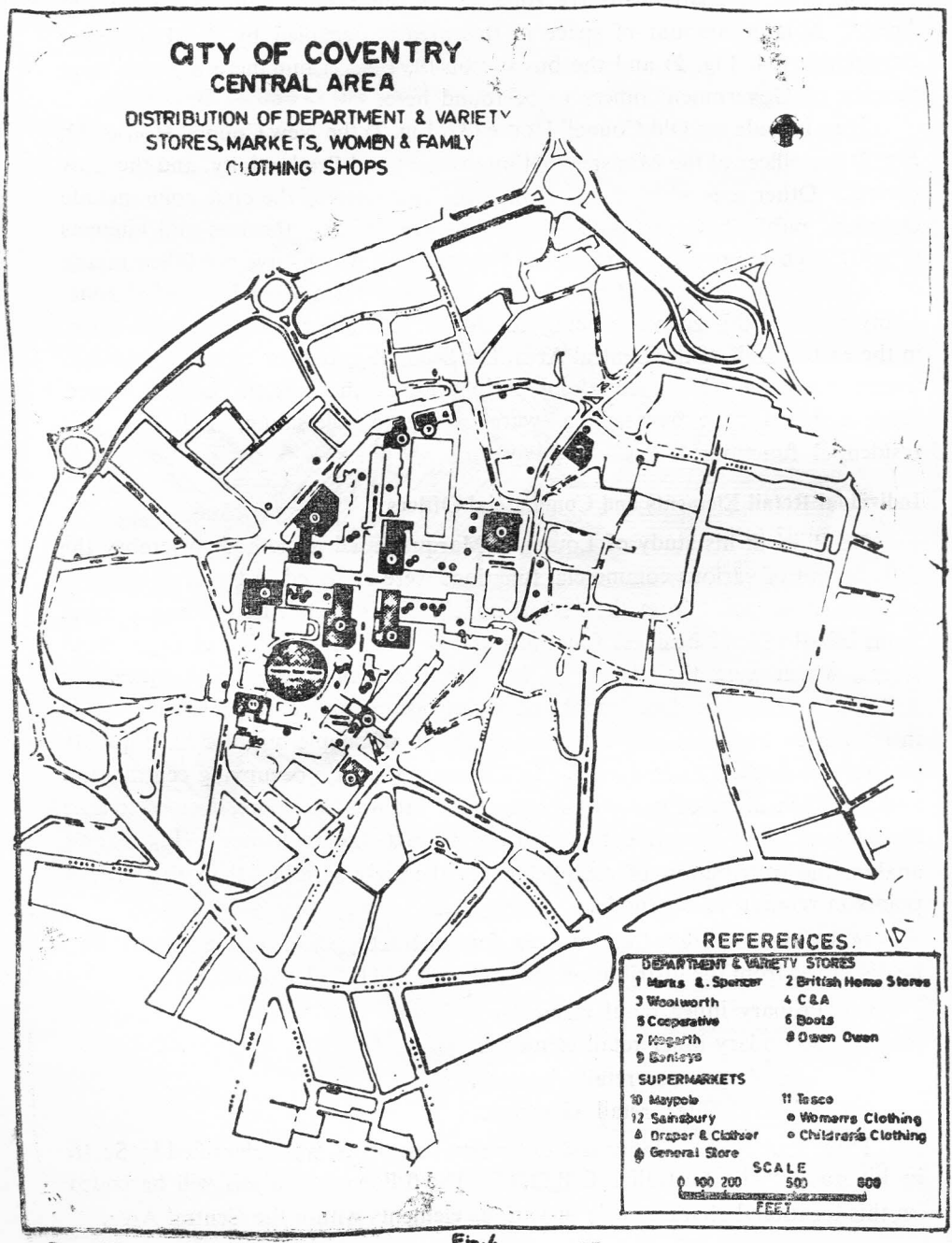
CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF DEPARTMENT & VARIETY STORES, MARKETS, WOMEN & FAMILY CLOTHING SHOPS
REFERENCES.
DEPARTMENT & VARIETY STORES
1 Marks & Spencer
2 British Home Stores
3 Woolworth
4 C&A
5 Cooperative
6 Boots
7 Hogarth
8 Owen Owen
9 Bonleys
SUPERMARKETS
10 Maypole
11 Tesco
12 Sainsbury
Womens Clothing
Draper & Clothier
Childrens Clothing
General Store
SCALE
0 100 200 500 800
FEET

Fig.4

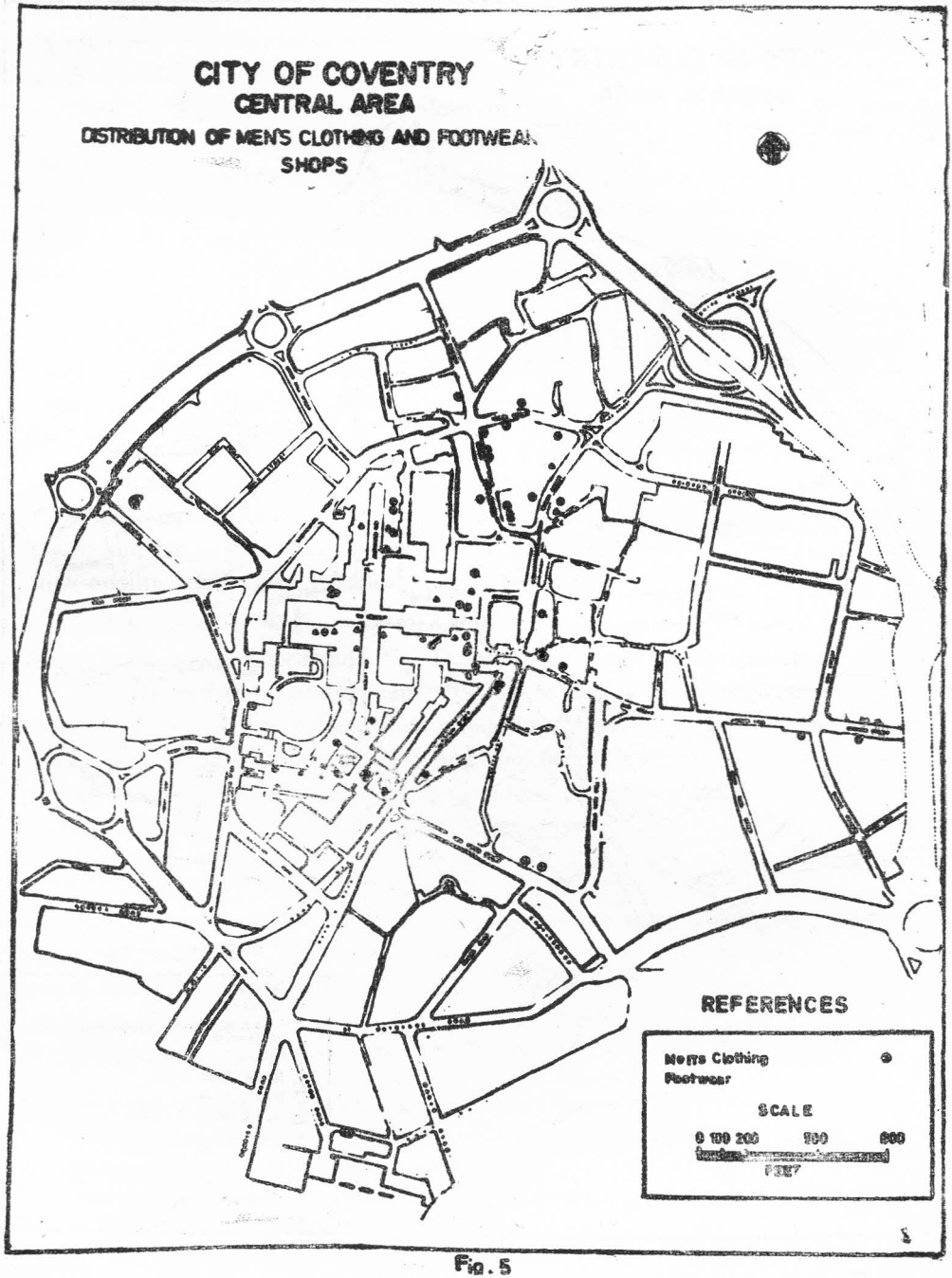
CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF MEN'S CLOTHING AND FOOTWEAR SHOPS
REFERENCES
Mens Clothing
Footwear
SCALE
0 100 200 400 600
FEET

Fig. 5

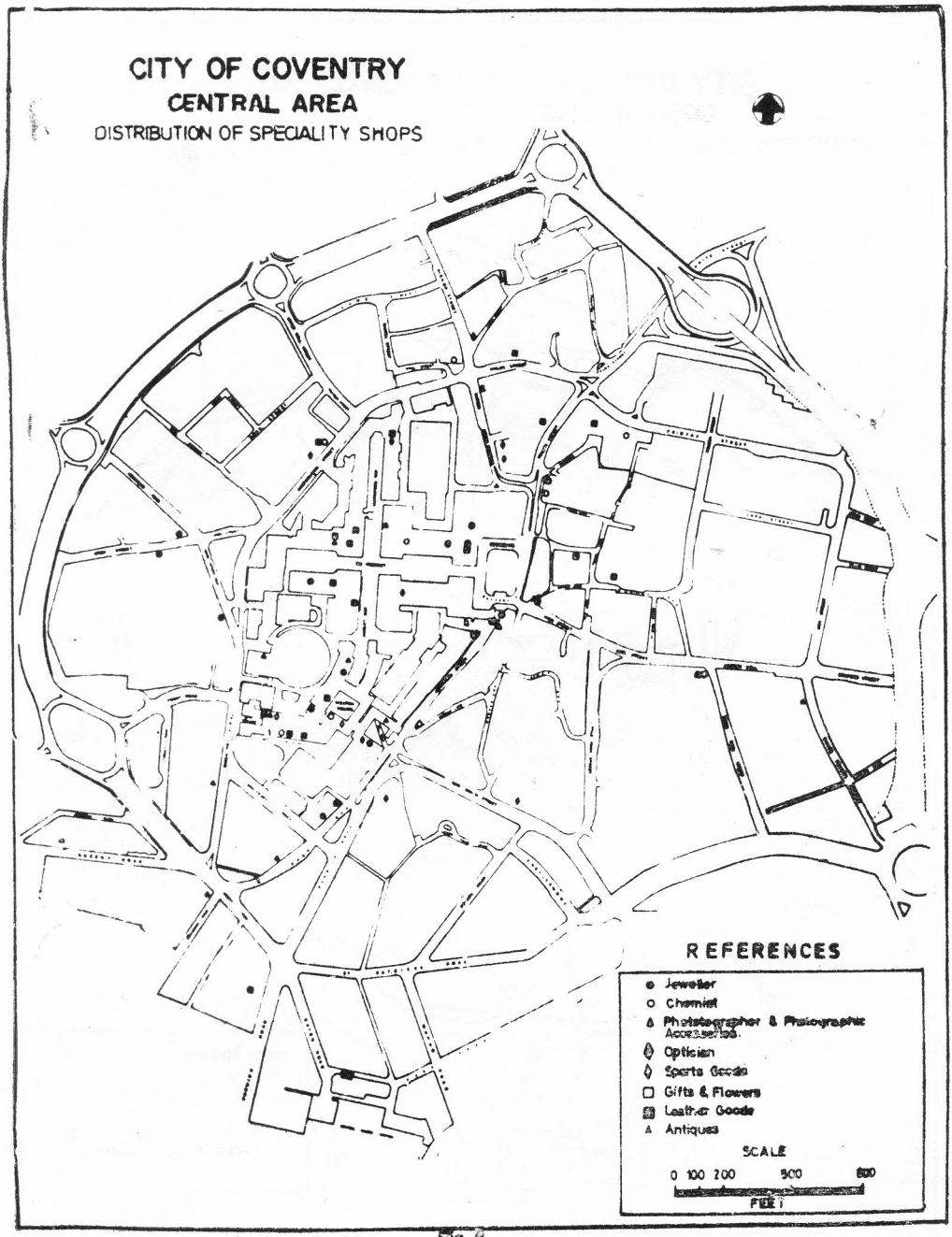
CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF SPECIALITY SHOPS
REFERENCES
Jeweller
Chemist
Photographer & Photographic Accessories.
Optician
Sports Goods
Gifts & Flowers
Leather Goods
Antiques
SCALE
0 100 200 500 800
FEET

Fig. 6

Primary Inner Retail Elements:

The sequence of Primary inner retail elements outward from the node is variety stores, toy, record, and women's clothing. Three department stores Woolworth, British Home Stores and Marks and Spencer occupy the key positions in the three corners* around the retail node (which is also the peak land-value intersection and peak pedestrian flow point). Apart from this main cluster, the rest of the department and variety stores are located on the edges of the inner retail zone (Fig. 4). Owen Owen occupies a central location just near the bus terminal from where it can directly attract customers. The co-operative store and C & A (clothing store) enjoy the advantage of having entrances both on The Precinct and Corporation Street, while Boots have a strategic location between Corporation Street and Smith-ford Way. Hogarth and Benleys (Fig. 4) have comparatively less advantageous positions, though the former is relatively more fortunate in being fairly closely adjacent to Boots. Benleys isolated location is partially compensated by its popular price appeal.

Pasdermadjian[16] has noted that the department stores usually cater for either middle or higher income classes or the popular middle class. None of the three department stores in Coventry fit exactly in the former category. Owen Owen and Hogarth attract mainly the middle class but they do not offer very high quality articles like Rackhams of Birmingham.

Other Primary inner retail elements in Coventry are Women's clothing shop, a toy, and a record shop.** The distribution of women's clothing shops show a clear symbiotic relationship*** with the department and variety stores. They show the largest concentration along the entrance and sides of the Upper Precinct. Lower Precinct, Market and Smithford Ways are the other main thoroughfares having women's clothing shops. The outer retail zone also has some of these shops of comparatively inferior type.

Secondary Inner Retail Elements:

Secondary inner retail elements are those which show a dominance in the inner retail zone, but extend considerably into the outer retail zone. Footwear stores are the only ones in Coventry which fall under this category. They approach close to the retail node (Fig. 5), for perhaps there is more window shopping done in women's shoes than in any other class of retail trade.[17] Of

*The fourth corner is occupied by a large furniture store (Wades).

**Since the toy and record shops are only one each they have been shown on the distribution map under the category of fancy goods (Fig. 6).

***This relationship between the establishments for mutual advantage was termed as linkage by Rannells. (Rannells J. The Core of the City, New York, 1956).

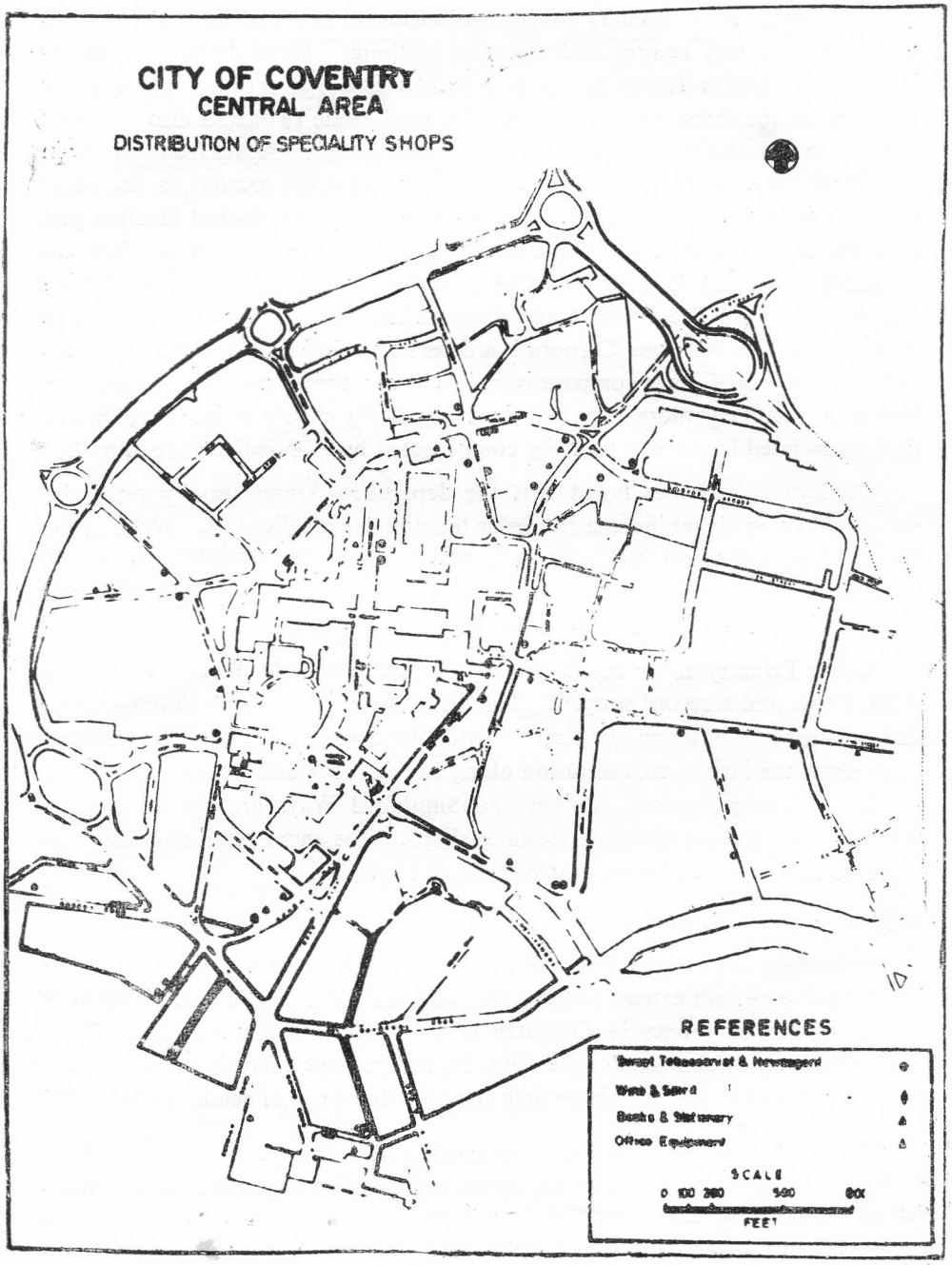
CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF SPECIALITY SHOPS
REFERENCES
Sweet Tobacconist & Newsagent
Wine & Spirit
Books & Stationary
Office Equipment
SCALE
0 100 200 500 800
FEET

Fig. 7

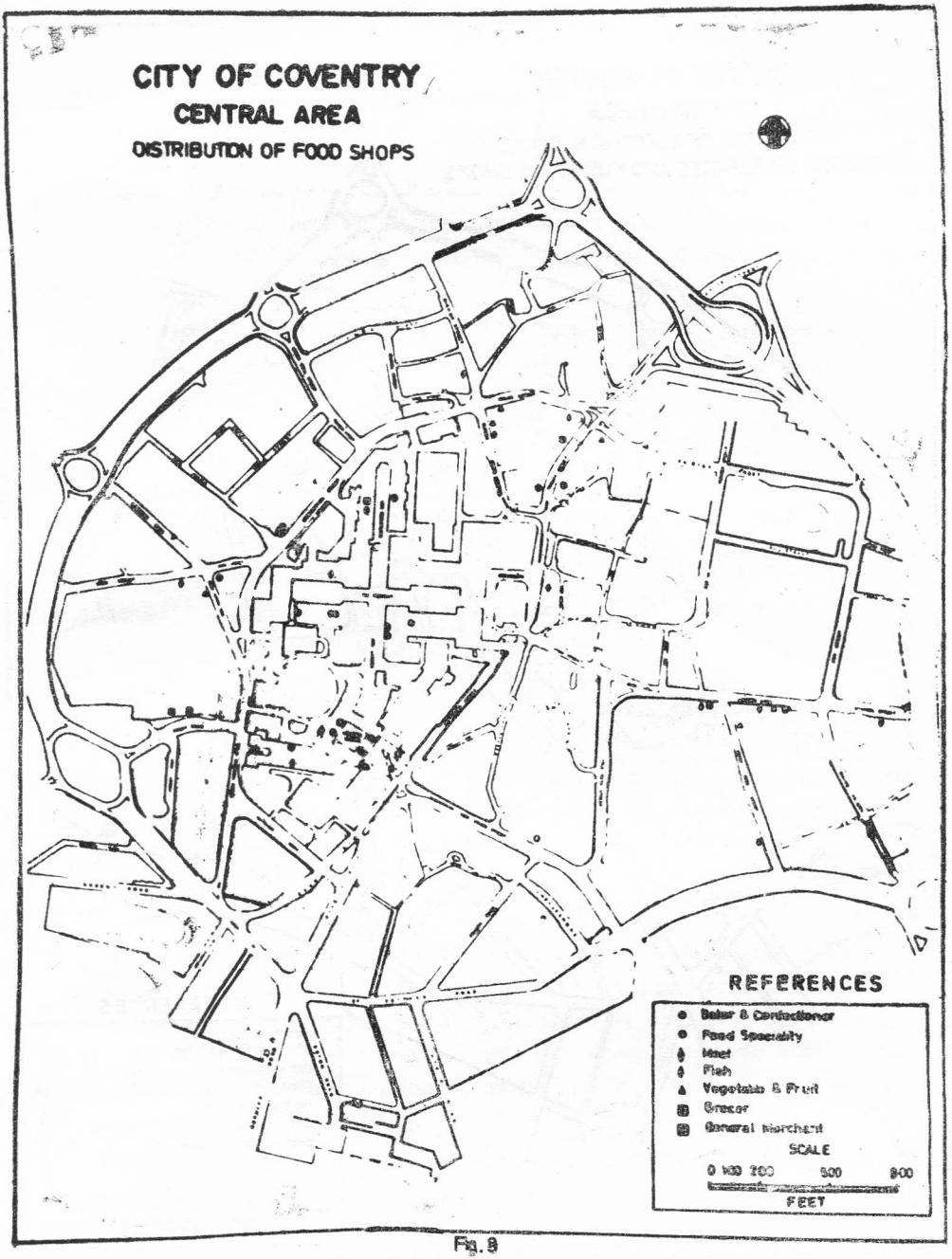
CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF FOOD SHOPS
REFERENCES
Baker & Confectioner
Food Specialty
Meat
Fish
Vegetable & Fruit
Grocer
General Merchant
SCALE
0 100 200 500 800
FEET

Fig. 8


CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF ELECTRICAL GOODS
HOUSEHOLD APPLIANCES AND FURNITURE SHOPS
REFERENCES
Furniture
Electrical Goods & Appliances
Other Household Appliances
China and Ornamental Wares
Wallpaper and Paint
Seedsmen & Gardening Equipment
Second Hand Goods
pet Store
SCALE
0 100 200 500 800
FEET

Fig. 9

the 28 shoes shops in the Central Area as many as 17 are located in the inner retail zone while the other 11 are in the outer zone.

Secondary Outer Retail Elements:

The Secondary outer retail elements are far more numerous than the inner retail elements in Coventry. They are regarded as essentially transitional, representing a gradation from absolute centrality to peripheral sites. The location of many of these shops represents a compromise between desire for window display and lower rents. The following groups of shops represent this tendency in Coventry:

(*a*) Jewellers, Chemists, Opticians, Gift Stores, Camera, and Sports Goods (Fig. 6).
(*b*) Men's Clothing (Fig. 5).
(*c*) Book-sellers and Stationers, and Wine and Spirit Merchants (Fig. 7).
(*d*) Furniture, Electrical Goods, Hardware and Household Appliances (Fig. 9).
(*e*) Food Shops (Fig. 8).

Of these jewellery stores, particularly those along The Precinct show a closer association with women's clothing stores. Among the chemists, a small branch of Boots is very near the retail node (Fig. 6). Most of the others, particularly the multiples (Green) though located outside the inner retail zone occupy positions where they can attract sufficient number of customers. Opticians rely more on special visits and do not require extreme centrality. Their distribution (Fig. 6) show that all opticians except one who is occupying a shop unit on the upper level walk of Upper Precinct are located away from the retail node. Gift stores, cameras, and sports goods shops need window display and therefore show a comparatively greater centrality amongst the secondary outer retail elements.

Men's clothing stores show a distribution on main street sites. Although they do not require window display to a marked degree, they are more dependent upon their reputation. A number of these stores are located in the immediate vicinity of Broadgate, where they are able to display clothes to nearby office workers. Book-sellers and stationers, as evident from their distribution, also do not require absolute centrality.

Scott[18] classified furniture and household appliance shops as primary outer retail elements from his experience in Australia. These establishments, together with electrical goods shops form the secondary outer retail elements in Coventry. In spite of their considerable floorspace requirements they are well represented within the inner retail zone (Fig. 9). Perhaps it is because they

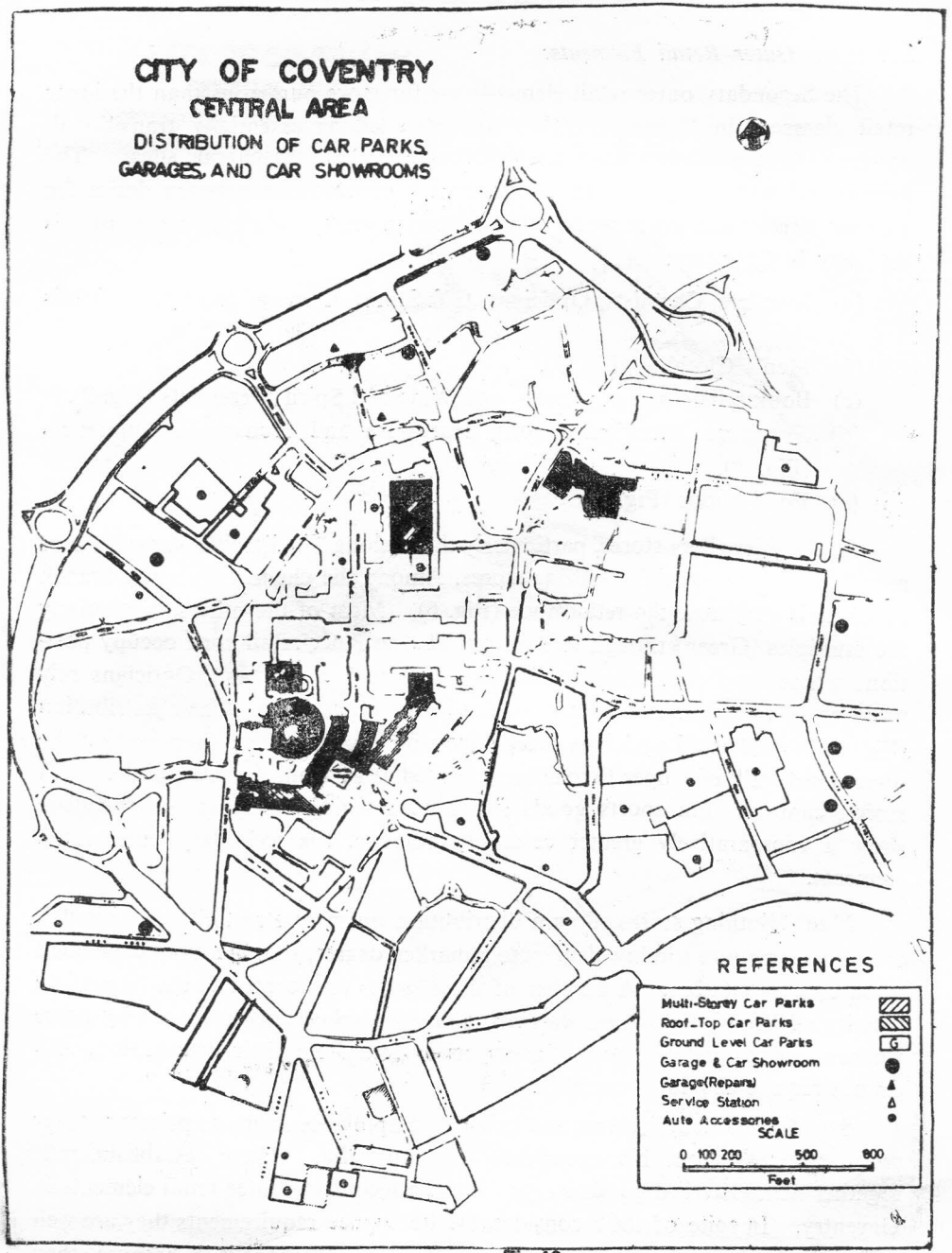
CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF CAR PARKS, GARAGES, AND CAR SHOWROOMS
REFERENCES
Multi-Storey Car Parks
Roof-Top Car Parks
Ground Level Car Parks
Garage & Car Showroom
Garage(Repairs)
Service Station
Auto Accessories
SCALE
0 100 200 500 800
Feet

Fig. 10

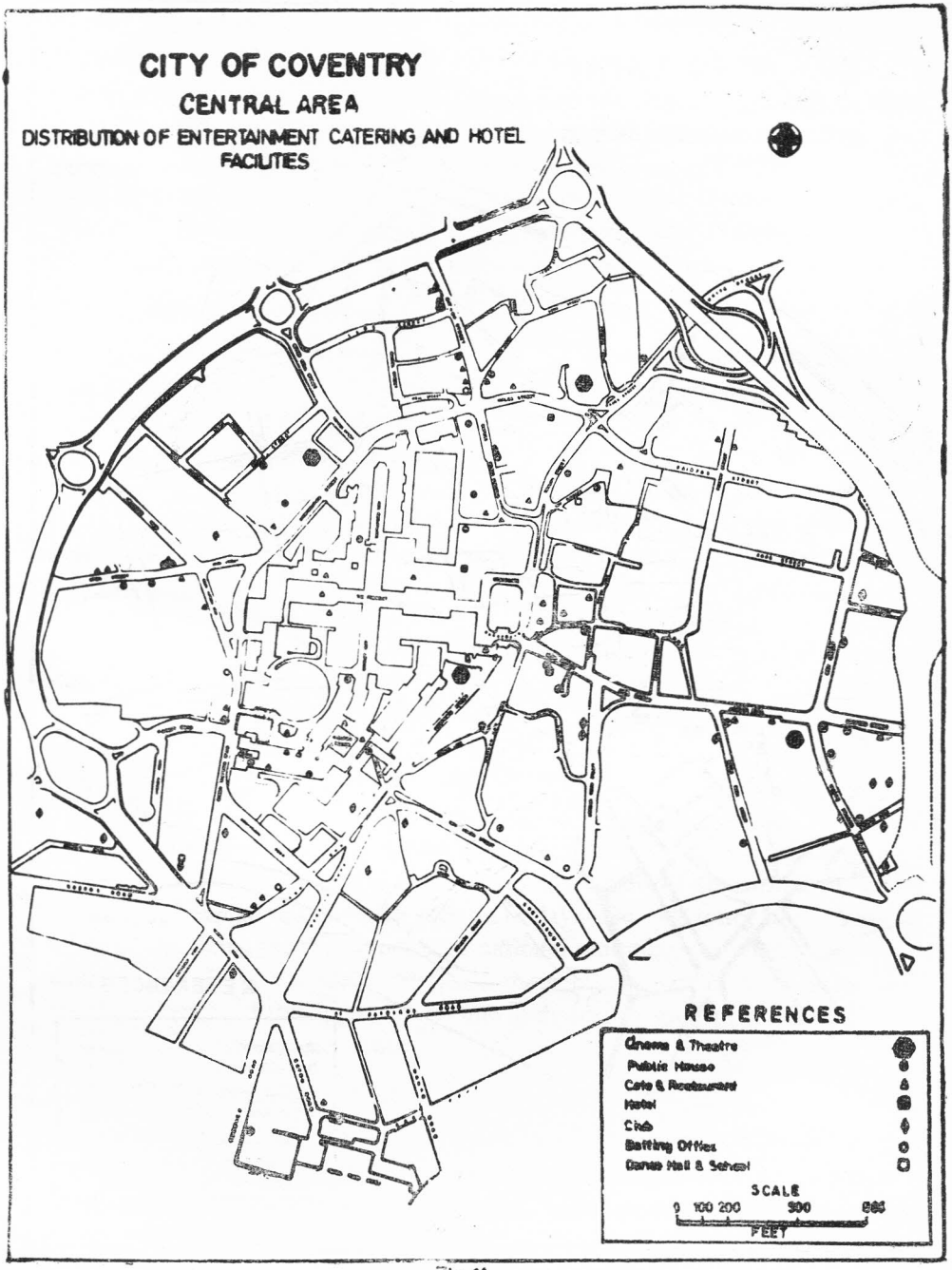
CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF ENTERTAINMENT CATERING AND HOTEL FACILITIES
REFERENCES
Cinema & Theatre
Public House
Cafe & Restaurant
Hotel
Club
Betting Offices
Dance Hall & School
SCALE
0 100 200 300 665
FEET

Fig.11

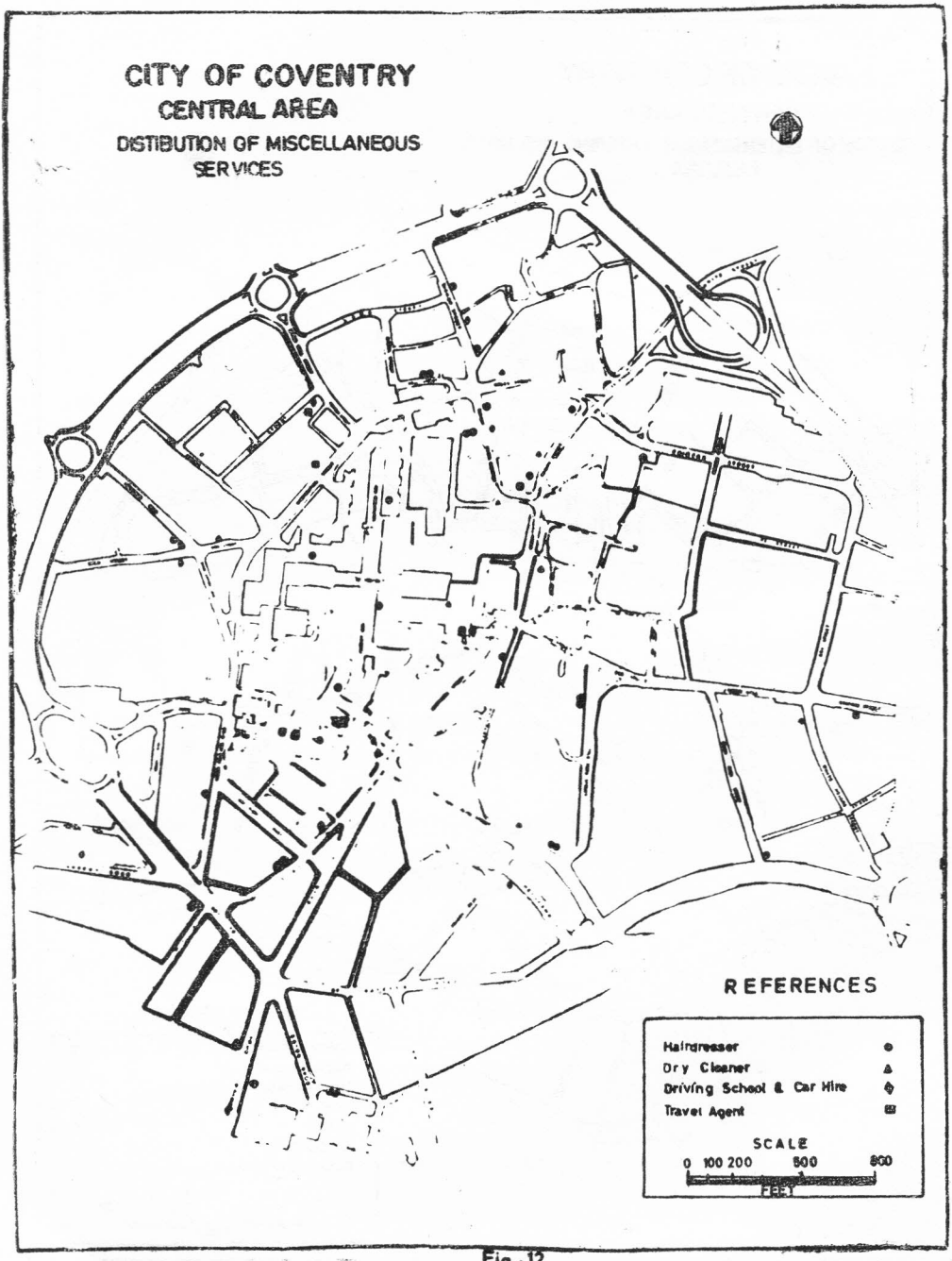
CITY OF COVENTRY
CENTRAL AREA
DISTIBUTION OF MISCELLANEOUS SERVICES
REFERENCES
Hairdresser
Dry Cleaner
Driving School & Car Hire
Travel Agent
SCALE
0 100 200 500 800
FEET

Fig. 12

cater more for female shoppers. Upper Precinct has a fair number of these shops which are occupying the upper level shop units where they have more display space and pay less rent. Their largest concentration, however, is immediately outside (north east) the inner retail zone.

The number of food shops once dominated the Central Area (before redevelopment), have not disappeared completely (Fig. 8). A fair number of food shops are still present in both the inner and outer retail zones catering for the need of office workers who purchase their daily needs during lunch hours. The three food super-markets Sainsbury, Maypole, and Tesco are located immediately outside the edge of the inner retail zone.

Primary Outer Retail Elements:

Primary outer retail elements are the functions with least preference for sites in the inner zone. They require a substantial floorspace and/or supply occasional needs. Car showrooms and office equipment firms are the two major elements representing this group (Fig. 7 & 10). They show clear preference for marginal sites in the former case while the distribution of the latter element (Fig. 7) emphasizes its concentration in the office zone. Second hand goods and an antique shop form further minor primary outer retail elements.

Dispersed Elements:

Almost all the dispersed elements predominate in the outer retail zone, but they are also present in the inner retail zone. They include public houses, cafes, and restaurants (Fig. 11) and sweet, tobacconist, and news agents (Fig. 7). Most of the services such as hair dressers, dry cleaners and travel agents (Fig. 12) also show the same tendency.

Regarding the overall retail pattern one would think that because of large scale redevelopment probably the shopping centre would attract only concerns with relatively large income e.g. multiples and national stores, which would have enough capital resources for such an outlay. But this is not true. Though many of the shops are the branches of national multiples, yet retailing on small scale has also been provided. Shops in the southern part of inner retail zone are the examples of this type. Here, one finds smaller quality shops which are lacking elsewhere in the centre.

Office and Entertainment Facilities:

Like retail business, the office functions also have some variation in their requirement of centrality and show close complementary linkages. Financial offices such as banks, building societies, and insurance companies show a closer association with retailing. This association has resulted in some overlapping of retail and office uses in High, Hertford, and Corporation Streets. A major


CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF FINANCIAL OFFICES AND BANKS
REFERENCES
Banks
Building Society
Insurance Company & Broker
Other Financial Offices
(Stock & Share Brokers Loan Offices)
SCALE
0 100 200 500 800
Feet

Fig. 13

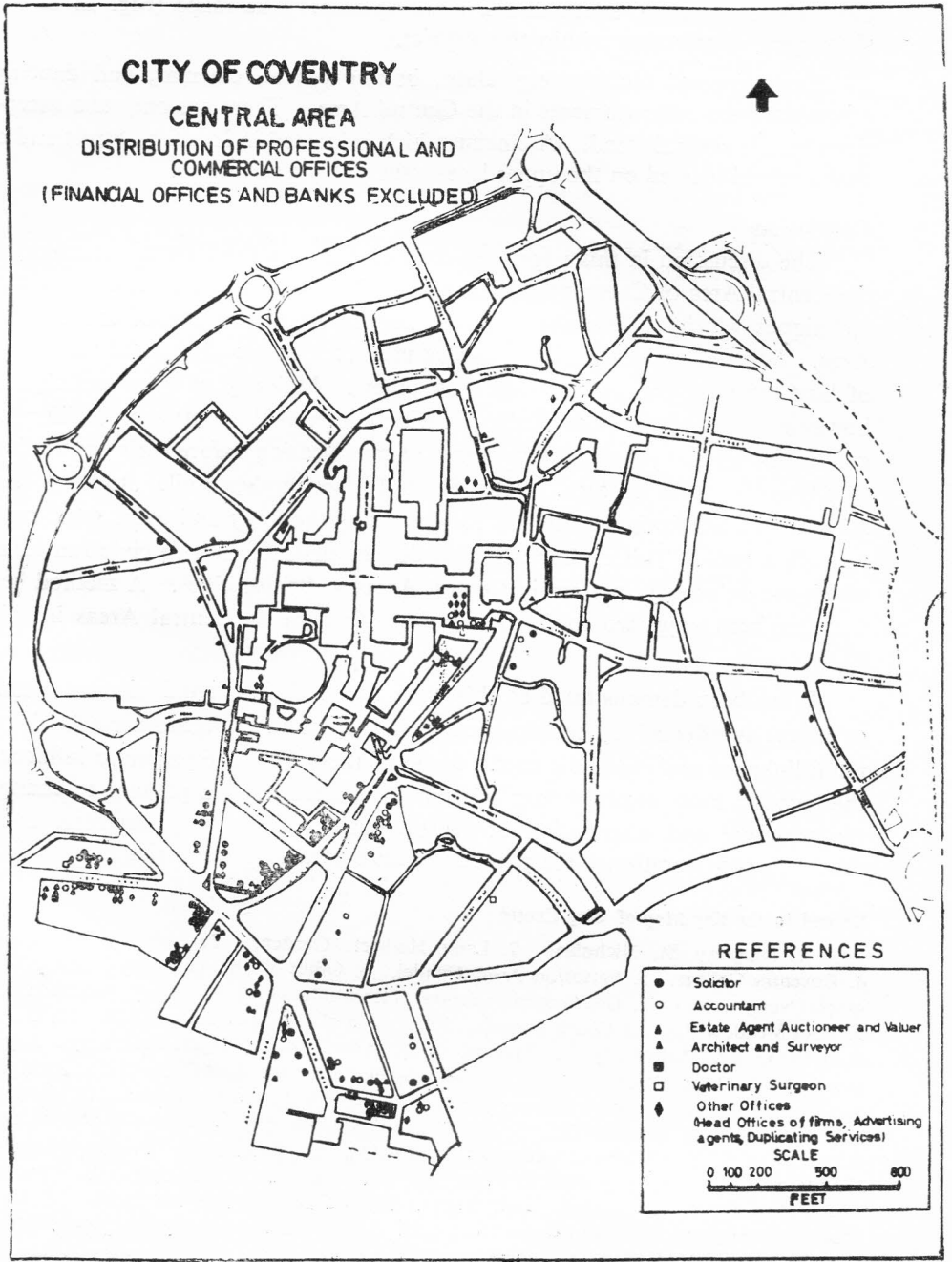
CITY OF COVENTRY
CENTRAL AREA
DISTRIBUTION OF PROFESSIONAL AND COMMERCIAL OFFICES
(FINANCIAL OFFICES AND BANKS EXCLUDED)
REFERENCES
Solicitor
Accountant
Estate Agent Auctioneer and Valuer
Architect and Surveyor
Doctor
Veterinary Surgeon
Other Offices
(Head Offices of firms, Advertising agents, Duplicating Services)
SCALE
0 100 200 500 800
FEET

Fig.14

portion of professional, commercial and financial offices, however are within the main office zone, south of the retailing area. The maps (Fig. 13 & 14) show their distribution within this district.

Entertainment facilities e.g. clubs, betting offices, cinemas, and dancing schools are the outer elements in the Central Area. There are only two exceptions to this general trend. A cinema which is located in Hertford Street and a dance school located on the upper level walk of Lower Precinct.

Conclusion

The discussion in this paper has covered not only the internal structure of the Central Area of Coventry but has also attempted to throw some light on the techniques which analyse the variation between various parts of the Central Area. Some of these techniques can be used to measure the spatial variations of land-use with greater precision than others. Majority of these techniques, however, have evolved from studies, in widely separated countries with different conditions, and may need certain degree of modification before their application to a specified case or area. Peter Scott for example, while studying the Australian CBD devised a method for delimiting the inner and outer retail zone and office zone. This author does not devote any attention to civic functions which are universally present in Central Areas in British cities. A method has therefore been suggested to demarcate the civic zone in Central Areas in this study.

It has been demonstrated by this work that each individual element (retail or office) is affected by factors such as site, space needs, consumer behaviour, retail linkages and economic cost. Some of these have the power to influence the location more strongly than others. Any attempt by a planner to change the structure and distribution of central business functions, therefore, must take into consideration these related factors and associated variables.

Legend to the Key Map of City Centre

1. Ringway St. Nicholas. 2. Lady Herberts Garden. 3. Ringway Hill Cross. 4. Coventry College. 5. Salvation Army Citadel. 6. Office of the Coventry Evening Telegraph (Newspapers). 7. Old Grammar School (14th Century). 8. Coventry Theatre (1937). 9. Pool Meadow Bus and Coach Station. 10. Stage 5 of the Inner Ring Road. 11. Swimming Bath. 12. Multistorey Car Park (above shops for 370 Cars). 13. Sainsbury's Supermarket. 14. Hales Street Triangle (to be redeveloped). 15. West Orchard Car Park (814 cars). 16. Hillman House, 17 Storey Block of Flats. 17. Belgrade Theatre. 18. Amalgamated Engineering Union's Office. 19. St. John's Church (1350 A.D.). 20. Old Bablake School (1560 A.D.). 21. Bond's Hospital (1506 A.D.). 22. Spon Street Townscape Scheme. 23. Mercia House 20 Storey Block of Flats. 24. Lady Godiva Circular Cafe. 25. Coventry Cooperative Store. 26. Locarno Ball Room. 27. Marks and Spencer Store. 28. Hotel Leofric, Broadgate. 29. Owen Owen Store. 30. Gulson Central Library. 31. Holy Trinity Church. 32. Old Coventry Cathedral (1394 A.D.). 33. New Coventry Cathedral. 34. Lanchester Polytechnic. 35. Lanchester Polytechnic (faculty of Art and Design).

36. Herbert Art Gallery and Museum. 37. The Council House. 38. St. Mary's Hall (1342 A.D.). 39. The Garden Island in Broadgate. 40. The Broadgate House (Shops and Office Block). 41. British Home Store. 42. Display Kiosk. 43. Woolworth Store. 44. Two-tier Car Park (190 cars). 45. Retail Market. 46. Craft Road (redevelopment area). 47. Ringway Queen's and Ringway Rudge. 48. The Butts Radial Road. 49. The City Arcade. 50. Multistorey Car Park (493 cars). 51. Hartford Street Shopping prectinct. 52. Ford's Hospital (1529 A.D.). 53. New Council Offices Block. 54. Ringway St. John's. 55. City Police Headquarters. 56. Telephone Exchange. 57. New Three Storey Office Block. 58. The Qudrant (Victorian Houses converted into offices). 59. The Dome Kiosk. 60. Shelton Square Shopping Area. 61. New Greyfriars Link Road. 62. Greyfriars Green Open Space. 63. Copthall House (4 Storey Office Block). 64. Coventry Railway Station. 65. Station Tower (15 Storey Office Block). 66. Park House (4 Storey Office Block).

DETERMINING INDUSTRIAL REGIONS

HASAN GARANEJAD*

Ascertaining the dispersion of industrial activities and regions composes one of the important questions of industrial geography. The first geographer to investigate this subject was the well known Sten de Geer, who delineated the industrial regions of the United States by considering the number of industrial workers. De Geer considered those cities as industrial which had over 10,000 population at least 10% are more of whom were engaged in industrial activities. This criterion is open to criticism from two standpoints: However much of the extent of industrial activities of a city may be correlated with its population, one may nonetheless find cities of less than ten thousand people which are considered industrial.

Also, as we shall see, a number of other factors besides the number of workers come into play here, factors which De Geer ignored in considering this problem. However, his detailed studies relating to the industrial areas of the United States illuminated every aspect of this question. Subsequent to the work of De Geer, in 1936, a geographer named Richard Hartshorne[1] delineated the industrial areas of North America. In his view, those industries which have importance in a given region have at least 1/10 of the workers employed in all other industrial fields. If in a given city, the number of non-local industrial workers reaches at least 5,000, we may classify it as the industrial city. Using this criterion, after the investigator has established which cities are industrial, he may establish the industrial areas.

The first person who made the individual countries of the United States as the basic consideration, was Helen Strong.[2] In delineating industrial areas, her criterion was the difference in number of workers between two areas. Despite her consideration for all industrial activities in her research, since she chiefly considered the production capacity per capita of a state, her researches have a one sided quality. From another viewpoint, she has charted the relation of a country's industrial centralization to the energy country's consumption. Thus, a map of this correlation drawn by Strong resembles a chart of rainfall dispersion.

Strong has considered those countries producing from 100,000 to 500,000 steam horsepower energy as the most concentrated industrial areas. The next category is of countries producing 10,000 to 100,000 steam horsepower.

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The next category is of countries producing less than 10,000 steam horse-power she has treated as non-industrial or unimportant industrially.

Finally, in 1938, a geographer named Wright[3] made the value of regions' products the standard for delineating industrial areas. He accordingly placed circles on a map having diameters proportionate to the value of products. In the same year, a well-known geographer named Clarence,[4] mostly active in economic geography, published an article on this subject. Relying upon the number of industrial workers, energy consumption, and value of products, he made three different maps by dots. He thus overcame the deficiencies of a map designed with only the number of workers considered. In other words, by combining maps charting the three factors, he represented the industrial regions of the United States in an interesting fashion.

New research was conducted on this subject in 1951 by Thompson[5] and a Japanese geographer, M. Miyazaki, relating to the industrial regions of Japan, a map of which indicates every 100 workers by one point. Thus a map which at first glance indicates the geographical distribution of workers, in fact, shows clearly and interestingly the distribution of industrial activities.

In 1957, another Japanese geographer named Kiyuki Koda,[6] following the footsteps of American geographers, made the number of industrial workers per square kilometer the criterion for delineating industrial regions. Thus, localities having more than fifty workers per square kilometer were proposed to be among the industrial regions of Japan. Likewise, localities in which the number of workers reaches 500 per square kilometer are declared to be the principal concentrations of industrial activity. In other words, those same localities were presented as the focus of industrial regions.

Another of these investigations of individual regions resulted in a chart of the attractive power of industries for workers, drawn by Lonsdale[7] for 23 industrial areas of Russia. The investigator, in determining the attraction of industries, used the following formula:

$$M = \frac{E_n + C_n}{2}$$

Where M indicates the power of attraction, E_n the percentage of workers employed by the industries of a given area, in relation to all industrial workers of a region, and C_n the percentage of capital investment in the industries of a given area in relation to all industrial capital investment in a region. In this manner, the investigator delineating distinctly 23 industrial areas of Russia, is able by means of the above formula to ascertain 571 industrial centers within these areas. It must be recalled that the above formula is not applicable in some countries when statistics are not perfect. Moreover those areas the power of

attraction of which is lower than ten are not considered as industrial. Using the statistics published by the Iranian Economic Ministry in 1968, the power of attraction for the provinces of Gilan and Eastern Azarbaijan is revealed as:

$$\text{Gilan:} \quad \frac{1.6 + 1.8}{2} = 1.7$$

$$\text{Azarbaijan:} \quad \frac{4.8 + 31.5}{2} = 18.1$$

A new study by Linge[8] based upon industrial attraction took shape in 1960 and bore upon the industrial activities of Newzealand. The investigator had made the criterion of his work the number of industries and the level of attraction of industries. Furthermore, Linge, in establishing this level of attraction, has given close attention to the number of workers employed in industries, the monthly pay of workers in those industries, and the value of those industries' products.

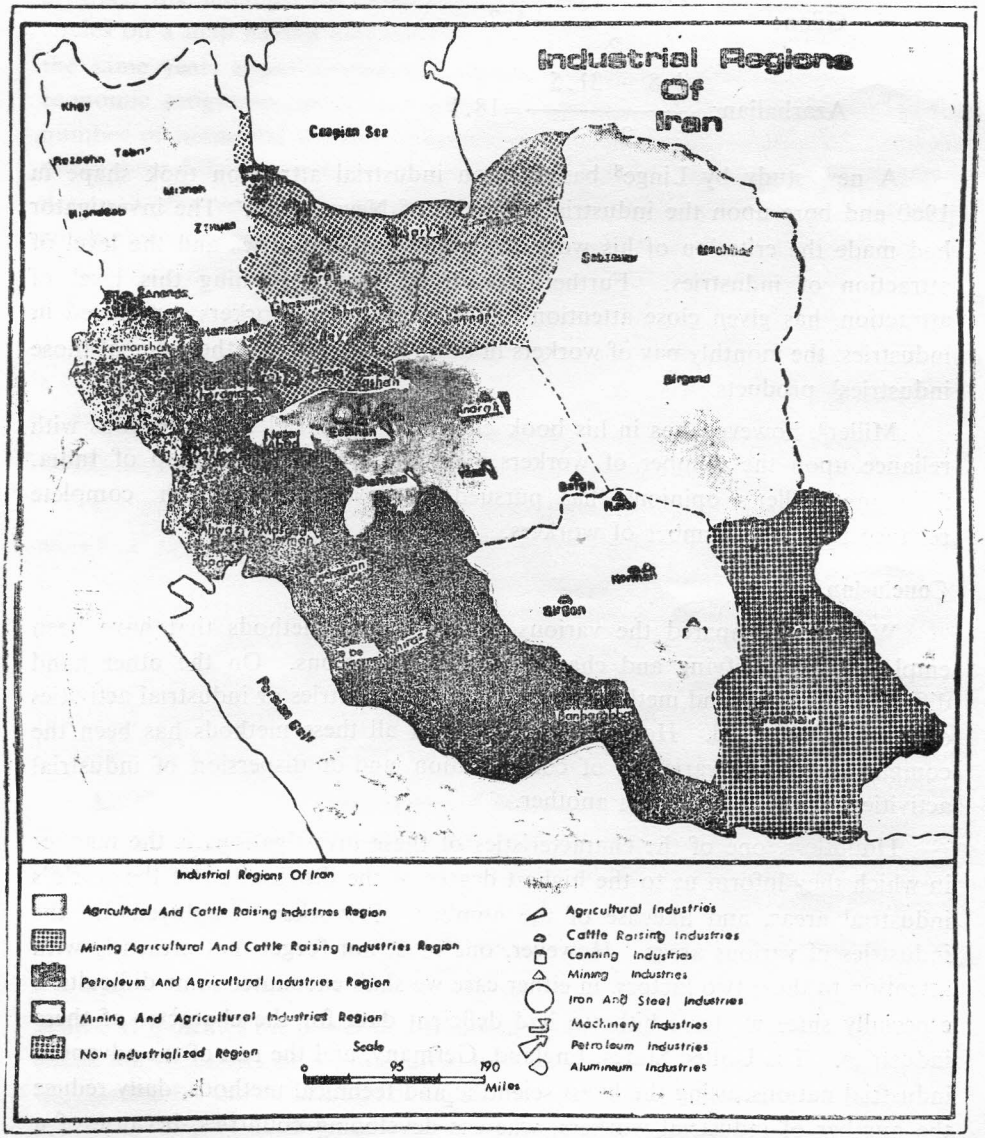
Miller[9], however, has in his book chartered industrial concentrations with reliance upon the number of workers. Karan, in his similar map of India, following Miller's opinions, has pursued his investigations with complete reliance upon the number of workers.

Conclusion

We have compared the various principles and methods that have been employed in specifying and charting industrial regions. On the other hand different principles and methods to evaluate the industries or industrial activities of a region are used. However, the object of all these methods has been the comparison of the variation of concentration and/or dispersion of industrial activities of one region from another.

Doubtless, one of the characteristics of these investigations is the manner in which they inform us to the highest degree of the distribution of the world's industrial areas, and likewise of the number of workers employed in the industries of various areas. However, one must not forget that presently with attention to these two factors, in either case we shall encounter some difficulties, especially since we have hitherto had deficient data for the character of these industries. The United States, England, Germany, and the rest of the advanced industrial nations, using the latest scientific and technical methods, daily reduce the number of industrial workers, whereas developing countries, because of a lack of capital and a swelling population, wish to compensate to an extent for the lack of automation and capital with manpower. It is therefore clear that we must write with a more prudent and scientific regard for the subject matter as we compare two different regions. It must finally be remembered that in deli-

neating industrial regions of developing nations, the best and most rational method observes the value of raw materials ; the value of products ; the level of profits ; the level of capital investment and the number of workers.



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LAHORE: A STUDY IN SPACE AND TIME

M. MUSHTAQ*

The geographical survey of the site and situation of Lahore city illustrate the variety of needs and circumstances responsible for its origin and development. Such circumstances and requirements, naturally have been changing in different periods of history and have successfully moulded the structural form of the city. Perhaps no other city of the sub-continent represents so distinctly different phases of cultural evolution. Here geographical environment, social transformations and changing political patterns have influenced the townscape to such an extent that each major part of the city has become a distinct cultural entity representing a particular period of its growth.

Origin of the City

The early history of Lahore is enveloped in a mist of traditions, conjectures and guesses. It is difficult to deduce any definite conclusions about its earlier name and date of foundation. Definite reference to the town were made by early Muslim geographers and historians. "The mythical founder of Lohawar or Lahore was Lovor Loh one of the two sons of Rama, the hero of Ramayana".[1] He belonged to a race of Rajput rulers who had succeeded in establishing themselves in Western part of the sub-continent in the 7th century of the Christian era. Perhaps they were descendants of royal family of Ajmer. It is believed that Lahore at that time was the capital of one important Hindu principality, which exercised its feudal power over some other states. The importance of Lahore came to light when Muslims entered this part of the sub-continent in the 10th century.

The history of Lahore, as a matter of fact, is obscured to such an extent that it is almost impossible to know the exact date of its foundation. It can fairly be concluded from the ancient writings that Lahore was a town of some importance during the early days of Khilafat i.e. about the middle of the 7th century A.D. Attempts by historians and archeologists have failed to bear any fruit. Therefore it can be safely assumed that city of Lahore was founded as early as the beginning of the second century and became prominent during the invasions of Mahmud Ghaznavi in the beginning of the 11th century.

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1. Latif, S. M., *Lahore*, 1892, p. 1.

History of Development

Hindu Period—1002 *A.D.*—It is very difficult to form an idea of the nature and extent of the city during the Hindu period. There are no records or antique architectural remains of any importance of that period which could yield any evidence about the city. This may be accounted for two reasons: (1) The absence of stone for building purposes in this region and (2) the ruthless hand of the destroyer, judging from the numerous devastating invasions to which the city had been subjected, may have something to do with it.

On the other hand Lahore, unlike Multan (another ancient Hindu centre), the seat for the worship of the great "Sungod" for centuries, have never been known to history as a place where the Hindu deities rejoiced nor was ever held sacred by the followers of Hinduism worthy of pilgrimage. Religious enthusiasm is generally the motive for the construction of religious edifices of more or less importance and durability. Lahore had never been a place of attraction for pilgrims from other parts of the sub-continent. In other word, Lahore was situated in a transitional region between the Hindu dominated India to the East and countries to the west of Indus river, a cradle of northern Buddhism for centuries. Therefore in the absence of any evidence, it is impossible to say anything definite about the old city.

According to some traditions, the neighbourhood of Ichhra was the site of the old city. This name appears on Hundis (native bills of exchange).[1] This is also proved further by the fact that one of the old city's gate-ways bears this name, Lahori Gate, as it points towards this place, as the Kashmiri gate points towards Kashmir and Delhi gate towards Delhi. This new site was definitely chosen by Muslims after occupying the place in 1023 A.D., who at that time were definitely better versed in matters of warfare and strategy than the Hindus.

Muslim Period 1023-1756-57.—The city of Lahore was of little political importance before it was occupied by Sultan Mahmud Ghaznavi in 1023 A.D. Malik Ayaz, a favourite of the Sultan, was left in charge with a garison stationed for the first time in the Indian territories of Ghazni Empire, Malik Ayaz was the first to build walls and fortress.[2] It was the first fortification of this kind in this region by the Muslims.

The city remained the regional capital during the reign of the first eight princes of the Ghaznivide dynasty and was governed by Viceroys. No significant development took place, though the city enjoyed a long peaceful period, until the reign of Masud II (1098-1114 A.D.). The 12th Ghaznivide Emperor (1152-1186) transferred the Government seat permanently to Lahore. The Ghazni Sultans erected some Imperial residences and pleasure grounds. The city was well populated at that time.

1. Latif, S. M., *Lahore*, *op. cit.*, p. 102.
2. Murtza, H., *Hadiqatul Aqalim*, Punjab University Library, Ch. III, p. 146.

After the fall of Ghaznavi dynasty, the city of Lahore was occupied by Sultan Muhammad Ghori. He was succeeded by his General Qutb-u-Din Aibak. He shifted the seat of Government to Delhi, leaving Lahore again a regional capital of the Delhi Sultans. As a provincial capital Lahore did not flourish well. It remained the seat of various governors who often revolted and succeeded to the throne of Delhi and founded several dynasties. The city suffered terrible destruction due to several assaults from Delhi as well as from outside invaders for a long period. The armies of Chenghiz Khan captured and plundered the city in 1218 A.D. Again the Moghals ravaged the city in 1241 and 1261. Due to these successive incursions from the North-West the city was deserted. In 1266 A.D. Ghiyas-u-Din Balban again endured to rehabilitate it.[1]

In 1298 A.D. during rule of Khilzai (Khilji) dynasty, a number of Moghals settled outside the town. The settlement was named as Moghalpura quarters.

In the year of 1524 A.D., during the rule of Lodhi dynasty, the governor of Lahore, being angry with the Sultan, invited the Moghal ruler Babar of Kabul to invade Hindustan. Babar came with a large force and Lahore was captured and plundered.[2]

Thus Lahore was again separated from Delhi. After two years Babar again came back and after the famous battle of Panipat, fought on 29th April, 1526, decided the fate of India and so was founded the Moghal Empire.

Before Moghal Empire was founded, no doubt, Lahore was of much importance from political and strategic points of view, but never showed any sign of significant development in and around the city. With the exception of few villages like Moghalpura, Ichhra, and Mian Mir in the suburbs, the town was mostly confined to the walled area. There were a number of gardens along the river banks owned by the feudal lords of the city. In fact during the 500 years of Muslim rule nothing was developed to leave behind any architectural features which could help to give an idea about the nature and extent of the city.

Indeed Lahore is essentially a Moghal city. It was not until the Moghals became the masters of the country that the taste for urban building sprang up. The first stimulus to art, architecture and horticulture in the city came from their keen sensibility of beauties of nature, vividness and vigour of their imagination and brisk-lively temperament.

To create beauty in every aspect of life was a natural taste, a part of character and temperament of Moghals. They were lovers of nature, natural scenes and successfully created beautiful land-scapes in the form, especially, of gardens decorated with structures of exquisite design and beauty. This appreciation of

1. Latif, S. M., *Lahore, op. cit.*, p. 16.
2. Erskin, *Memories of Babar*, London 1826, p. 28.

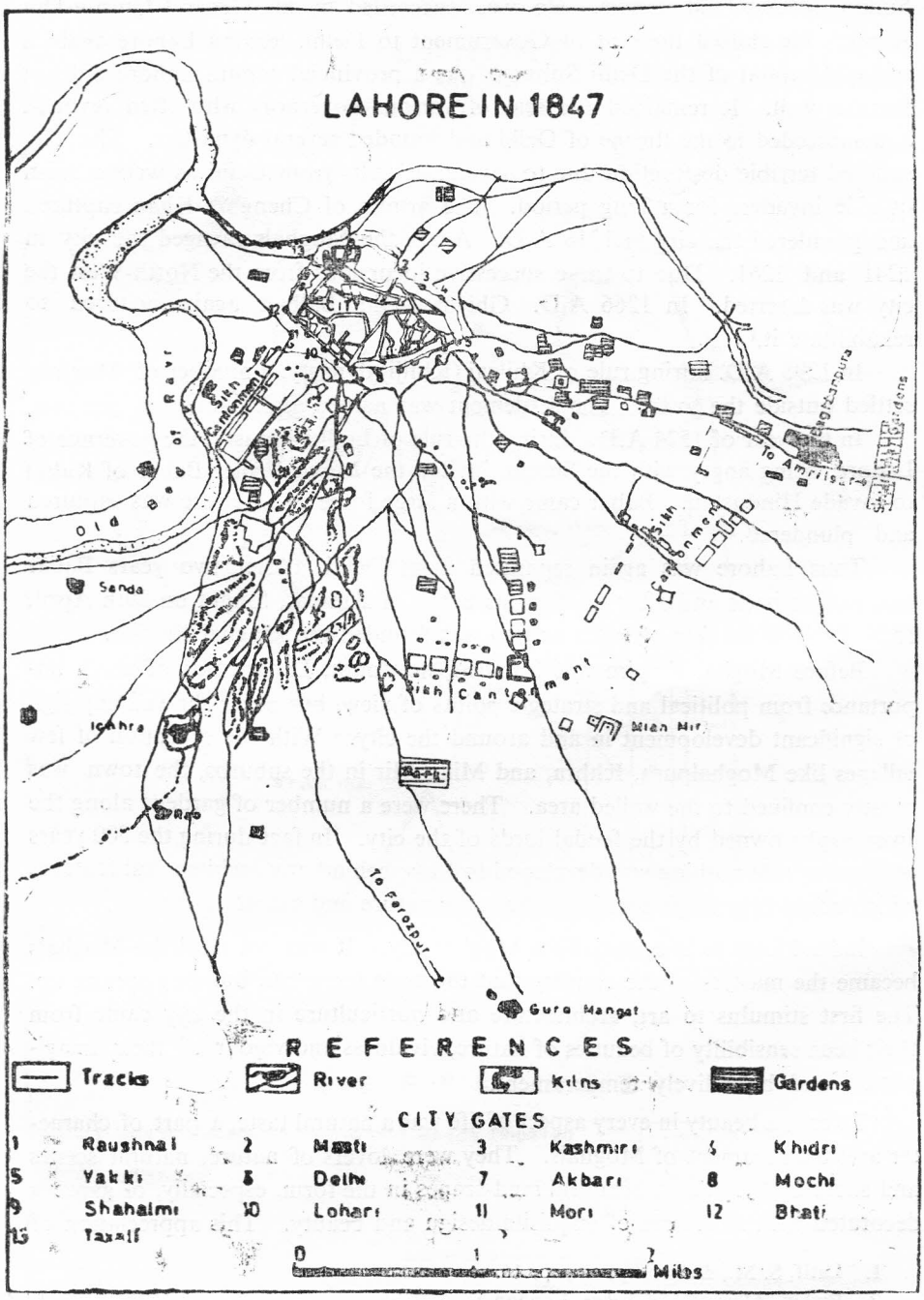
LAHORE IN 1847
CITY
Old Bed of Ravi
Sikh Cantonment
Shahdara
To Amritsar
Shalimar Gardens
Sikh Cantonment
Sanda
Ichhra
Mian Mir
Dera
To Ferozpur
Guru Mangat
REFERENCES
Tracks
River
Kilns
Gardens
CITY GATES
1 Raushnai
2 Masti
3 Kashmiri
4 Khidri
5 Yakki
6 Delhi
7 Akbari
8 Mochi
9 Shahalmi
10 Lohari
11 Mori
12 Bhati
13 Taxali
0
1
2
Miles

Fig. 1

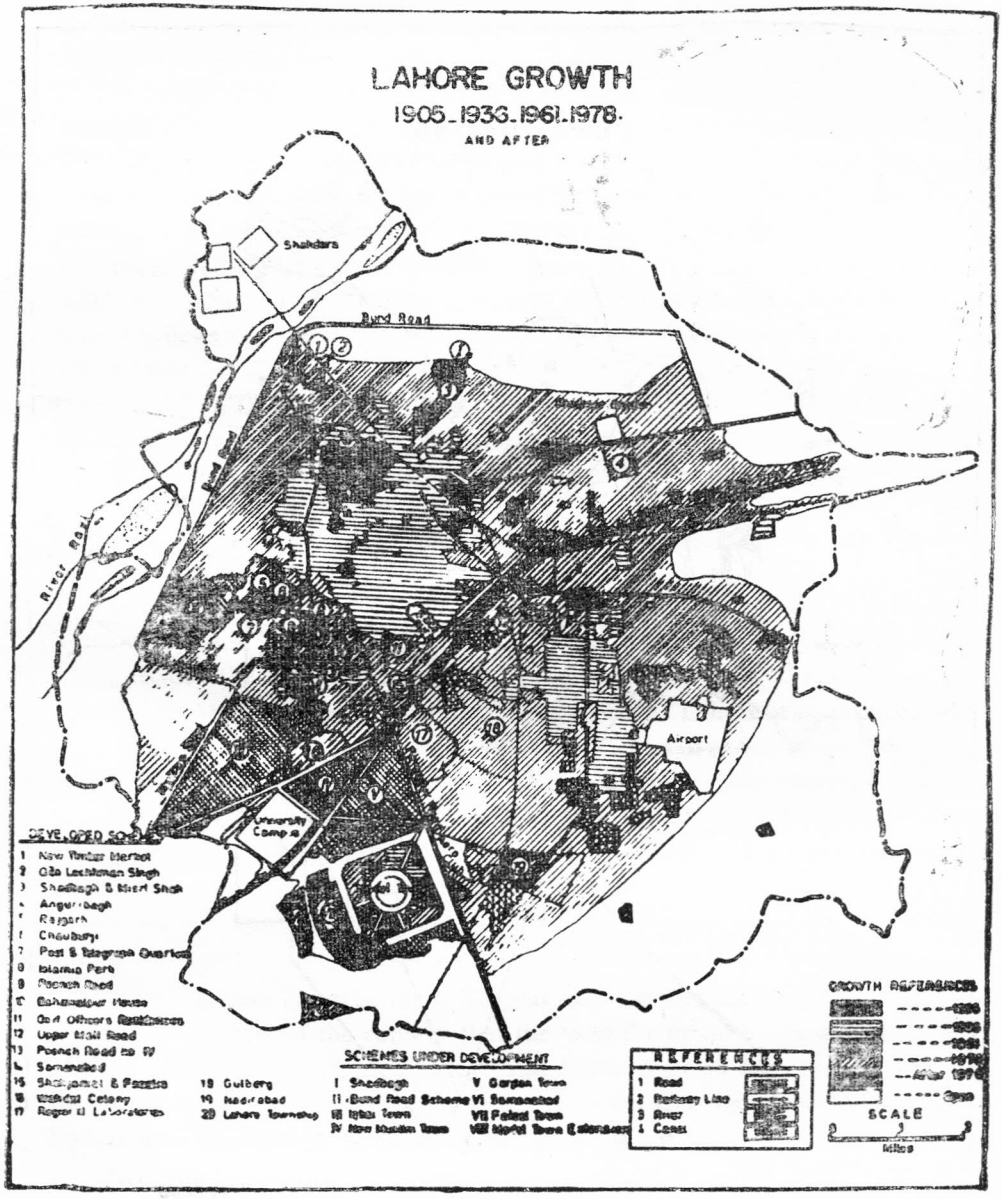

Fig. 2

natural scenery, combined with solitude for the preservation of the dead, which was a special characteristic of Moghals, led to the erection of numerous garden enclosed tombs, which form a picturesuqe feature of the suburbs of every Moghal city.

The first place of importance to benefit from the establishment of the Moghal

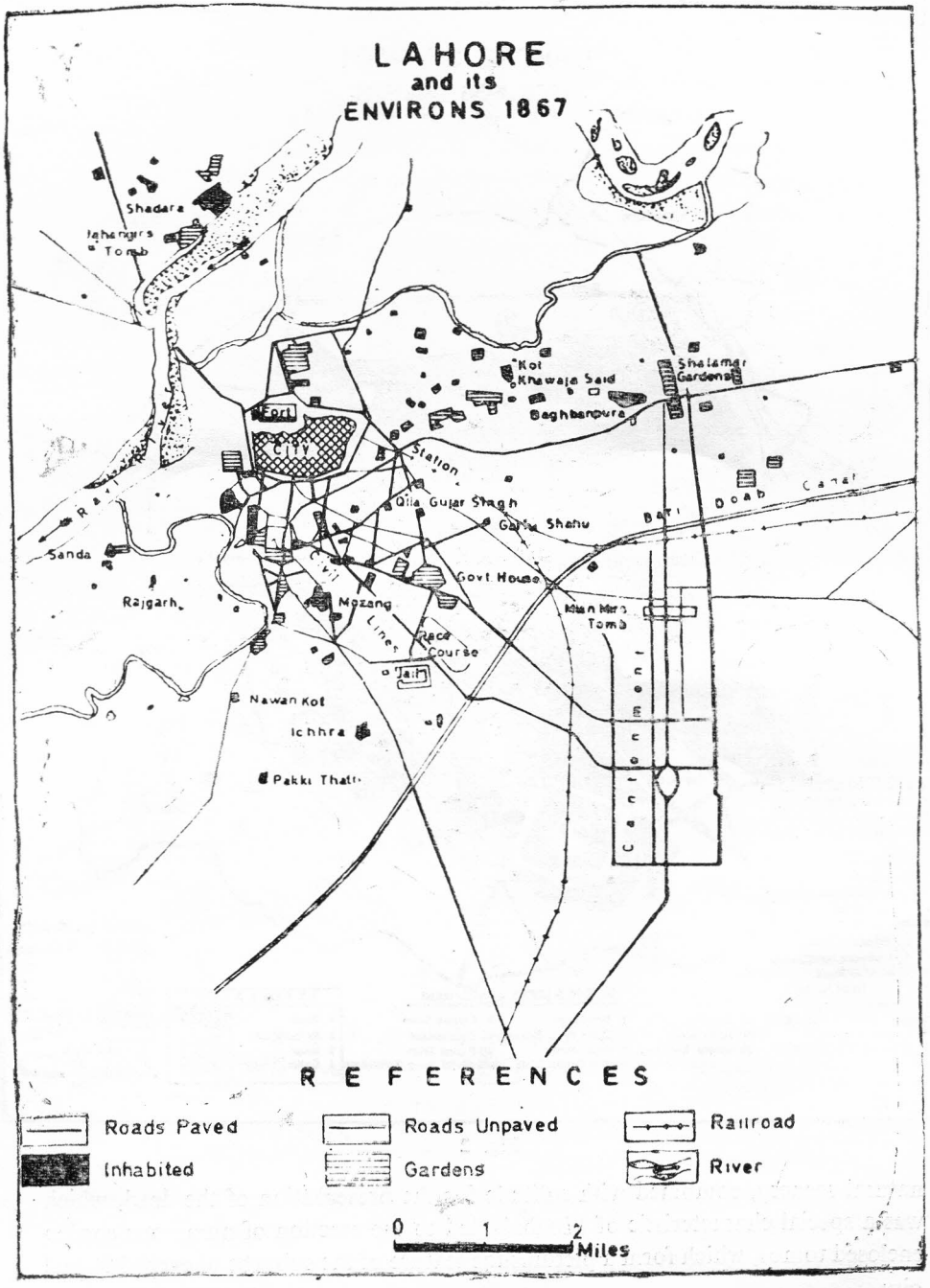
LAHORE
and its
ENVIRONS 1867
Shadara
Jahangirs Tomb
Kot Khawaja Said
Shalamar Gardens
Baghbanpura
Fort
City
Station
Qila Gujar Singh
Garhi Shahu
Bari Doab Canal
Sanda
Civil Lines
Govt House
Rajgarh
Mozang
Race Course
Jail
Nawan Kot
Ichhra
Pakki Thatti
Cantonment
REFERENCES
Roads Paved
Roads Unpaved
Railroad
Inhabited
Gardens
River
0 1 2 Miles

Fig. 3

Empire in the Punjab, was naturally Lahore. Prince Kamran, one of the sons of Babar, was the first to give impulse to architectural adornment of Lahore. He built a palace with a spacious garden extending from Naulakha, the present city railway station, to the River Ravi on the eastern side of the city. He also constructed a Baradari (a summer house) amidst a garden across the river, which has been partially destroyed by the river. This pace of development in the city was interrupted for a short period by Sher Shah Suri, who had driven out the Moghals from India in 1540. Humayun reconquered India in 1554 and soon after his death was succeeded by his son Akbar. It was Akbar's reign during which Lahore started to achieve grandeur. The reign of Mughal Emperors Akbar, Jahangir, Shah Jahan and Aurangzeb (1556-1707), is regarded as the golden age in the history of the city of Lahore. The city became a place of royal residence. Gardens, tombs, mosques, serais and pavilions sprang up in every direction. The population increased, the suburbs grew, until the city became "the resort of people of all nations",[1] and celebrated for its fine buildings and luxuriant gardens. An impetus was given to the architecture of the country quite unsurpassed in any period. The trade of city flourished and wealthiest people of the sub-continent resided at Lahore, who conducted trade with foreign countries.

The city in those days covered a large area. As far as the population is concerned, it did not gain the splendour and magnificence of Moghal period until the establishment of Pakistan in 1947. The city at that time was divided into 36 guzars or quarters and only 9 were included within the area of the city in 1860 A.D.[2] It is probable that in its best days, that is during the reign of Shah Jahan (1628-1658), the city must have had a circumference of 16 or 17 miles.

Emperor Akbar had kept Lahore as the Imperial capital of the empire for fourteen years (1584-1598). During this period extensive suburbs were added to the city. Political stability and security had immensely increased the trans-continental trade from which Lahore benefited more than any other city of India. The Emperor encouraged gardening and gardeners were brought from Iran and Turan. They cultivated vine and various kinds of melons. The manufacturing skill of woollen carpets were introduced together with that of brocades.[3]

Akbar died in 1606 and was succeeded by his son, Prince Saleem as Jahangir, to the throne. He was very fond of Lahore. He fixed his court here in 1622. Various additions were effected in the palaces and gardens, like Anarkali and

1. Abdul Fazal, *Ain-i-Akbari*, Vol. II, p. 152.
2. Latif, S. M., *Lahore*, op. cit., p. 193.
3. Abdul Fazal, *Ain-i-Akbari*, Vol. II, p. 152.

Del-Awez. When he died at Rajouri, in Kashmir, in 1627, it was his express wish that he should be buried at Lahore. He was buried, accordingly, in the Del-Awez gardens at Shahdara. A mausoleum, one of the chief ornaments of Lahore, was erected to his memory by his son Shah Jahan. Later on tombs of Asif Jah and Noor Jehan were also erected in the spacious Del-Awez gardens.

The city of Lahore had a monopoly of trade in the sub-continent. It handled great traffic in goods and visitors who followed the ancient highways. But in the 17th century the sea trade was well established between Europe and the East. Trading posts had been established all along the East African coast and along the coast of Southern India, which carried out trade on a large scale and inflicted a deadly blow to the expensive land trade. Companies like the East India Company and others owned by French and Portuguese, were actively engaged in trade. But still the conditions for Lahore, in the beginning of the 17th century, in trade were not bad as described by Thomas Roe an Ambassador.[1] Only about 10 years later the trade of the city had died.

Thus the emergence of sea trade had proved fatal for the trade of the city. The ancient channels of trade had dried up, when Shah Jahan succeeded his father Emperor Jahangir. Yet the splendour of Lahore had achieved its greatest height in the reign of this Emperor. A canal, the present Lahore branch of upper Bari canal, was excavated to supply water for the Imperial gardens and numerous others possessed by the Omeras and for irrigation of crops.

Lahore enjoyed an interval of amazing prosperity under the munificent rule of Ali Mardan Khan, the most able and reknowned engineer of the time and Hakim Ali-u-Din as governors between 1628 and 1657 A.D. During Emperor Shah Jahan's reign, Lahore, though no longer remained Dar-u-Lukumat,[2] was still a place of importance. The city lay on the route of the imperical marches to Kashmir and was an arsenal and redezvous of the Armies despatched to Balkh and North-Western frontier. Lahore, therefore, maintained its size and beauty. The imperial palace was enlarged, the tomb of Jahangir, the gardens of Shalamar, the Gulabi Bagh, the Idgah (mosque), gardens of Zeb-u-Nissa and tombs, which lined the road between Anarkali and Shalamar gardens, were the main works of this period.

At the time of accession of Emperor Aurangzeb in 1658 A.D. Lahore had declined in wealth and splendour. The establishment of court at Shah Jahanabad had drawn away the bulk of artificers and nobles. The trade had been diverted to the sea ports which caused the desertion of the trade highways, so vital for the prosperity of the city. At the same time massive armies remained engaged in campaigns in Southern India, hence removing a source of flourishing business

1. Foster, Sir W., *The Embassy of Sir Thomas Roe to India*, London 1926, p. 446.
2. The capital was Shah Jahanabad, the present Old Delhi.

for the city. The above mentioned facts were responsible for the decay which had started in the city despite the fact that Emperor Aurangzeb took interest in the welfare of the city. He constructed the Jamia Masjid and established a college attached to it. He also built a Bund which saved the city from being destroyed by the river.[1]

The city of Lahore, as a matter of fact, at its height of prosperity, covered a large area. The guzars were the most populous suburbs of the inhabited city beyond the walls. The suburbs constituted a faintly extensive part of the city. Later on the negligence and unpredictably heavy rains, which is the character of the climate of this region, accelerated the decay and ruin of the buildings as reported by Birnier.[2]

The whole empire was plunged into chaos after the death of Aurangzeb in 1707 A.D. The North-Western passes, the "gateways" to India for invaders, were left unguarded, which revived the process of invasions once again. Nadir Shah Durrani and Ahmad Shah Abdali invaded through these passes. Ahmad Shah invaded India 8 times and successfully crushed the Marhatta power for ever at Delhi after the famous battle of Panipat in 1761. The Sikhs emerged from the vacuum as a new power. They devastated the country and suburbs of Lahore, until they became the masters of the city in 1767.

Sikh Period 1767-1840.—From the death of Emperor Aurangzeb, until the establishment of the Sikh Kingdom in 1804 by Ranjit Singh, Lahore was subjected to periodical invasions, pillage and depopulation; and thus was reduced from a mighty city to a little more than a walled township encircled by a ruinous waste. Quarter after quarter became deserted. The wealthy residents of guzars relinquished their extramural palaces and retired to places of safety. The merchants and traders fled to other parts of the country. At length the inhabited portion of the city was confined to an area surrounded by the wall originally raised by Emperor Akbar, outside was ruin and devastation.

Maharaja Ranjit Singh brought stability and peace to the city after crushing the numerous sikh chiefs. He tried to restore the Shalamar gardens and added a few monuments, entirely at the cost of the existing ones. He laid a ruthless hand on the most beautiful buildings to get marble and other stones with which they were adorned. Some of the mausoleums like that of Zeb-u-Nissa Begum, the daughter of Emperor Aurangzeb, which was unique in design and beauty, and wholly made of marble, were totally ruined. The numerous gardens were laid desolate. Several buildings were pulled down simply to get bricks to restore the city walls and residences of Sikh Omeras. This aspect of the city's desolation is described by a British officers who visited Lahore in 1808.[3]

1. Travernier, J. B., *Travels in India*, London, 1889, Vol. I, pp. 94-5.
2. Birnier, F., *Travels in the Moghal Empire*, London, 1826, Vol. II, p. 121.
3. Thornton, T. N., *Lahore*, 1876, p. 110.

A similar account is given by Edward Fane, who accompanied the British Commander-in-Chief to Lahore on the marriage of Prince Naunehal Singh in 1837.[1]

East India Company 1848-1857.—Anarchy returned to the city after the death of Ranjit Singh in 1839, after a relatively long peace of nearly 35 years. This state of confusion continued until the occupation of the Kingdom of Lahore by the East India Company in 1848. John Lawrence became the first Chief Commissioner of the territory in 1853. He has also testified the deplorable condition of the city.[2]

***1851-1852 and 1852-1853, relating to the Administration of the Punjab Territories**

The new administration took immediate steps for the welfare of the city. The Anarkali, then a Sikh army cantonment, was vacated and new cantonment was established at Mian Mir in 1853. Under the new administration peace and security returned to the city and confidence was restored amongst the population. Widespread agitation against the foreign rule in the sub-continent resulted in the transfer of the Company's rule of India to the British Crown and the Chief Commissioner become the first Lieutenant Governor of the region and thus started the British period.

It is from 1858 onward the city entered the field of progress and development after a very long period. Before this, as is clear from the map (Fig. 1) the city was confined to the wall. The environs were dotted with villages like Mozang, Nawan Kot, Qila Gujar Singh, Ghari Shahu, Baghbanpura etc. The condition of the paths, as the planned roads did not exist, was very bad and that of the drainage was worse. The map shows the condition of the area covered by the city.

Immediate steps were taken to improve the conditions in the city and in the surrounding debris-covered areas. The whole city area was surveyed and a plan for a new civil station and roads was drawn up in 1859. The problem of accommodation was acute as only historical places were available for offices as well as for residences of the officials. By the end of 1860 some of the administrative offices and other important buildings had been erected. The major roads between the city and cantonment had been paved. The roads connecting other paths, like the Grand Trunk Road, Ferozepur Road and road leading to the north west across the Ravi River, were also partially paved. Spacious bunglows, with gardens, were laid down in the new Civil Station. The Civil

1. Fane, H. E., *Five Years in India*, London, 1842, Vol. I, p. 185.
2. Lawrence, Sir J. Selection from the Records of the Government of India (Foreign Department) for the year 1851-1852 and 1852-1853, relating to the Administration of the Punjab Territories.

Secretariat was completed in the Anarkali garden around the tomb of Anarkali. The Government House was completed in 1859 by making additions to the beautiful mausaleum of Muhammad Qasim Khan, a cousin of Emperor Akbar, on the Upper Mall Road. The General Post Office was also completed and this has since been expanded successively to meet the growing demand. The Telegram Office, opposite to General Post Office, was completed in 1881. In short the city had started to grow out from its centuries old shell. The map (Fig. 2) above the environs of the city in 1867. The whole surrounding area is covered by tombs and gardens for a long distance. The planning of a new site, due to the presence of several obstructions, mainly due to religious buildings, was very difficult. The new government could not take any risk of offending popular religious sentiments as it had done in 1857. Therefore, the Civil Station was established as well as it could be in the presence of all the tombs and other religious structures. By the end of the 19th century various government buildings had sprung up in the Anarkali and the Civil Station had become well populated. The city of Lahore save a rapid development in its communication, both railways and roads because of its being the centre of most important frontier province, which in past had seen several onslaughts of armies through the passes in the North-Western mountain ranges. Special attention was paid to this problem and immediately cantonments were established at the foot of the mountains to guard the passes. The cantonments were provided with good rail as well as road communications. These roads focused at Lahore and then proceeded to Delhi. The development of roads in and outside the city brought about a remarkable change in the physical growth of the city. In 1862 railway line from Delhi was extended to Lahore and in 1865 it was connected with Karachi. In 1875 railway line from Lahore crossed the river and connected Peshawar. The only bridge was the railway bridge and it had also a road passing over it. The commencement of railway traffic brought a revolution in the means of communications from which this city benefited most. It brought a great stimulus to trade and commerce, which, in turn produced a change in the economic and physical pattern of the city. By the end of the 19th century Lahore had become the focus of the railways of the province and the principal junction of the North-Western railways system.

With the growth of traffic, both in goods and passengers, the necessity to provide various kinds of facilities like godowns, offices residences, maintenance workshops and marshalling yards, also arose. Railway colonies were established to provide accommodation to the officials of the rapidly expanding departments. The railway yards and workshops were also established. The locomotive and carriage and wagon shops were established in 1874 and were provided with residential accommodation.

The development of an efficient and rapid transport system resulted in the increase of mobility and trade of the city. A large number of traders migrated from other parts of India and once again became an important collecting, distributing and exporting centre for agricultural produce, the output of which was revolutioned by the advancement of irrigation by perennial canals. In fact the economy of the province was totally changed when vast semiarid tracts of land were brought under the plough. This brought a boom to the city and development was accelerated enormously at the end of the 19th century. This can be noticed by comparing the maps of the city for 1847, 1867 and 1905 (Figs. 2 & 3) respectively.

As the number of prosperous people grow, better class houses also started appearing on a large scale. Lahore municipality was created to guide the expansion of the city in a planned manner by the Punjab Government in 1887. The urban field of the city was also growing rapidly and schools, colleges, hospitals, dispensaries and other useful institutions were appearing in the city in a large number.

The government also set up an Improvement Trust to effect various remedies for the sanitation and improvements to historical places. Sanitation, in fact, was one of the main problems of the city. The residents used to suffer from various kinds of plagues and epidemics due to inadequate drainage and defective water for drinking from the shallow wells.

Industries, on the other hand, in the city could not flourish. The most important industrial feature of the city was its printing presses. They were established to meet the educational and other needs of the city and the province. The 19th century did not see any other industries arise in the city.

Lahore saw a great change in its functional structure and urban field within a short period of 40 years. The extension of better suburbs, like Gwalmandi and Ramgali, was going at a fairly fast rate. A large business community, a community of government officials, the university and college teachers, doctors and other professionals, like lawyers and advocates, had been an important constituent of the city's population. The desire and demand for better residences was on the increase.

IRANIAN AGRICULTURE AND ITS DEVELOPMENT*

AHMAD MUJTAHEDI**

In the two decades between 1953 and 1973 the rapidly growing industrialization of Iran has shifted to industry much of the former emphasis on agriculture during the last five years of the period, the share of agriculture in the GNP. declined from somewhat under 25 per cent to 16 per cent.

Despite its decreasing part, agriculture in 1972/3 was still responsible for the largest portion of consumer expenditure, and agricultural products. Notably such traditional items as carpet, dried fruit and nuts continued to rank next below oil as Iran's largest exports and so were the second largest provider of the country's foreign exchange.

Although the proportion of rural inhabitants in the total population has fallen, their actual number has increased because of the high birth rate 3 "per cent per annum" out of the whole population of 2, 6.8 million in 1967/8, 16.6 million or 62 per cent lived in rural area; in 1972/3, when the number of people had increased to approximately 31 million, about 18.8 million or 57 per cent lived in such areas:[1]

In the same five years, the active agricultural population had gone down from 49 to 40 per cent, and despite a government forecast for a considerable increase in farm employment, a decline actually took place:[2]

A chief reason for these changes was found in the ever swelling migration from the rural area to the cities, more marked in Iran than in many other countries, and directed primarily to the capital, Tehran in 1972/3 approximately 16 per cent of all the population from one place to another and over half of that percentage went from rural to urban area.[3]

The largest number of people moving to the cities from the countryside or from smaller towns consisted of active workers in search of employment or higher earnings.

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*Annual Report and Balance Sheet, Bank Markasi Iran the Central Bank of Iran. 1351, (1973) p. 65.

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1. Population Forest up to 1970, Iran center of statistics publication no. 209, 351 (April-21, May-21, 1979), see also annual report bank markasi (1351) 1973 p. 93.

2. *Ibid.*, and fourth national development plan 1968-1972, the imperial government of Iran, plan organization, Tehran, Iran, 1968, p. 69.

3. *Ibid.*, p. 93, N. 3.

As a large proportion of industrial establishments are located in Tehran, it became a lodestone for hopeful workers.

The limitations imposed on agricultural production by physical factors are clearly of great importance and require examination.

South and east from Azarbaijan run the great mountain zones of the Zagros and the Alburz enclosing between them and the Makran and Afghan mountains a central region of high basins and ranges. Recent, orogenesis and structural contortion together with prolonged erosion and detrital accumulation have produced ruggedness and steep slopes on the one hand and low-gradient basins on the other. The resulting landscape with its preponderance of abrupt angular junctions is frequently picturesquely impressive but has obvious difficulties for farming.

Iran is the meeting point of air masses of varying characteristics. The outward facing masses of the northern and western mountains receive, by orographic action, some winter precipitation from the weak and variable frontal activity arriving from the Asia. Upper atmosphere convergence produce some winter precipitation on the central basins and ranges.

Except for gulf littoral, the Makran coast and the Caspian coastlands this precipitation falls on mountains and high plateau basins where altitude reinforces the winter drop in temperature. The season of maximum precipitation over highland Iran is therefore relatively or absolutely bleak. Agricultural activity is reduced to a minimum; and of the seasonal water-balance surplus intəq mountain much is lost either in direct run-off or in rapid snow melt runoff in spring. Relative winter harshness also serves to restrict the crop-range, although this general pattern is broken up by the multitude of differing micro-climates produced by variation of altitude, slope and aspect in the more dissected regions. Along the Caspian shore the shelter provided by the Alburz and the thermally stabilizing effect of the Caspian sea together result in generally humid and mild conditions which nevertheless even here are periodically broken by cold air incursions.

In the summer the Zagros, Central and southern Alburz and the central area have general air-mass in stability, but land heating turbulence can produce violent changes in temperature and precipitation very similar to these experienced on the Spanish Meseta. The northern Alburz and Caspian receive orographic precipitation from the frequent movements of humid air from the Caspian lowlands, while Makran and the Gulf experience generally weak but sometimes catastrophic monsoonal effects.

The climates of Iran are cleary restrictive of farming. Everywhere except in a few areas along the Caspian shore very definite seasonal rhythms tend to

encourage reliance on annual crops, particularly of grains which require vernalization and which have short growing seasons. Violence and variability particularly affecting precipitation are also climatic factors of great significance.

Supremely important of course is the availability of water for plant, animal and human life. For Iran, as for the Middle East as a whole, the Qur'anic verse "We made from water every living thing"[1] is as true today as ever.

Rain-fed agriculture, as can be deduced from the brief statement above and from the preceding study of climate is poorly productive and hazardous in all regions. In central Iran the reported yields of dry-farmed wheat,[2] on about 30 per cent of the tilled area, vary between 290 and 360 kg per hectare (c. 2½ cwt. per acre) as compared with between 850 and 1,900 kg per hectare (c. 6-13 cwt per acre) on irrigated land. In arid Sistan and Baluchistan the yields of dry-farmed grain are so low and variable that practically none is produced except in some small favoured mountain areas.

The relatively pluvious regions of Azarbaijan and Kurdistan and the Caspian littoral have a smaller proportion of irrigated arable land, generally. c. 20 per cent, but the differences in yield between dry and irrigation farming remain considerable. In these regions, as in the semi-arid east, centre and south, precipitation variability is great. Fluctuations in time, type and quantity are all significant, and when thermal seasonality, so often exaggerated by altitude and its aspect, also produces critical conditions for crop plant germination and maturation, then precipitation variability can make dry-farming extremely hazardous. Even in near-tropical Khuzistan, killing frosts can occur as late as April.

Reliance on wasteland grazing under such climate conditions is catastrophically dangerous. The only available estimates suggest that, on average, during one year in every five a total of between 800,000 and one million head of sheep and goats perish in drought conditions.

The greatest losses are suffered by the nomadic pastoralists of the southern Zagros and Baluchistan, many of whom are periodically reduced to destitution by the not infrequent decimation of their flocks. In 1962 and 1963, thousands of once-proud Baluchi tribesmen were forced away from their mountains to meagre relief and begging in Zahidan and Zabul, and spread as de-tribalized migrant casual labourers throughout eastern Iran, producing in their wake dislocation of the labour market and secondary poverty – this following a four-year absolute drought between April 1958 and April 1962.

The direct consequences to agriculture of climatic harshness and hazard are equalled by the indirect effects operating through the whole hydrological,

1. The Qur'an XX, 31.
2. First National Census of Agriculture, *op. cit.*

edaphic and biotic complex. The most extreme conditions are found south and east of Kirman, where the total average rainfall for between two and four years (8-24 in) not infrequency falls in one or two days of violent storms.[1] Occurrences less extreme only in degree are recorded regularly in all parts of Iran, under such conditions and associated also with great diurnal and seasonal temperature conditions, weathering produces on all slopes a preponderance of coarse detrital matter in situ together with graded concentrations of fine sand and silt in the lower basins of interior drainage. Runoff rates become extremely high on all sloping land, and water holding capacity (in any case low on the thin and slowly formed soils) has been dangerously reduced by encroachments on forest and scrub by the plough and livestock.

Flood damage in the plains is estimated at more than one million U. S. dollars annually.[2]

Downstream siltation adversely affects groundwater and drainage conditions, water-supply installations and soil formation. Upstream in the catchment areas the effectiveness of precipitation is reduced in some cases to 10 per cent of the actual fall, and land which in the absence of cultivation and grazing possessed a dry forest or mountain steppe ecological stability is often reduced to pebble-desert or gullied badland.

Biotic conditions for agriculture may then be summarized as follows. As water balance studies show the regions of moderate mean water surplus are restricted to the Zagros and Alburz mountains, the Caspian littoral, the highlands of Khurasan and the isolated mountains of the interior. Even here the lower lands such as those in the lake Rezaiyeh (Urmiyeh) basin and the valleys of the Araxes (Aras) and upper safidrud are areas of deficit. The mean surplus, such as it is, everywhere "occurs in one season alone."

In these regions and on their peripheries are found the best potential edaphic conditions for cultivation relatively deep forest soils and considerable expanses of fairly mature alluvial material, and also the least ephemeral natural grazing.

Even so, winters are frequently thermally harsh and snow common, seasonal summer aridity, particularly when associated with high day temperatures results in a precarious ecological balance for natural climax tree growth. On the steep slopes, predominantly in permeable rocks this balance is very easily destroyed by even the most cautious intrusion of agricul ture as any

1. Khuzistan Regional Development Programme, *Eleventh Quarterly Review*, June 1960.

2. Multi-purposes River Basin Development, Flood Control Series, No. 18, U. N. Publication 61, II, f. 8.

traveller in the Persian highlands can observe the contrasts between controlled forest and the ruined soils and degenerate flora of grazing and ploughed land.

In all other areas the mean water deficit is medium to high. The production of grasses for grazing is not reliable..... Virtually all the water required for agriculture must be supplied artificially; almost none is available from precipitation, practically all the water used in the zone of great deficits is obtained from outside the region."[1]

Climatic, ecological and hydrological conditions in the regions of seasonal water surplus impose stringent controls, on the use of such water in the deficit zones. As noted elsewhere, river volume is highly variable and surface flow most often ephemeral. Storage and control of flow is made even more difficult and costly by the heavy load of solids carried by streams in spate. Since most surface water flows into interior drainage basins geomorphological processes normal under these conditions have produced since late tertiary times a near-ubiquitous type of complex physiographic feature which is of common enough occurrence in semiarid regions, but which is of especial importance to Iranian agriculture.

The environment in which both the upland and plain dwelling agriculturalist has to operate is thus extraordinarily limiting. Dry-farming is clearly climatically hazardous and tends to be only of importance in the relatively pluvious mountains and hill-lands which have their own special problems arising from the enforced use of frequently immature, steep slope soils of mechanical and chemical instability the only exceptional region is that including Mazandaran and Gurgan, the former as a result of relative climatic benignity[2] the latter because of the special characteristics of deep loess soils. Here annual, perennial and forage crops give good returns even without irrigation; and for an explanation of the present less than maximum exploitation of land in Mazandaran and Gurgan one must turn attention away from simple physical controls.

Irrigation farming can only be carried out successfully under some stringent conditions on the valley terraces and floodplains in the seasonally pluvious mountain one finds the following general situation.

Mountain rivulets and streams provide water for irrigation, being deviated by canals to both sides of the valleys. In these higher zones the density of cultivated lands relative to available land is much higher than in the lower plain

1. Thornthwaite, Mather and Carter, "Three Water Balance Maps of South-West Asia", publication of *Climatology*, vol. XI, No. 1 Centerton, New Jersey, 1962.

2. Irrigation Project-Mazanderan "Preliminary and Full Reports to Organization of Iran" by Sir Alexander Gibb and partners, 1958.

or piedmont zone's complicated water works conduct the water to minute fields and terraced agriculture is often of an ingenious kind. The work of generations has shaped the sedentary agricultural landscape and drop diversification exists together with an important fruit growing complex. These zones suffer most from shortage of land and the distance to market centres.[1] In the high valleys and terraces of the northern Zagros and Alburz ranges, in the isolated central mountains at Tezfrj-an, and on Kuh-i Taftan in Baluchistan, as everywhere in the highlands of the middle East, lushness and fertility seem to dwell accentuated by contrast with the low plains. It is important however that the visual impact made by the rows of poplar, the groves of almonds and apricot and the steps of terraced fields with their variety of pulses, legumes and vegetables should not deceive the traveller into believing that rustic plenty abounds.

Even that intensity of Production which exists has been developed only by strenuous uncosted manual labour which has to be expended more and more prodigally as growing populations impose increasing strains on the inexorably restricted resources of topographically usable land, here lies the paradox of apparent plenty and real poverty.

With the introduction of land reform and the white revolution during the years of third and fourth plans, the institutional frame work for agriculture was transformed.

The change was brought about primarily by land reform, and various other of the twelve points of the white revolution such as nationalization of forests and water resources, and the formation and activities of the education, the health and the development and extension crops. The establishment of numerous, better financed, and more up-to-date rural cooperatives and joint stock farming corporations also provided bases for new forms of agricultural development. Although land reform, the "white revolution" in general, and the development of the cooperatives and joint corporation movements are beyond the scope of treatment here and have been discussed in detail elsewhere,[2] they must be mentioned because of their importance to agricultural growth during the third and fourth plan periods and their relevance to the future.

Despite the speed with which land reform was activated from its initiation under the inspiration and leadership of Shahenshah in 1962/3 it led way through the next three years to the other reforms and Iran development.

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1. "A study for the modernization of peasant life and animal husbandry in the Zagros." Memorandum to plan organization of Iran by Italconsult, 1960.

2. Among the many discussions, see esp. Ann S. Lambton, the Persian Land Reform, 1962-1965 Oxford Clarendon Press 1969, *passim*.

The reform provided that henceforth no owner would be allowed to possess more than one village and required him to sell to a farmer sharecropper any lands on which he had been working up to that time. Except in a provision for bidding sub-division of land transferred to new owners, the reform of 1962-3 did not involve consolidation of plots even for efficiency or mechanized farming.

Production of selected agricultural crops "thousand tons".

	1347 (1969)	1348 (1971)	Growth Rate 1348 (1971)	4th Plan Target 1351 (1973)
Wheat	4,400	4,200	—4,5	4,700
Barley	1,204	1,100	—8,6	1,135
Rice (in the husk)	1,354	1,395	3,0	1,400
Sugar Beet	3,403	3,500	2,9	4,500
Cotton (raw)	435	480	10,3	600
Tea (green)	79	75	—5,1	120
Sugar Cane	453	475	4,9	800
Oil Seed	10	32	220,0	130

Source: Plan Organization and Ministry of Agriculture.

The second phase of the reform, applying to landlords owing less than one village, at third required land to be leased to the workers under a thirty year contract, later changed to a requirement of sale instead of rent. From 1969 on, most land reform activities and financial transactions of the new farmers were concerned primarily with these sale and with problems of payment for them. By 1972-3 it was reported that 787 1,000 farmer households had become owners of their land.

Various observers think that a disproportionate share of funds and technical aid have been used for a small number of the rural people and that the land reform advocates claim greater accomplishment than has really taken place. The leading student of Iranian land reform, and K. S. Lambton, has summarized its important effect differently, indicating that whenever the former peasants received land under the reform they soon came to realize that it was their own and thus they began to diversify crops and increased the use of fertilizers markedly.

In most of the land reform villages, furthermore, the new farmer claimed the foreselling of crops and his indebtedness resulting in reduced crop production. Of the approximately 18 million hectares of crop land in the country. Only about one third is actually in use at a given time, while the rest lies

fallow. In the past, attention was reveted on securing greater productivity from each unit. It is only in the most recent years that serious attempts have been made to renew the soil and increase productivity by more irrigation, fertilizers, better seeds, machine plowing and other modern farming techniques.

Despite such action during the fourth plan years, yields per hectare of most crops were lower than the world average and still lower than the average for developed countries, in that year ADF I reported that the factors responsible for the low yields were the inadequacy of investment in intrastructure for production, the high costs of production, insufficiency of research and lack of enough extension services[1] chiefly because of the low yields and high production costs, the prices of most Iranian farm products have increased alone, and with the international prices generally.

1. Lambton, *Persian Land Reforms*, p. 358.

POPULATION CENSUS OF PAKISTAN 1972

The first ever population enumeration on scientific lines in the Indo-Pakistan dates back to the year 1881. The first population census of Pakistan was undertaken a few years after independence in 1951 and the second in 1961. Both the censuses suffered due to shortage of trained and skilled manpower, lack of interest on the part of enumerators, as well as inaccurate responses of illiterate respondent and the non-availability of computer facilities. The result of 1951 and 1961 censuses had been questioned from both coverage and content view point. The third decennial population census was held in September 1971. Unlike previous censuses, the thitd population census was completed in three phases, namely: (1) Big count: (2) Census Evaluation Survey (CES): and (3) Housing, Economic and Demographic Survey (HED).

The Census was carried out from September 16th through the 30th September 1972. The date of 16th September, 1972 was treated as the census date and all references to residence etc, were made as of that date.

Census Organization

The Government of Pakistan appointed a Census Commission as head of the Census Organization of the Ministry of Interior, Government of Pakistan carried out the third population census programme. The census was taken in each province, it was coordinated and supervised by the provincial Directors of Census. For this work each province was divided into census districts. In each Distt. Assistant Commissioners, Revenue Assistants, Sub-Divisional Officers and Tehsildars/Mukhtiarkars worked in addition to their duties were responsible for the organization and enumeration within the census district on part time basis.

The census field work was carried out by charge superintendents, Circle supervisors and Enumerators. The officials of revenue administration supervised and assisted in rural areas local bodies staff in urban areas. Most of the enumerators were selected largely from school teachers, Patwaris, Qanoongos and the local persons of the enumeration blocks.

The census evaluation survey was the joint responsibility of the Census Organization and the statistical Division, which has trained field staff consisting of Statistical Officers, Statistical Investigators and Enumerators who are located in 11 district headquarters throughout the country.

Field staff of 900 Enumerators, 130 Field Supervisors and 30 Statistical Officers was recruited for undertaking field enumeration of the Housing, Economic and Demographic Survey, whereas the permanent field staff was entrusted with the planning of field work training and supervision of the new recruits.

Planning and implementation of the CES and HED Surveys was the responsibility of a special cell of the Statistical Division. Well staffed with statisticians.

The processing of data collected in the big count, the census Evaluation Survey and the HED survey was carried out on an IBM Computer 360/30 installed in the Statistical Division.

The data processing Section of the Statistical Division undertook programming, systems designing and the preparation of tables using IBM Computer.

The Census

The 1972 population census was a complete count of all the people living in the country and covered each and every person living within the boundaries of Pakistan. Foreign nationals living in Pakistan were also included, Pakistan nationals living outside Pakistan temporarily or were away from Pakistan during the whole of the census period were separately enumerated under special arrangements made with the Pakistan Diplomatic Mission abroad. Unlike previous censuses the third census deals with only a few characteristics of population. The data includes the following information: name, relationship with the head of household, age, sex, marital status, religion, literacy and nationality. For the first time a book type household enumeration schedule was used instead of the individual population census schedule of the 1951 and 1961 censuses.

Big Count

Complete enumeration of population, called Big Count was completed in two parts. The first operation consisted of numbering the structures and in the second operation all persons living in the listed households were eunmerated.

Census Areas

The whole country was divided into primary census units called blocks which were grouped into census circles and these in turn were grouped into census charges. Similarly, groups of census charges formed census districts. One census Block consisted of approximately 150-200 households. A village smaller than this size was treated as a census block.

Numbering the Structures and Household Listing

Using the locality map Enumerator, familiarised themselves with the boundaries of the census block and inspected the entire area its buildings, houses, huts, and prepared an inventory of a house, building, hut, boat, mosque, temple, shed, tent or any such place which is useable for human habitation. Each structure was then enlisted in register serially and painted on the structure.

Within each structure all individual units meant for residential or other purposes were listed on the listing register. Each unit was examined for to occupancy and the name of the head of the household was listed in the register and each household was given a serial number within a census block.

The enumerators then interviewed with any adult member of a household and collected the required information.

Provisional Results of Big Count

The census organization released the provisional population for the country in four provinces including 19 cities having a population of more than 100 thousand.

Census Evaluation Survey CES

The principal objectives of the CES were to estimate the number/proportions of population and households missed in the big count; to work out adjustment factors for "Missed persons" sex and age groups; to estimate response variance in respect to all items included in the big count: and to analyse the sources of error in the Census.

The design of the CES sample was based on a probability sample of approximate households drawn through a two-stage, stratified, random sampling technique. The entire country was divided into two Sub-Universes. Sixteen large cities were grouped together to form sub-universe I and the remaining country was included in Sub-Universe II. Rural tribal areas of the North West Frontier Province were excludes from coverage. Eighty-two primary sampling units which consisted of census circles were selected from sub-universe I. In all, 167 clusters of approximately 30 households formed the secondary sampling units.

In Sub-Universe II, 82 primary sampling units were also selected from which 82 clusters of approximately 30 households were selected. The overall probability of selection was constant 1/800 for Sub-Universe I and 1/600 for Sub-Universe II.

Locality	Area	Population 1972			Variation 1961-72		Proportion 1972-census
		Both Sexes	Male	Female	Number	Percent	
	42,880,000	64,892,000	34,417,000	30,475,000	22,012,000	51.33	100.00
Northwest Frontier Province	5,631,000	8,402,000	4,376,000	4,026,000	2,671,000	46.60	12.95
Centrally Administered Tribal Mreas	1,847,000	2,507,000	1,291,000	1,216,000	660,000	35.73	3.86
Federal Capital Territory of Islamabad	94,000	235,000	130,000	105,000	141,000	150.00	0.36
Punjab Province	25,488,000	37,374,000	19,871,000	17,503,000	11,886,000	46.63	57.59
Sind Province	8,367,000	13,965,000	7,474,000	6,491,000	5,598,000	66.90	21.52
Baluchistan	1,353,000	2,409,000	1,275,000	1,134,000	1,056,000	78.04	3.72

The total population of Pakistan was 64.9 million in September 1972 registering an increase of 51.33% over the 1961 census. The breakdown of the total population by different administrative boundaries in Table No. 1.

CES Methodology

The Census Evaluation Survey consisted of the following steps:

1. An independent re-enumeration of each CES sample area was made by filling in a Re-interview form for each household.
2. A household by household, person by person match was made between the CES enumeration and the census enumeration undertaken manually in Karachi. Then each household and each person was determined to be a "match" or a "non-match" case. The matching operations have almost been completed.
3. For all "non-match" cases, transcription of the required information into field follow up forms was made.
4. A followup survey was made by personal interviews to establish the correct status of the household/or person at the time of the Census.
5. Information on the coverage status of each household/person was then coded.
6. Tabulation of results.

The first phase was started after the first three weeks of the census operation and was completed in about three months time. The follow up survey was started in the month of January and took about 4 months to complete Housing Economic and Demographic (HED) Survey.

This survey was conducted in the third phase. The main objectives of the HED were:

1. To obtain data on housing and housing conditions;
2. To collect data on literacy, type of education and educational level attained, the labour force and its characteristics, migration, marital status disability, and demographic items not covered in the Big Count.

Estimates were prepared for the medium and large districts of the provinces by urban and rural areas. Estimates for small districts are shown for urban and rural areas combined.

A stratified, two stage sample design was adopted. A list of census blocks, structures and households prepared during the 1972 census constitution the sample frame. The overall sampling rate of 1/20 and 1/50 was fixed for urban and rural areas respectively, the overall sample size was 300,000 households.

A specially recruited field staff was trained. Enumeration of the sample areas commenced on the first of August 1973 and was completed within four months.

The completed HED data is now available in 5 volumes.

Census Reports

1. Bulletins: One Bulletin containing provisional population figures by districts was released in 1973.

2. District Census Reports: Released in 1978 contain a brief introduction to the District.
3. Population tables include information at Districts. Tehsils/Talukas level and for urban localities.
4. *Village lists* include population informations about individual village.
5. *Census Reports of Tribal Areas.*
   The reports are similar to the District Census Reports.
6. Census report of the islamabad Federal Territory:
   This also is similar to the District Census Reports.
7. Volume I: This includes the population census report and Tables for Pakistan showing population statistical and tables with brief explanatory notes.
8. Volume II to V (Provincial): A separate volume has been issued for each of the four provinces of Pakistan which contain tables for each province and its Divisions, Districts, Tehsils and Talukas.

List of Distt. Census Reports

1. Mardan District
2. Hazara District
3. Sanghar District
4. Karachi District
5. Dadu District
6. Peshawar District
7. Hyderabad District
8. Loralai District
9. Chagi District
10. Kharan District
11. Quetta Pishin
12. Zhob District
13. Khairpur District
14. Swat District
15. Makran District
16. Kalat District
17. Lasbella District
18. Nawabshah District
19. Jacobabad District
20. Chitral District
21. Dir District
22. Bannu District
23. Sukkur District
24. Larkana District
25. Tharparkar District
26. Sibi District
27. D. I. Khan District
28. Malakand District
29. Thatta District
30. Kohat District
31. Gujrat District
32. Gujranwala District
33. Campbellpur District
34. Lahore District
35. Sialkot District
36. Sheikhupura District
37. Sahiwal District
38. Mianwali District
39. Bahawalnagar District
40. Bahawalpur District
41. Multan District
42. Muzaffargarh District
43. D. G. Khan District
44. Rahim Yar Khan District
45. Rawalpindi District
46. Islamabad District
47. Jhang District
48. Sargodha District
49. Lyallpur District.

ANIS AHMAD ABBASI

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