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THE DEMOGRAPHY OF THE CORN BELT OF THE NORTH AMERICAN MIDDLE WEST

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CHAPTER SEVEN

THE AGE, SEX AND MARITAL COMPOSITION OF THE CORN BELT POPULATION

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CHAPTER SEVEN

THE AGE, SEX AND MARITAL COMPOSITION OF THE CORN BELT POPULATION

While the cultural and employment composition of the Corn Belt population were shown to be of significance as factors influencing population distribution and density, their influence on population growth was indirect. In the case of the age, sex and marital composition, however, the demographic significance is more direct in that these constitute the chief determinants of natural increase and population growth. It is the purpose of this chapter is describe the major contrasts and differentials in the age, sex and marital composition of the Corn Belt and to examine the functional relationships between these characteristics and socio-economic factors which in turn throw light on other demographic matters, especially the significance of migration.

1. THE SEX COMPOSITION OF THE CORN BELT POPULATION

The sex composition of a given population is expressed as the "sex ratio", that is, the number of males per 100 females. In 1950 for the entire United States the sex ratio was 97.6, but this average figure concealed extraordinary variations in the sex ratio according to

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certain differentials. In the case of the Corn Belt the important differentials have been found to be those of time, age, race, type of residence and migration. Moreover all these differentials tended to be inter-related and the spatial variation in the sex ratio was a function of these complex inter-relationships. Accordingly these differentials will be considered separately and then the overall variation in the sex ratio analysed in the light of the significant causative factors.

The Trend in the Sex Ratio

In analysing the trend in the sex ratio, that is the time element as a differential feature, reference is made to selected states. The states have been selected so as to provide a traverse across the Corn Belt and take into account the westward movement of the frontier across the Corn Belt. The trend in the sex ratio in the states of Indiana, Illinois, Iowa and Nebraska from 1880 to 1950 is tabulated below and illustrated by Diagram 12.

TABLE 52

THE TREND IN THE SEX RATIO IN SELECTED CORN BELT STATES, 1800-1950, TOTAL AND NONWHITE POPULATION

	TOTAL POPULATION							
State	1880	1890	1900	1910	1920	1930	1940	1950
Indiana	104.3	103.2	104.1	105.1	103.2	102.8	101.3	99.0
Iowa	109.1	108.5	107.7	106.8	104.4	103.2	102.0	100.0
Illinois	106.4	106.3	105.1	106.5	103.9	103.1	100.0	98.1
Nebraska	124.3	117.7	112.7	111.0	107.6	104.1	102.1	101.8

DIAG. 12.

THE TREND IN THE SEX RATIO 1880 1950 — SELECTED CORN BELT STATES

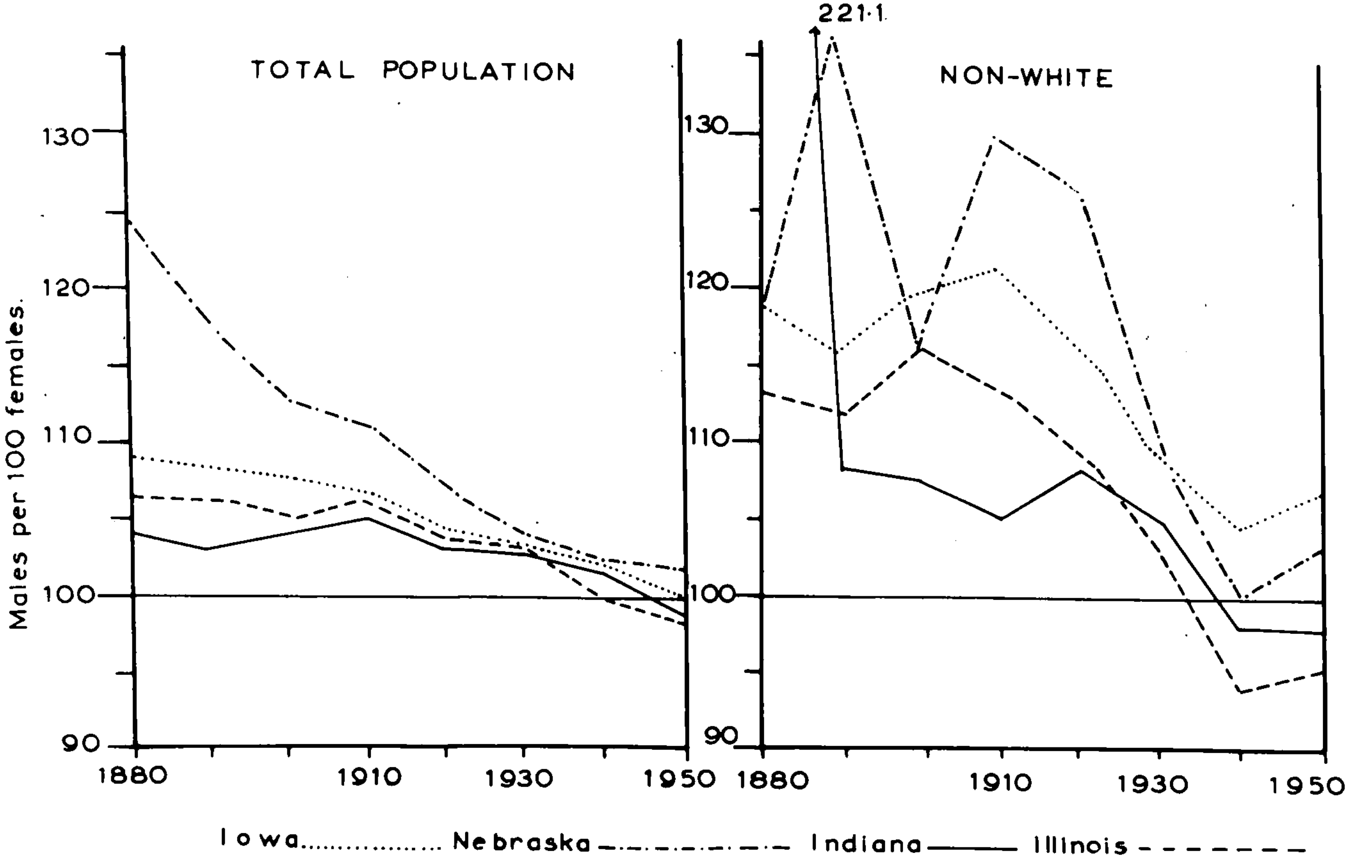

TABLE 52 CONTINUED

	NONWHITE POPULATION							
State	1880	1890	1900	1910	1920	1930	1940	1950
Indiana	221.1	108.3	107.4	105.0	108.2	104.8	97.8	97.9
Iowa	118.9	116.0	119.7	121.5	116.5	109.1	104.8	106.8
Illinois	113.1	112.0	116.3	113.2	109.1	103.0	94.1	95.1
Nebraska	117.8	136.1	116.1	129.8	126.5	109.2	100.0	103.4

Source: U.S. Census of Population, 1950. Vol.ii. Characteristics of the Population, Table 16.

From Table 52 and Diagram 12 it is apparent that the overall trend has been a decline in the sex ratio. There have been obvious variations in the different rates of this downward trend in the selected states. In particular some distinction must be made between the trend in Illinois and Indiana and that in Nebraska and to a lesser degree, in Iowa. In the case of Indiana and Illinois by 1880 the days of the frontier period with its marked male predominance had passed. Both states had been settled and it was shown in Chapter Three that by 1900 a large number of small towns existed. The sex ratio remained fairly stable until 1910, probably due in part to the significance of foreign immigration with a male preponderance, but by 1930 the sex ratio had passed below 100. In considering this trend it important to realise that these states were the earliest occupied and by 1950 were the most urbanised of the Corn Belt. This contrasted sharply with the trend in Nebraska, which in 1880 had only just experienced the frontier and early settlement phases, and moreover had received a higher proportion of foreign immigrants with a high sex ratio during the settlement phase. However with the passing of the frontier the sex ratio immediately fell and the fact that in 1950 it was still above 100 will be shown to be related to the predominantly rural nature of the state. Iowa occupied an intermediate position between these two extremes. Like Nebraska it has experienced a continuous decline in the sex ratio but not at such a rapid rate. This was probably related to the earlier settlement of Iowa and the greater proportion of urban population.

In the case of the nonwhite population difficulties of interpretation appear. The nonwhite populations were relatively small in Iowa and Nebraska, particularly at the early census dates. The general trend until quite recently has been for a marked preponderance of females. This has been variously explained by the high predominance of negro females at birth and the higher mortality rate of negro males. It may be also in part related to the marriage of mulatto males with white females and registering their race as white. It seems likely that there are many variables peculiar to the negro sex ratio, and that these are both social and biological in nature.

Differentials in the Sex Ratio by Type of Residence, and Age Group

One of the major differentials in sex composition is that based on residence and within these differences between the major residential groups are further contrasts as between the various age groups.

Diagram 13[78] illustrated the sex ratio of the same four selected states classified by type of residence and also subdivided on a basis of age group. An analysis of Diagram 13 suggested the following conclusions:

1. A high sex ratio was characteristic of the age group 0 - 14 years, with the rural farm ratio consistently highest and the urban ratio consistently lowest. The chief factor in the high sex ratio in the early years is known to be the sex selective differential birth rate in favour of males.

2. In the age group 14 - 19 years there was a pronounced decrease in the urban sex ratio and an equally marked increase in the rural farm sex ratio. It is suggested that this divergence represented the movement of females from rural areas to towns at the age of first employment. The rural non-farm trend tends to coincide with that of the urban. This was probably related tc occupational differences.

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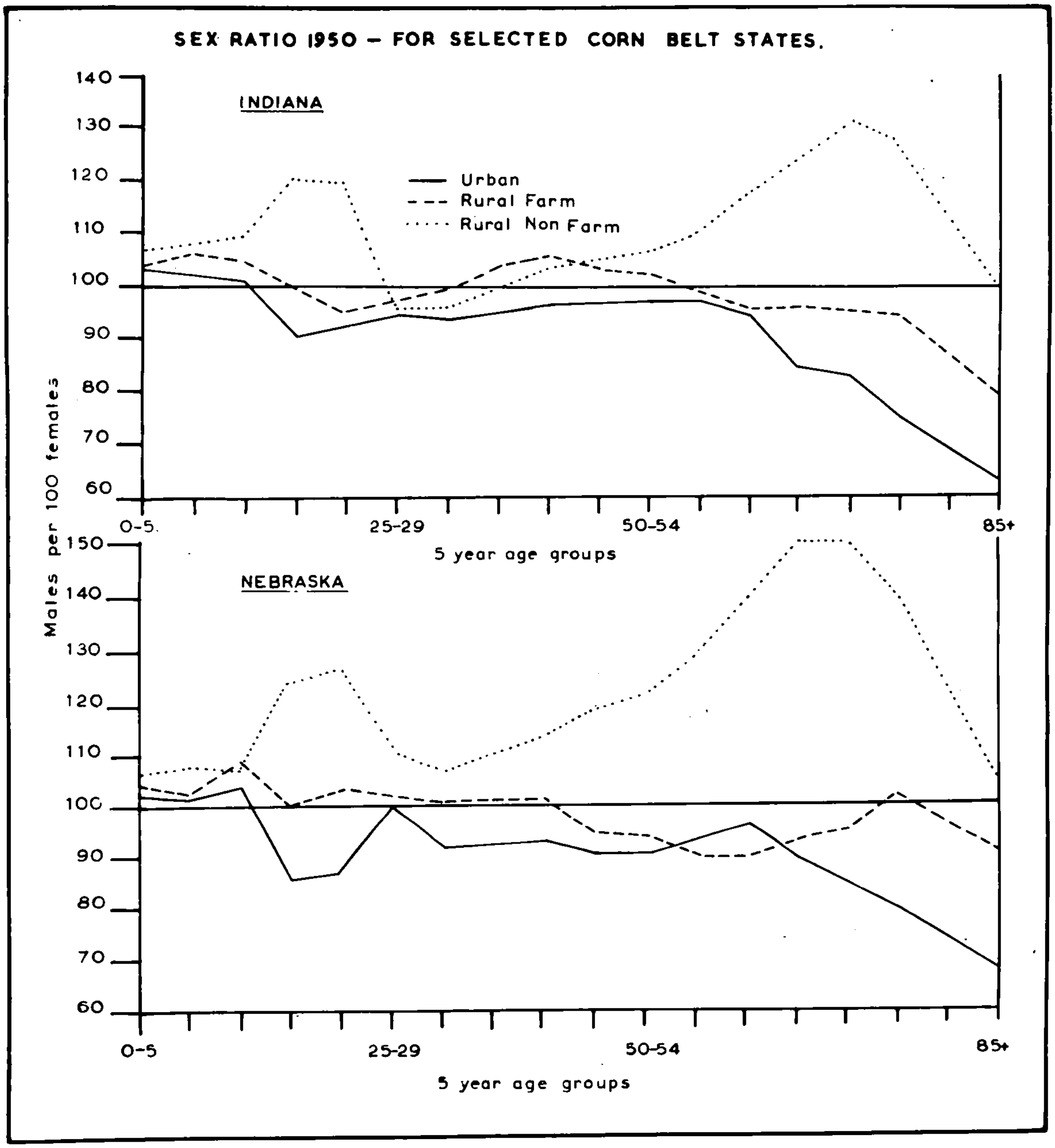
[78] Diagram 13 calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population, Table 15.

DIAG. 13.



SEX RATIO 1950 – FOR SELECTED CORN BELT STATES.

Whereas agriculture is predominantly a male occupation opportunities were less restricted in the case of the rural non-farm with its concentration in proximity to towns and in the suburban fringe.

3. This trend towards a divergence was moderated in the age group from 25 - 50 years. This may be explained by many factors including the return of rural military servicemen to urban rather than rural residence thus increasing the sex ratio in towns, or by a tendency for males to migrate at a later age to urban centres than in the case of females. It may also in part be due to the return of rural-born females to rural areas on marriage.

4. The later age groups revealed further differences between the urban and rural groups. The general trend was for a vast decline in the sex ratio which may be attributed to differential mortality rates. There were marked contrasts by residence in the age at which this decline in the sex ratio occurred. The decline was first evident in the urban group at the age of 60 - 64 years. In the case of the rural non-farm there was a tendency for the decline in the sex ratio to be delayed until the age group 70 - 74. In the rural farm case the trend was quite contrasted. The sex ratio actually increased considerably until the age 70 - 74 years at a

level as high as 140. This may be due to the retirement of rural farm women at an earlier age, especially in the case of widows, and a movement to suburban or urban residence. The same characteristics decline in the sex ratio after the age 70 - 75 years was apparent in the rural farm group and may be attributed also to the differential mortality rate.

It is apparent from a consideration of the selected states that there were important differentials in the sex ratio on a basis of residence and that these differentials were exerted at different ages in the different residential groups. These contrasts may be elaborated on the basis of a wider sample. Diagram 14 indicates the dispersion of the sex ratios of selected urban and rural areas of the Corn Belt. Column A indicates the sex ratios of the urbanised areas of the Corn Belt, which are tabulated by Table 53 in the Appendix. Columns B and C indicate the rural non-farm and rural farm populations respectively on the basis of a 5% sample.[79]

Column A shows that in the case of the urbanised areas of the Corn Belt the sex ratio in 1950 was almost exclusively below 100. The median value was 93 and the inter-quartile range was from 93 - 96. The urbanised areas

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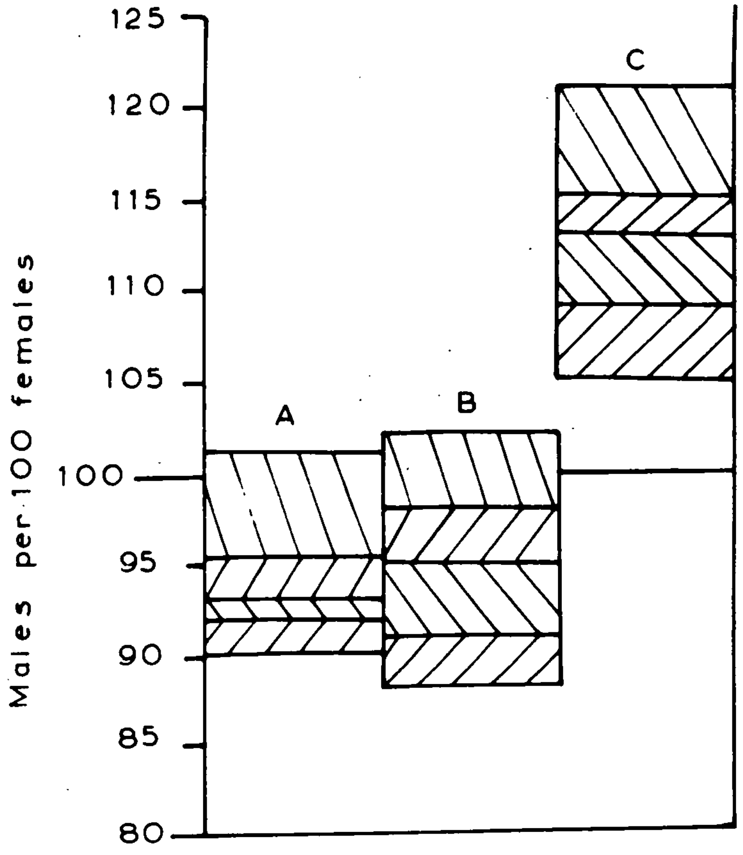
[79] In order that the rural samples should be representative counties with high proportions, over 40%, of rural farm and rural non-farm were selected.

DISPERSION DIAGRAM OF SEX RATIOS FOR SELECTED URBAN & RURAL SAMPLES 1950



A Urbanised Areas
B Rural Non Farm. 5% sample
C Rural Farm. 5% sample

therefore showed a marked predominance of females, which in the case of the evidence in Diagram 13 above was shown to involve all age groups over 15 years. Table 53 in the Appendix also indicates the nonwhite sex ratio in the urbanised areas where the nonwhite population was significant, and in all cases this group too had a low sex ratio.

Column B indicates that the rural non-farm group closely resembled the urban characteristics. The dispersion was slightly greater and the median was rather higher at 95, but the diagram offers further evidence that the rural non-farm group had greater affinity with urban demographic characteristics than those of the rural farm. Column C demonstrates that the rural farm group dispersion had a complete discontinuity with the urban and non-farm groups. Rural farm sex ratios were uniformly high with a median of 113 and an inter-quartile range of from 109 - 116, while in no county did the ratio fall below 100.

It may be summarised that in almost all the urbanised areas and in the rural non-farm sample there was an overall preponderance of female population while in all the selected rural farm groups there was an even more marked preponderance of males. The chief factor in this unbalanced nature of the sex ratio will be shown in the next chapter to be internal migration, which was predominantly from rural to urban areas in the decade 1940 - 1950 and which was sex selective in favour of females.

Detailed Variation in the Sex Ratio

Bearing in mind the major differentials outlined above it is now possible to examine the spatial variations in the sex ratio in the Corn Belt in greater detail in 1950. This is indicated by Map 36 on a county basis.[80] From Map 36 it is apparent that the highest sex ratios of over 109 occurred in two separate circumstances. Firstly high sex ratios occurred in large areas of the North Western Corn Belt in the Upper Missouri, Sioux and Minnesota River valleys in areas of extensive farming, low population density, predominance of rural farm in the total population, and areas which it will be shown in the succeeding chapter have experienced considerable loss of population due to migration. Secondly high sex ratios occurred to a lesser extent and with a scattered distribution in counties contiguous to some of the largest urban centres where the immediate attraction of urban employment has resulted in out migration of female labour.

The lowest ratios of less than 96 were associated with the counties containing the largest urban centres of the Corn Belt, and the surrounding counties with a high

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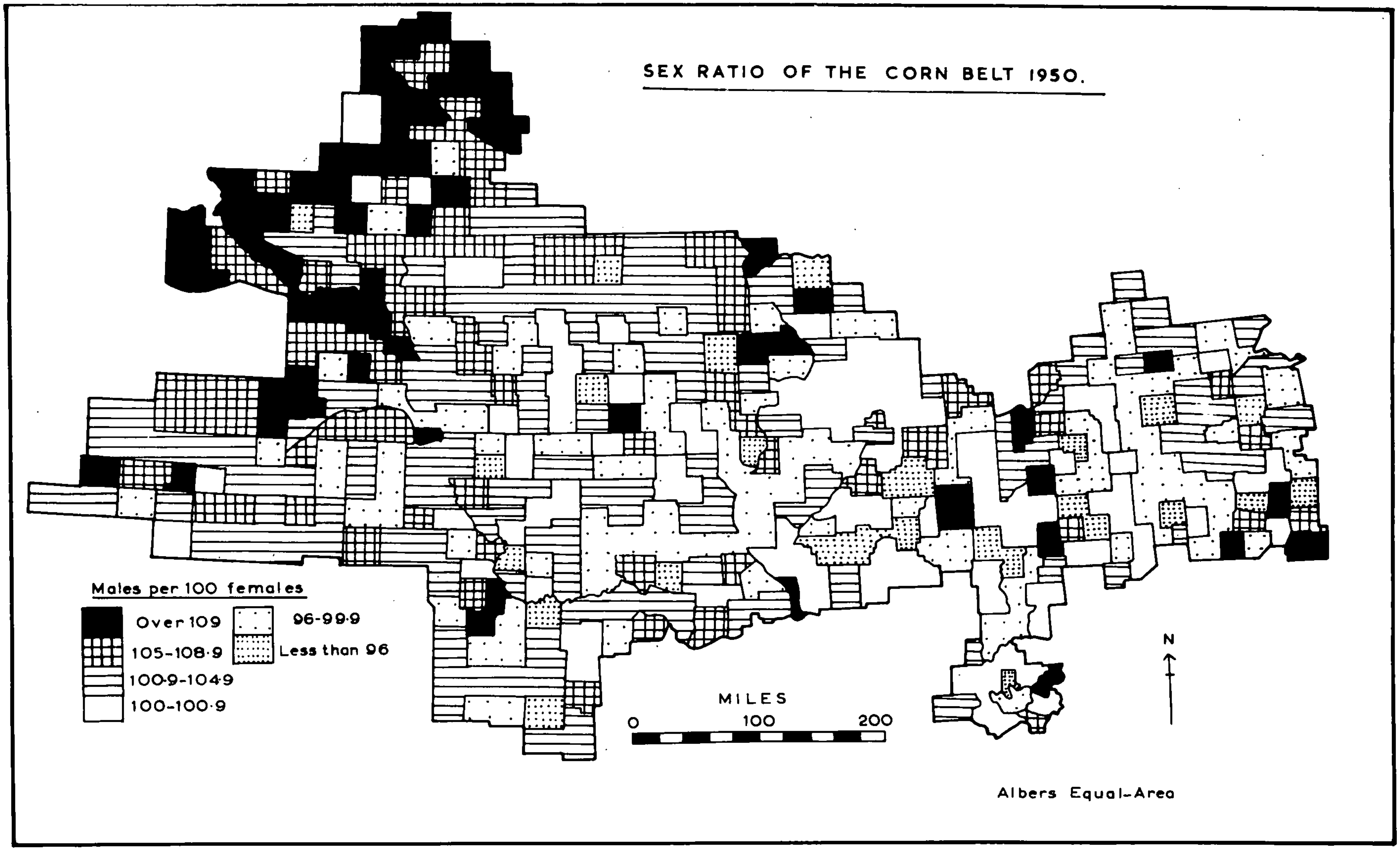
[80] Map 36 calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population. Table 41.

MAP 36.



SEX RATIO OF THE CORN BELT 1950.

Males per 100 females
Over 109
105-108·9
100·9-104·9
100-100·9
96-99·9
Less than 96
MILES
0
100
200
N
Albers Equal-Area

proportion of urban and rural non-farm population. The intermediate sex ratios showed a pattern of distribution. Ratios of from 96 - 100 predominated in the counties east of the Mississippi Valley where the rural farm element was less significant proportionately than both urban and rural non-farm and where urban influence permeated rural life more thoroughly. The reverse situation applied west of the Mississippi Valley where rural farm population was more significant proportionately and where out migration of rural population was almost universal during the decade.

The significance of the contrasts in sex ratios described above was enormous in the decade 1940 - 1950. The contrasts in the balance of the sexes had a great influence on the marital rate and therefore on birth rates. In particular when crude birth rates are considered the effect was to exaggerate the urban rate as a result of the influx into the urban centres of young migrants in the reproductive age groups and a depreciation of the crude birth rate in rural areas as a result of the out migration of the age groups with the highest fertility rate and a highly unbalanced sex composition in the residual population. In actual fact when age and sex specific birth rates are considered the rural population remained the more fertile but the high crude birth rates of the urban population exaggerated by the influx of young migrants with a low sex ratio largely explains the higher rate of natural increase in urban rather than rural residence despite the higher specific fertility rate of the rural population. The effect of these contrasts in the sex ratio on the differential growth of urban and rural population is further analysed in Chapter Nine.

2. MARITAL COMPOSITION

The characteristics of the sex ratio described above exerted a strong influence on the marital composition, since the sex ratio was the chief determinant of the potential number of marriages, which in turn influenced the trend of the birth rate.

As with the sex composition, so also in the case of the marital composition certain definitions are standardised and have been used consistently. The appropriate definition in the United States Census enumeration is that of "marital status", which consisted of married, widowed, single and divorced. A further convention is the use of the ratio of the "marital rate" which is the number of marriages as a percentage of the total population over 14 years. The first data on marital status was recorded in the census of 1890 and considerable detail is available and many studies have been published.[81 and 82] It is the purpose of

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[81] Vide Taeuber and Taeuber, "The Changing Population of the United States", Chapter 8, Census Monograph Series, Wiley, New York, 1958.

[82] Vide also Duncan and Reiss, "Social Characteristics of Urban and Rural Communities, 1950" Chapter 5, Census Monograph Series, Wiley, New York, 1956.

this section to summarise the major differentials in marital status and to describe the causative factors and demographic implications.

The Changes in Marital Status, 1890 - 1950

Diagram 15[83] indicates the trend in the marital status of the populations of over 14 years of the selected Corn Belt states of Indiana, Iowa, Illinois and Nebraska from 1890 - 1950. The most obvious trend in the sixty year period has been the increase in the marital rate of from approximately 50% to 70%. There was a marked slowing of this trend in the decades from 1920 to 1940 which may be attributed to the effects of the depression which resulted in much delaying of marriage for economic reasons. A further deviation in the general trend was the upsurge in the marital rate between 1940 and 1950 which in part was again due to the delaying effect of the war and also reflected a trend in the decade towards marriage at a younger age. The discrepancy between the male and female rates is attributed to the effect of widowhood.

Characteristics of Marital Status, in 1950

Table 54 below summarises the marital status of population over 14 in the same four selected states in 1950 for the total population and the nonwhite component.

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[83] Diagram 15 calculated from U.S. Bureau of the Census, Census of Population, 1950. Volume II. "Characteristics of the Population", Table 15.

DIAG. 15.

CHANGES IN MARITAL STATUS 1880-1950. – FOR FOUR SELECTED CORN BELT STATES.

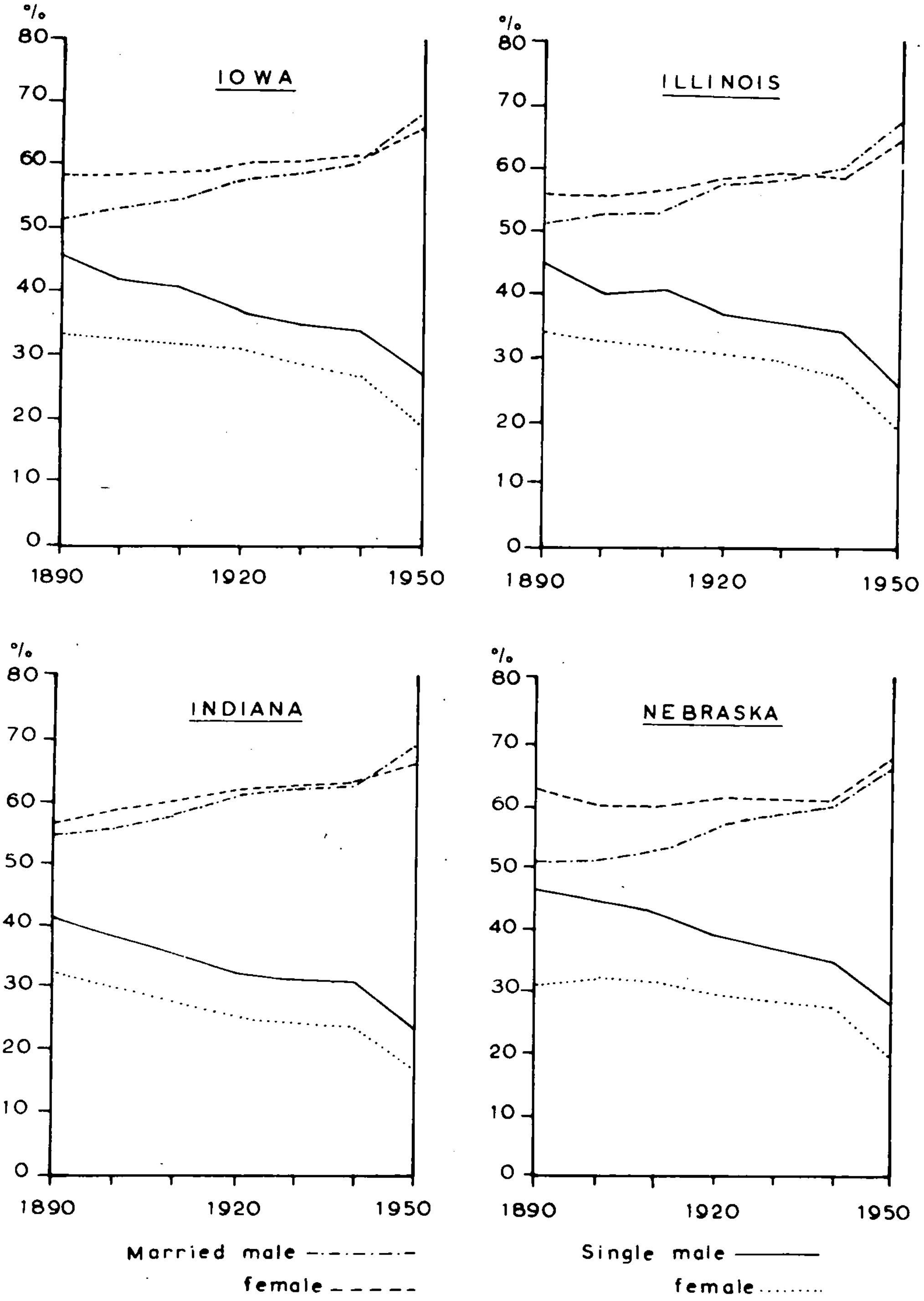

TABLE 54

MARITAL STATUS OF POPULATION OVER 14 YEARS IN 1950, TOTAL POPULATION AND NONWHITE IN FOUR SELECTED CORN BELT STATES

	Males				Females			
	1. TOTAL POPULATION (1)							
State	% Single	% Married	% Widowed	% Divorced	% Single	% Married	% Widowed	% Divorced
Indiana	23.4	69.8	4.4	2.4	17.7	68.0	11.4	2.9
Illinois	25.7	67.6	4.5	2.2	19.6	65.6	12.0	2.7
Iowa	25.7	68.0	4.4	1.9	19.4	67.1	11.4	2.1
Nebraska	27.3	66.7	4.4	1.7	19.8	67.1	11.1	1.9
	2. NONWHITE POPULATION							
Indiana	23.7	66.4	5.9	4.0	17.0	62.9	14.8	5.4
Illinois	24.7	66.7	5.5	3.1	16.3	64.2	14.7	4.8
Iowa (2)								
Nebraska (2)								

Source: U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population, Table 56 and 57.

(1) Where percentages do not total 100% balance is enumerated as "marital status not reported"
(2) Statistics of nonwhite marital status not available for Iowa and Nebraska.

From Table 54 it is seen that in 1950 there was a marked male preponderance in the selected states in the single marital status. This may in part be attributed to the effect of the differential birth rate but more probably to the effect of the tendency for women to marry at an earlier age than men, and also reflects the unbalance of the sex ratio in rural areas as a result of migration. In the case of the married proportion there was a tendency to a slight preponderance of married males over females. This was accounted for by the higher proportion of females in the widowed category as a result of sex differential mortality rates. In the case of the divorced proportion there was a tendency for lower values in the more rural Iowa and Nebraska.

Nonwhite figures were available for Indiana and Illinois and show that the characteristics were similar to those of the total population with the exception of the widowed and divorced proportions which were appreciably higher. In addition to these differentials on the basis of sex and race, further contrasts were found in relation to both age group and type of residence.

Marital Status according to Age Group

There are important contrasts in marital status in a given population both according to sex and especially in relation to the various age groups. Table 55, in the Appendix, summarises these differentials in Iowa and Indiana, while Diagram 16 illustrates the situation in 1950 in Illinois and Nebraska.[84]

1. Single population

The trend of the single population by age groups was the most consistent and straightforward. The graph shows a rapid decline in the selected states in the single proportion to 15% at the age 25 - 29 years in females and 30 - 34 years in males, after which there was scarcely any variation in the single proportion. The discrepancy between the two sexes is attributed to the tendency for males to marry females of a younger age, or conversely, for women to marry at a younger age than men.

2. Married population

The trend in the married category until the age group 25 - 29 years was the exact opposite of the single graph, with a comparable discrepancy between the sexes for the same reason as above. In fact the age at which the married proportion reached its highest point in all four states tended to be ten years later in the case of males than the maximum in females. The decline in the married proportion in females however began at a much earlier age

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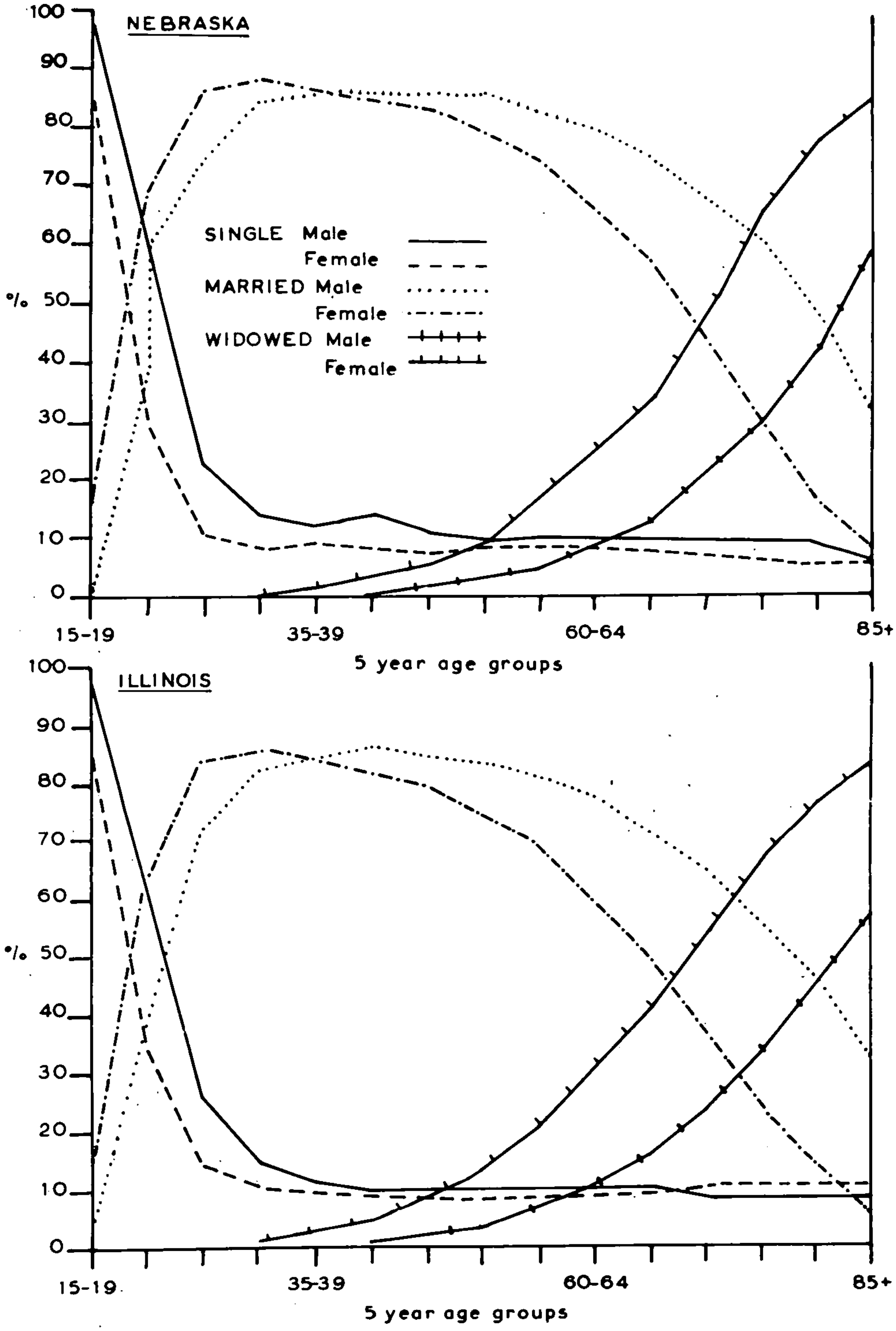
[84] Diagram 16 calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume II. Characteristics of the Population, Table 57.

DIAG. 16.

MARITAL STATUS BY AGE GROUPS 1950



and again the discrepancy was approximately 10 years; 30 - 34 years in the case of females and 40 - 44 years in the case of males. This discrepancy was a function of the higher proportion of widowed at an earlier age in the case of female population as a result of sex selectivity in the mortality rate.

Differentials in Marital Status according to Type of Residence

Table 56, in the Appendix, tabulates the characteristics of marital status by type of residence in the four selected states; the major residential contrasts may be summarised briefly.

In the case of male population there was a consistently higher unmarried proportion among rural farm than either rural non-farm or urban. Conversely in the case of female population there was a much higher proportion of unmarried females in urban residence than in the instance of rural farm residence. The same circumstances were reflected in the married proportion. A lower proportion of females were married in urban residence than in rural while the converse applied to male population. This illustrates the inter-relation between the characteristics of the sex ratio and the marital status and the effectiveness of internal migration as a demographic agent.

The incidence of widowhood was much higher proportionately in urban residence than rural and the concentration of a high proportion of widows in rural non-farm residence was remarkable. The reasons for the high proportion of widows was the higher mortality rate and lower life expectancy of urban male as opposed to rural male and to a lesser extent the retirement of rural females on widowhood to urban residence. Finally, it is apparent that the characteristics of marital status of rural non-farm were closer to those of urban than rural farm residence.

3. CHARACTERISTICS OF THE AGE COMPOSITION OF THE CORN BELT

The age composition of a given population cannot be regarded as a static situation. The 1950 characteristics of age composition reflected the vital events of the previous seventy years and at the same time contained implications for the future age structure. Since the present structure is a product of the vital events of previous decades it is necessary as a starting point to indicate the trends in age composition.

The Trend in Age Composition 1880 - 1950

The population of the Corn Belt may be subdivided into three major age groups on a functional basis for general descriptive purposes:-

1. 0 - 14 years, children under age of employment.
2. 15 - 64 years, adults, forming the bulk of the labour force.
3. Over 65, predominantly retired persons.

Diagram 17 indicates the trend in the proportion of these three age groups in the total populations of four selected states from 1890 - 1950.[85] From Diagram 17 the following trends emerge:-

1. There has been a consistent increase in the over 65 years age group from 3% or less in 1890 to 8 - 10% in 1950. This increase is attributed to the decrease in the mortality rate and resultant increase of life expectancy during the sixty year period.

2. The reverse trend applied in the case of children under 14 years. This category decreased from approximately 40% in 1880 to 25% of the total population in 1940. This was a result of two trends; the reduction in the mortality rate after 1880 which increased the proportion in the older age groups and secondly reflected a decrease in family size and reduction in the birth rate. The significance of the birth rate is shown by the trend from 1940 to 1950 when the downward trend in the age group 0 - 14 years was reversed at a time when the birth rate increased rapidly in the post war years.

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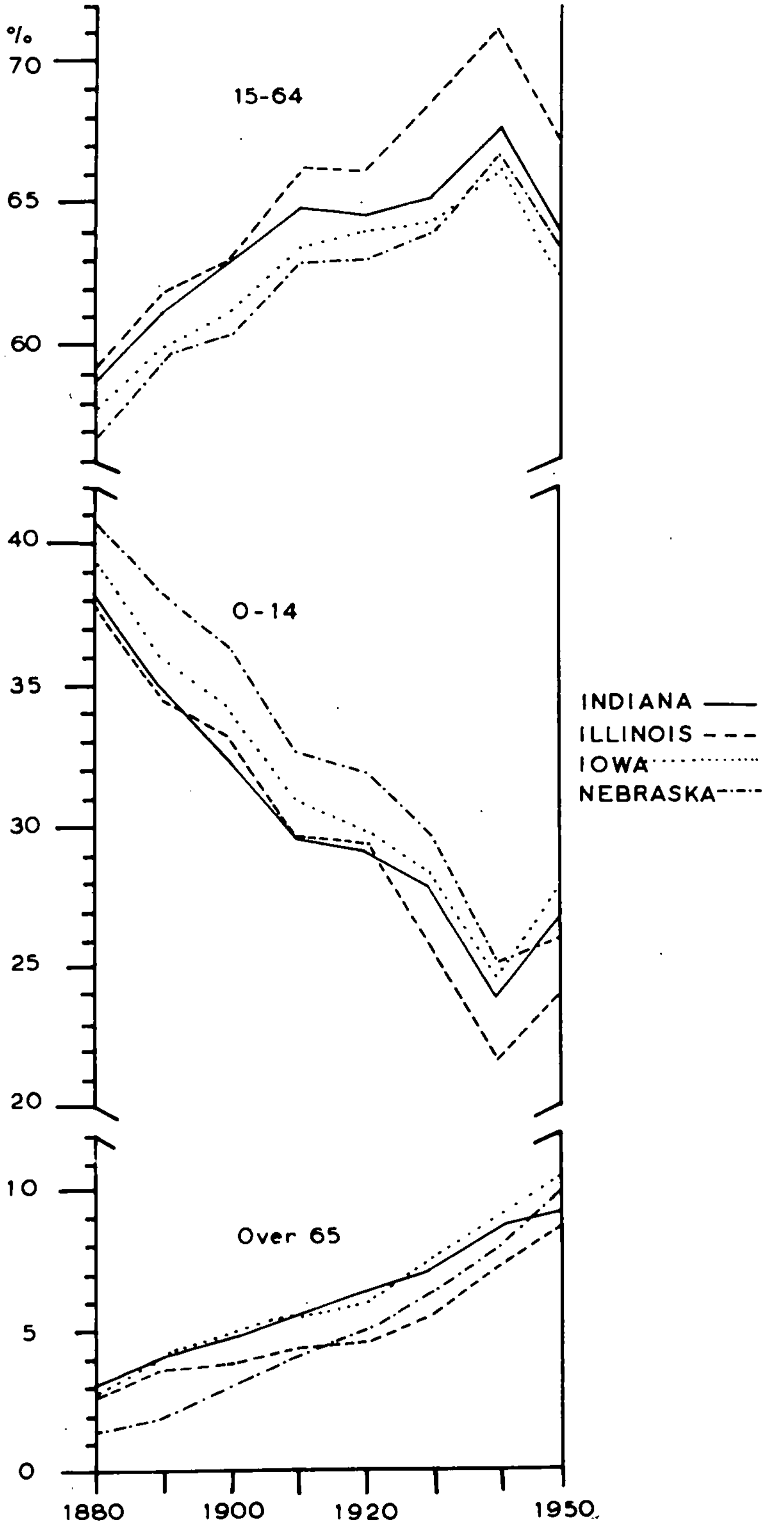
85. Diagram 17 calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population. Table 16.

DIAG.17.

CHANGES IN AGE COMPOSITION 1880-1950

SELECTED CORN BELT STATES



3. The proportion in the adult group of from 15 to 64 years has largely been determined by the trends in the other two groups and has fluctuated accordingly. It was significant that the increase in the proportion of children in the decade 1940 - 1950 was at the expense of this group rather than the over 65 proportion, which also increased during this decade.

The trends in the age structure of the white and nonwhite groups show marked contrasts in detail. Diagram 18 illustrates that although the overall trend in age composition was similar in the period 1880 - 1950 there were marked discrepancies in the actual values of the proportion in the three age groups.[86] The nonwhite proportion in the age group over 65 years was consistently below that of the white proportion in the same group. In fact, until 1940 there was hardly any increase at all in the nonwhite proportion of over 65 years in the sample states. This reflected the higher mortality rate in negro population and the much lower life expectancy. In the case of the age group of under 15 years the nonwhite proportion was again appreciably lower than the white. This is part reflected the higher incidence of infant mortality in negro population but may also be exaggerated

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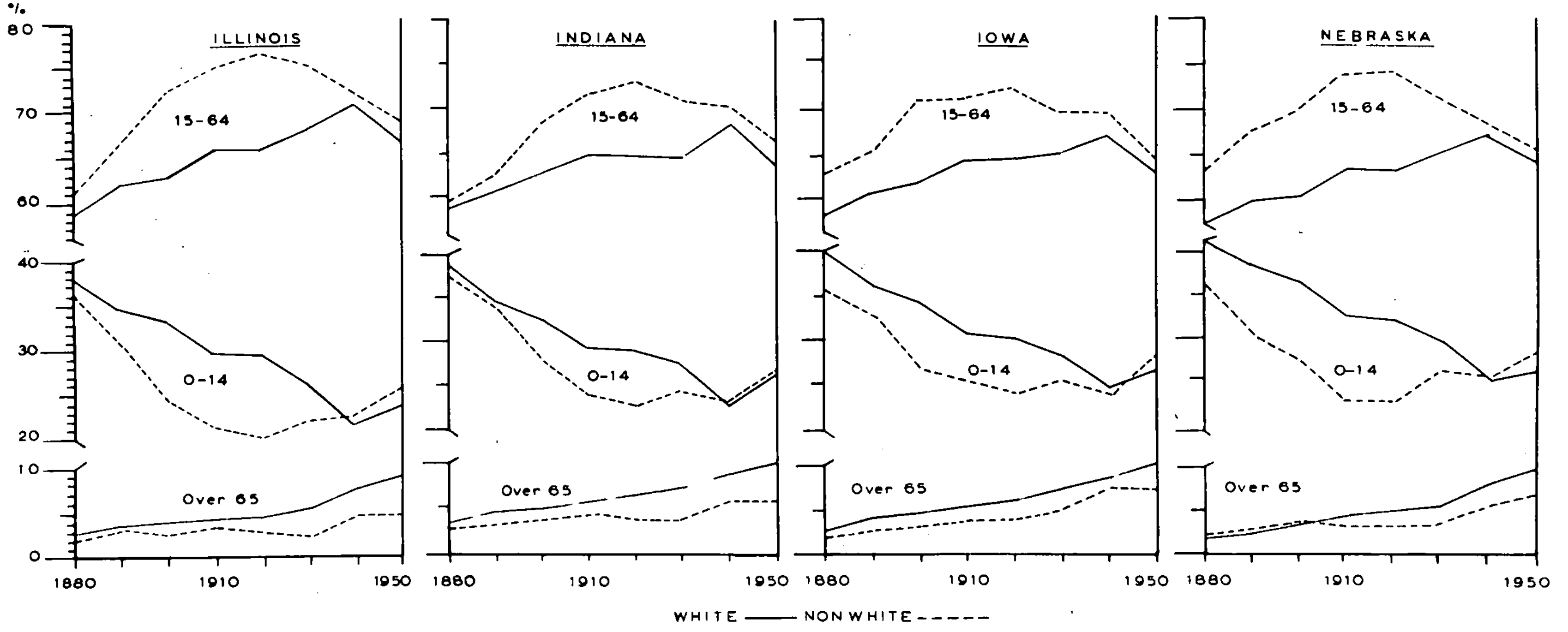
[86] Diagram 18 calculated from U.S. Bureau of the Census, Census of Population, 1950. Volume II. *Characteristics of the Population*, Table 16.

DIAG. 18.



CHANGES IN AGE COMPOSITION 1880-1950.

FOUR SELECTED CORN BELT STATES

by the under recording of negro births. There was however a reverse in this situation in the decade 1940 - 1950 when the nonwhite proportion of children exceeded that of the white. This may be attributed to the very high fertility rate of the negro in the post war years, a reduction in infant mortality and perhaps also in part to a more accurate enumeration of negro birth.

In summary, the discrepancies between the white and nonwhite groups as far as age structure is concerned appear to have narrowed considerably during the period 1880 - 1950 except in the case of the proportion over 65 years. This reflected an amelioration in the social condition of the negro from the situation a mere fifteen years after the abolition of slavery up until the present.

A further means of summarising the trend in age composition on a sample basis is by reference to a triangular diagram[87]. Diagram 19 shows the general trend in age composition in the period 1880 - 1900 for the state of Indiana. The trend line indicates clearly the advance in the proportion over 65 years, the decline in the proportion under 15 years until the decade 1940 - 1950 and shows especially that the post war expansion of the proportion of children was at the expense of the proportion

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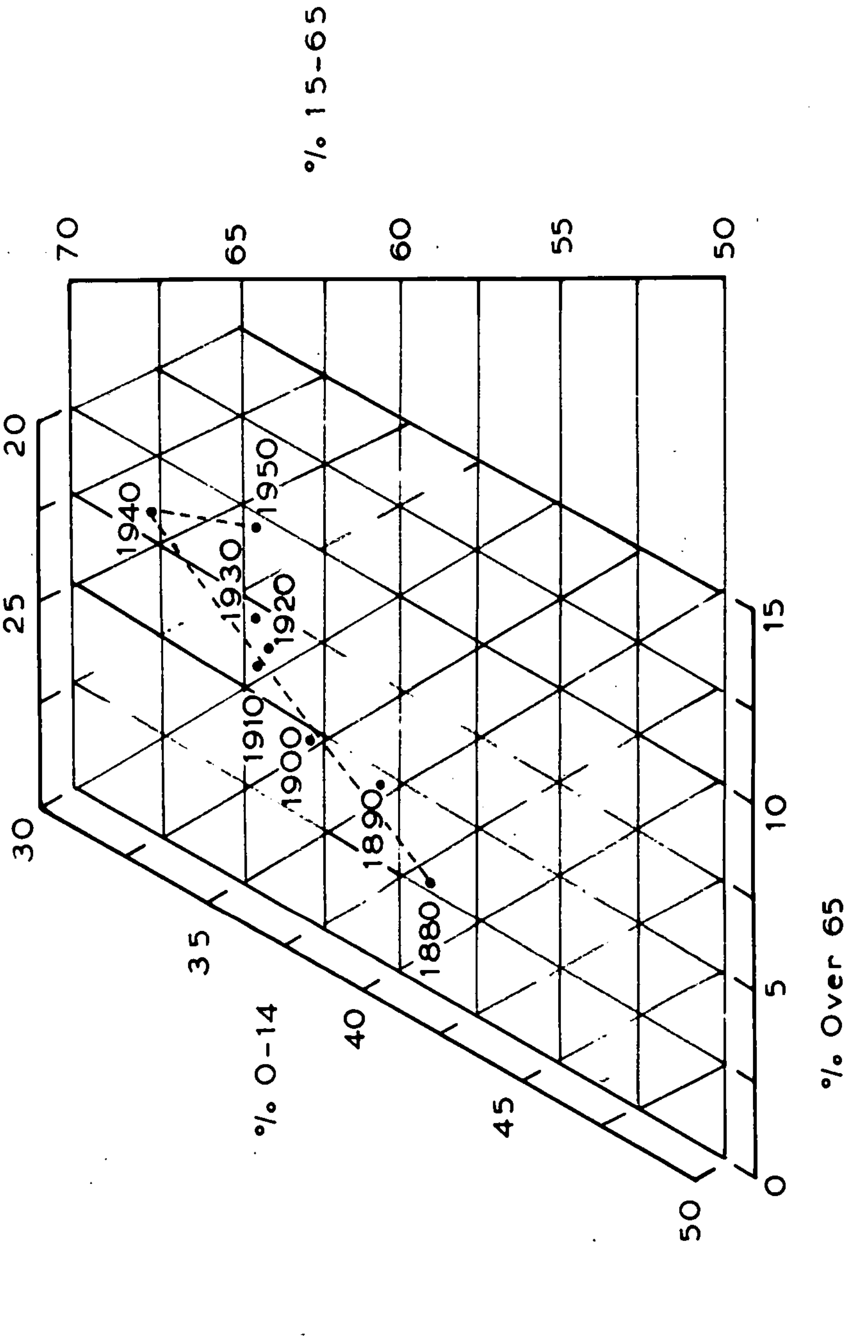
[87] For an example of the use of the triangular diagram in the analysis of population data vide George P., "Introduction à l'étude géographique de la Population du Monde", p.100, Presses Universitaires de France, Paris. 1951.

DIAG. 19.

THE AGE STRUCTURE OF INDIANA 1880–1950



of from 15 - 64 years rather than the over 65 years group.

Residential Differentials in the Age Structure

The major differentials in age structure in 1950 other than the racial one already mentioned, were those based on differences of type of residence. These differentials are summarised in Diagrams 20 and 21.[88] Diagram 20 is a dispersion graph illustrating the proportion of the population in the three major age groups in samples of the three major types of residence. The rural farm and rural non-farm dispersion is based on a 10% sample of the counties of the Corn Belt and the age composition of the urbanised areas of the Corn Belt has also been plotted. Diagram 21 indicates as a separate graph the median values of the three residential groups in Diagram 20. From an analysis of these two diagrams the major residential differentials may be summarised.

1. Urbanised Areas

The proportion in the age group 0 - 14 years tended to be lowest in the urban centres of all three types of residence. This low proportion of children in part may reflect the lower specific birth rate in urban as opposed to rural residence but was chiefly a function

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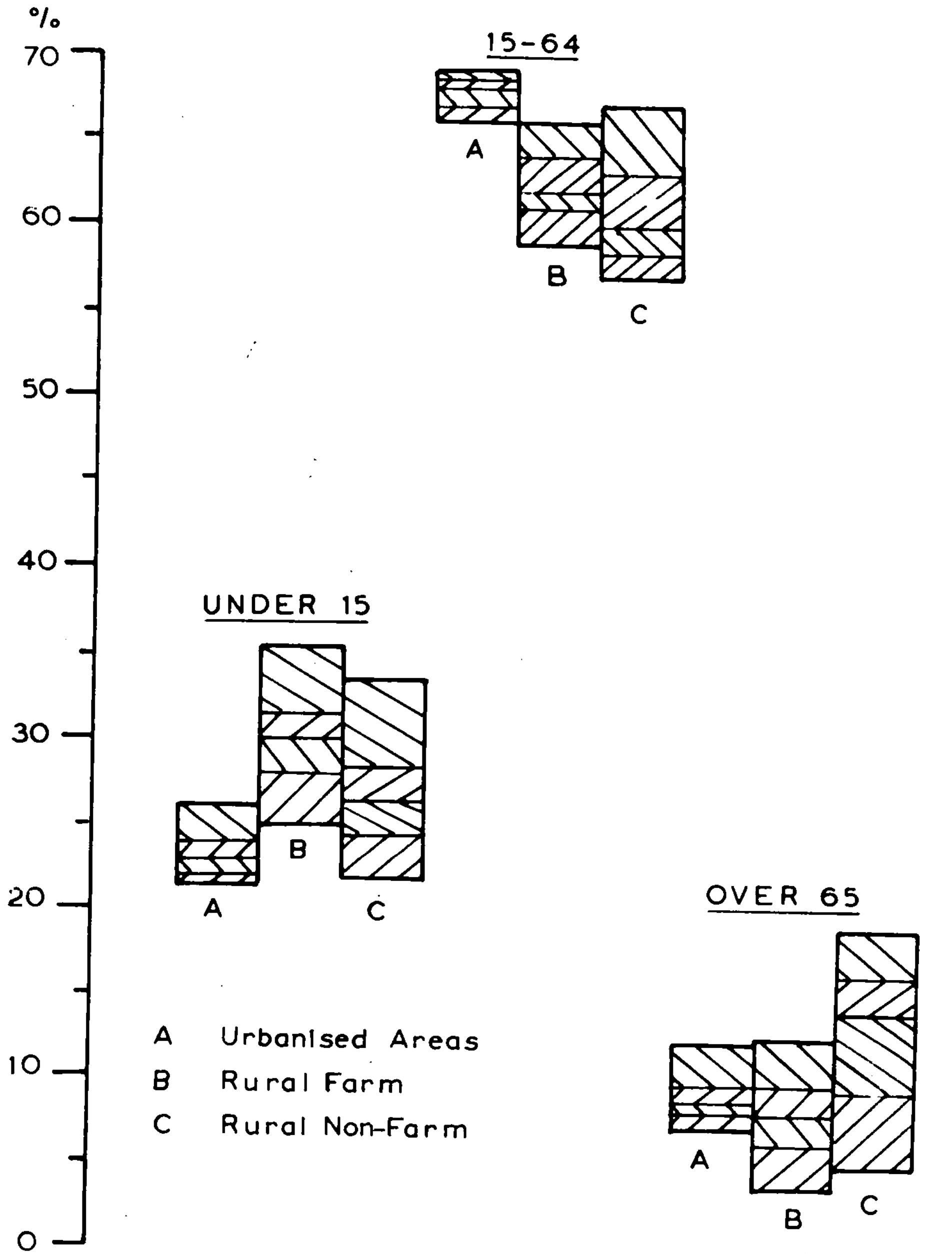
[88] Diagrams 20 and 21 calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population, Tables 33 and 41.

DISPERSION DIAGRAM OF AGE STRUCTURES OF SELECTED URBAN AND RURAL SAMPLES 1950

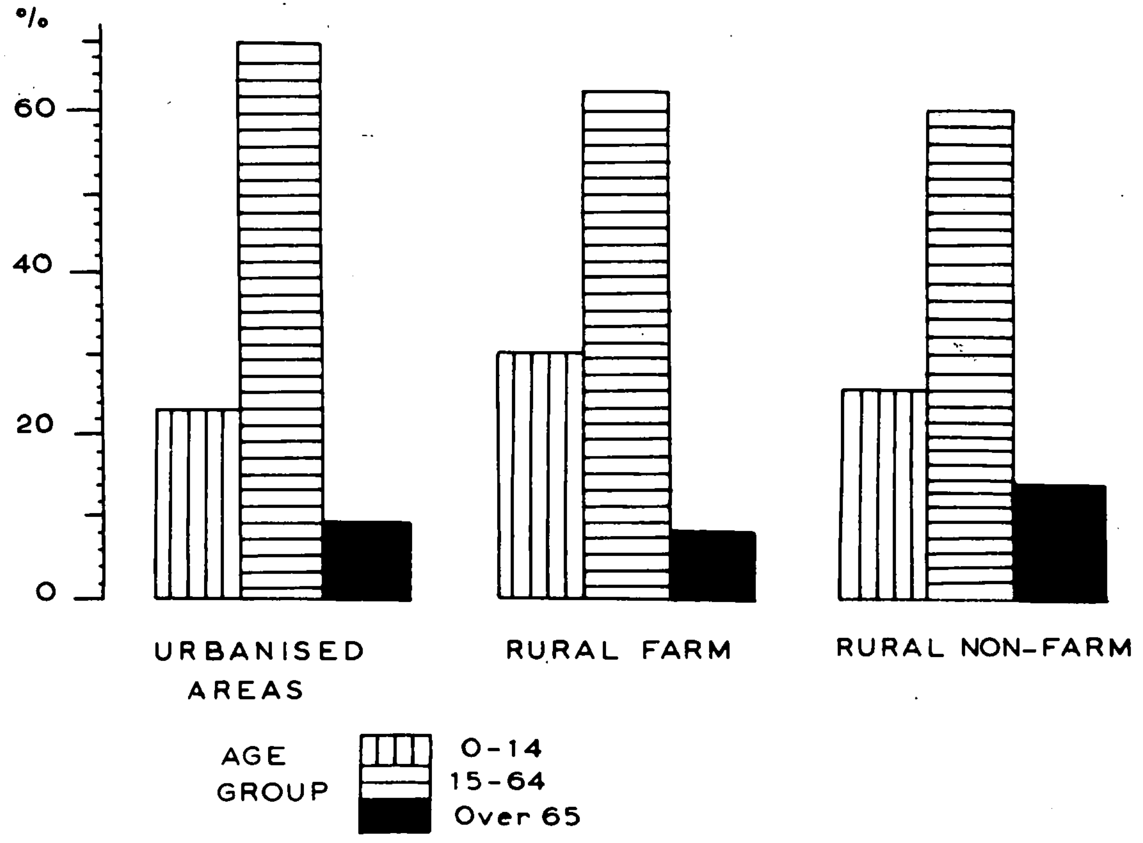


DIAG. 21.

VARIATION IN AGE COMPOSITION & TYPE OF RESIDENCE

MEDIAN VALUES OF SELECTED SAMPLES

1950



of the large scale migration of rural population in the age group 15 - 64 years to the large urban centres thus reducing the proportion in the lower age groups. The large urban centres also had a low proportion in the age group over 65 years which is in part due to the higher urban mortality rate, in part due to the habit of retirement to the rural-urban fringe outside the urban census definition, but also reflected the distortion of the age structure as a result of immigration in the lower age groups.

2. Rural Farm

The rural farm group had the highest proportion of children under 14 in the total population. This was due to the higher rural farm specific birth rate, but more especially was due to the decrease in the proportion in the middle group of from 15 - 64 years by migration to urban residence. The rural farm also had the lowest proportion in the retired age group of over 65 years. This may be attributed to the retirement of farm holders leaving the farms in the management of their children and taking up rural non-farm or urban residence, and more especially to the retirement of farm tenants where a change of residence is necessitated on retirement.

3. Rural Non-Farm

The rural non-farm group had the highest proportion of persons in the age group of over 65 years. It has been suggested that this is a result of much suburban and urban fringe settlement, with a high proportion of retired and elderly residents, to fall within the census definition of rural non-farm.

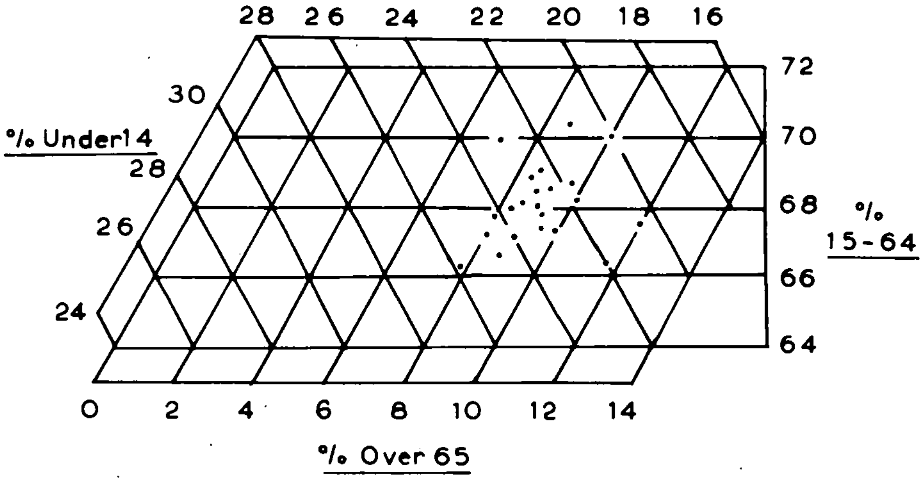
Finally in this general discussion of differential factors in age composition, the significance of residence may be summarised by reference to triangular diagrams. Diagrams 22 and 23 illustrate graphically the dispersion of the selected samples of the three residential types. These diagrams strengthen the conclusions outlined above. From Diagram 22 it is apparent that in 1950 the age structure of the urbanised areas was most consistent with notably a small proportion in the age groups 0 - 15 years and over 65 years and a concentration in the group 15 - 65 forming the bulk of the labour force. By contrast the same diagram indicates the prominence of the under 15 years group in the rural farm sample and Diagram 23 indicates the higher proportion of over 65 years in the rural non-farm sample. Table 57, in the Appendix, supplies the detail in the case of the age structure of the urbanised areas.

It has been established by reference to general samples that the major factors influencing the spatial variations in age structure was the type of residence in

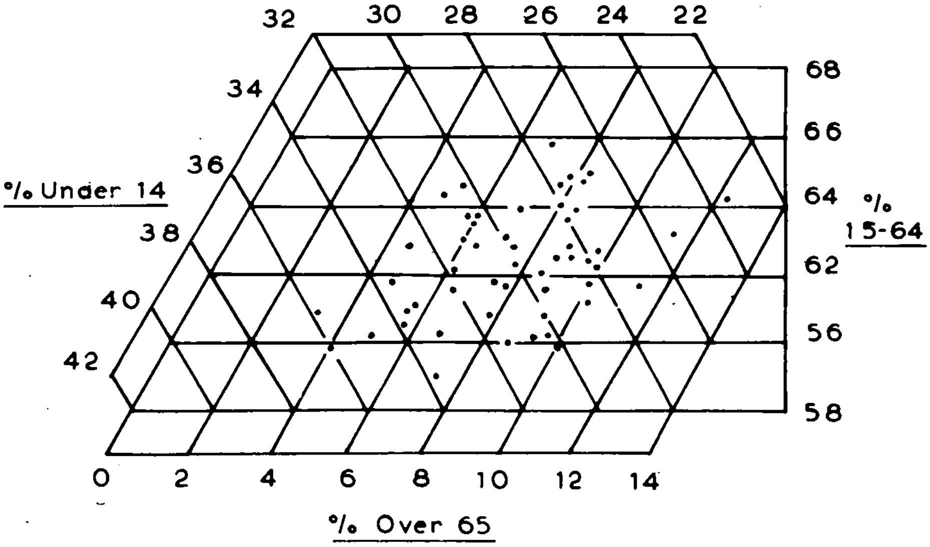
DIAG. 22.

AGE COMPOSITION 1950 – SELECTED URBAN AND RURAL SAMPLES

URBANISED AREAS



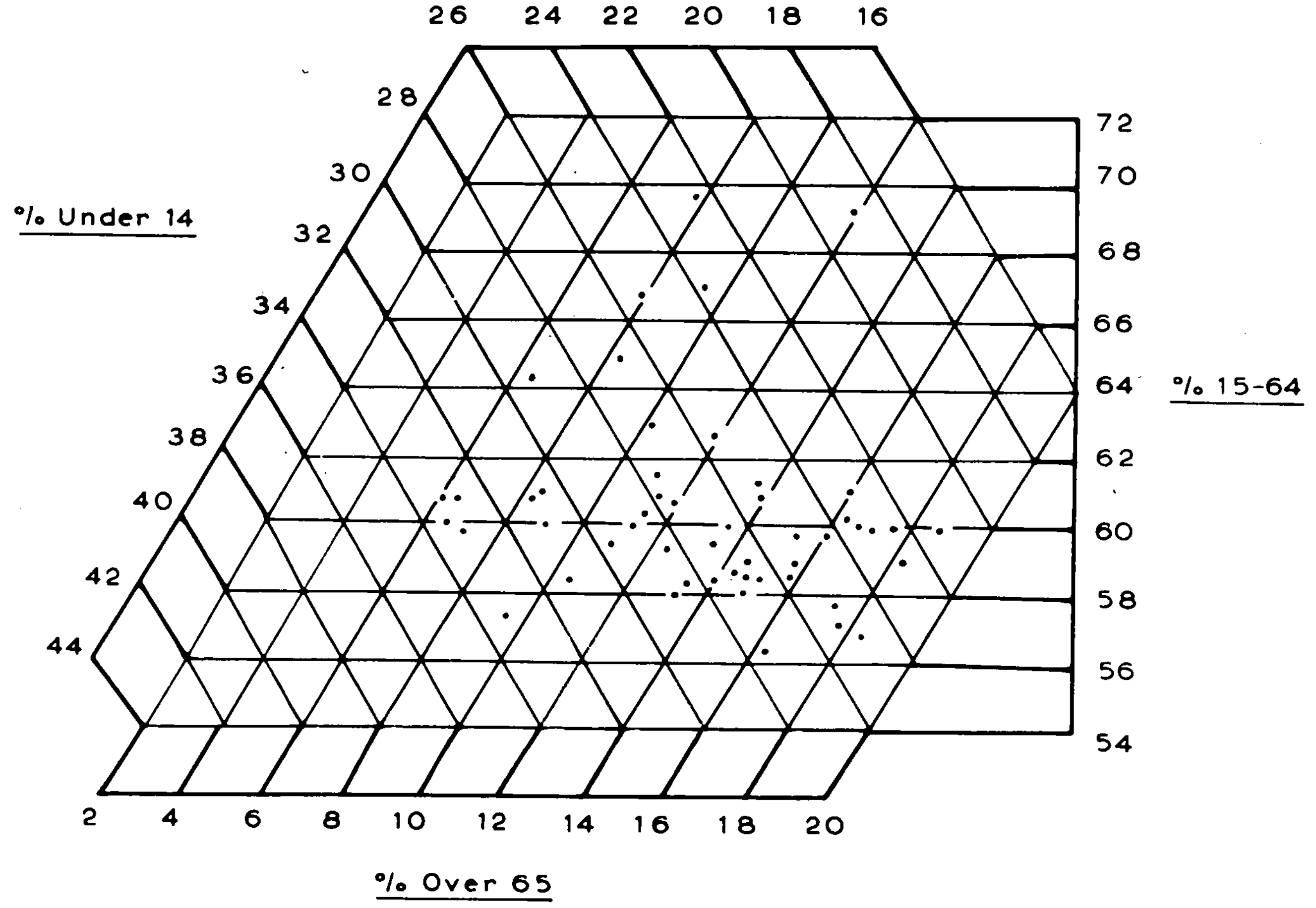
RURAL FARM (10% sample)



DIAG. 23.

AGE COMPOSITION OF THE RURAL NON-FARM POPULATION 1950

10% sample



relation to the pattern of internal migration, while in the recent decade fluctuations in the birth rate was influential. It is necessary to analyse these factors more specifically.

The contrasted states of Indiana and Iowa have been selected for a more detailed examination of the variations in age structure associated with particular forms of residence. Diagram 24 illustrates the detailed age structure of the two states by the conventional age pyramids by five year age groups in 1950. In general, in both states the pyramids exhibit the same characteristics as the national age pyramid. These were a broad base in the age groups 0 - 10 years as a result of the increased birth rate after 1940, and as shown in the 0 - 5 years group, especially in the post war years. Secondly, marked "erosion" of the age group 15 - 25 years corresponding with the low birth rates which prevailed in the depression years, and finally a "top heaviness" in the later age groups as a result of the increase in life expectancy and emphasised by the lower birth rate which affected the proportion in the age groups 15 - 25 years.[89] However breakdown by residence reveals many contrasts which may be summarised:-

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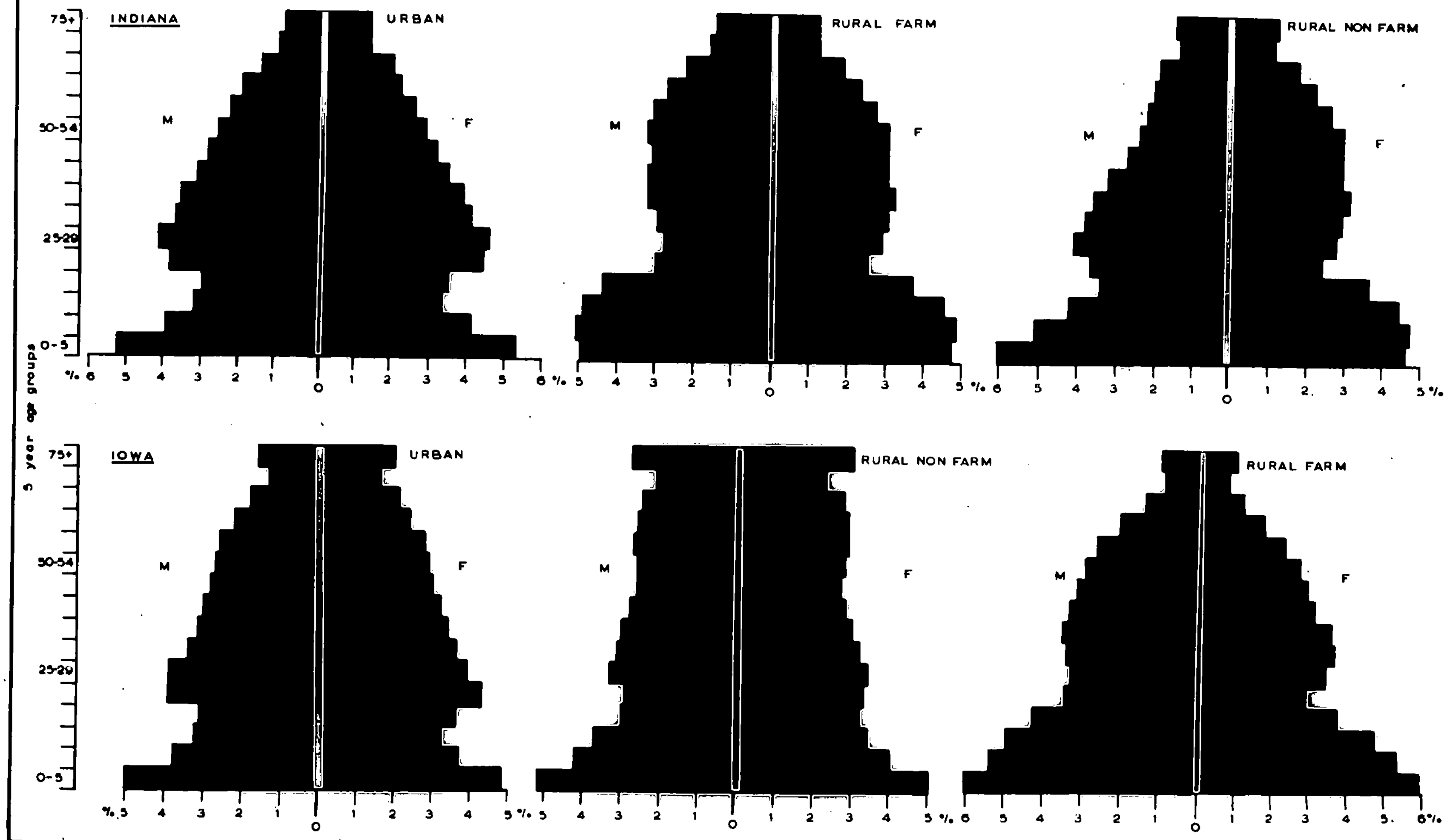
[89] Diagram 24 calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population, Table 41.

DIAG. 24.



AGE COMPOSITION OF INDIANA AND IOWA 1950

1. Urban age structure

In the urban pyramid the effect of the increased birth rate is especially marked at the base of the pyramid representing births from 1945 - 1950. Births between 1940 and 1950 accounted for approximately 9% of the total urban population in both states. This compares with approximately 6% of the total urban population in 1950 that was born in the depression decade of 1930 - 1940.

2. Rural Farm age structure

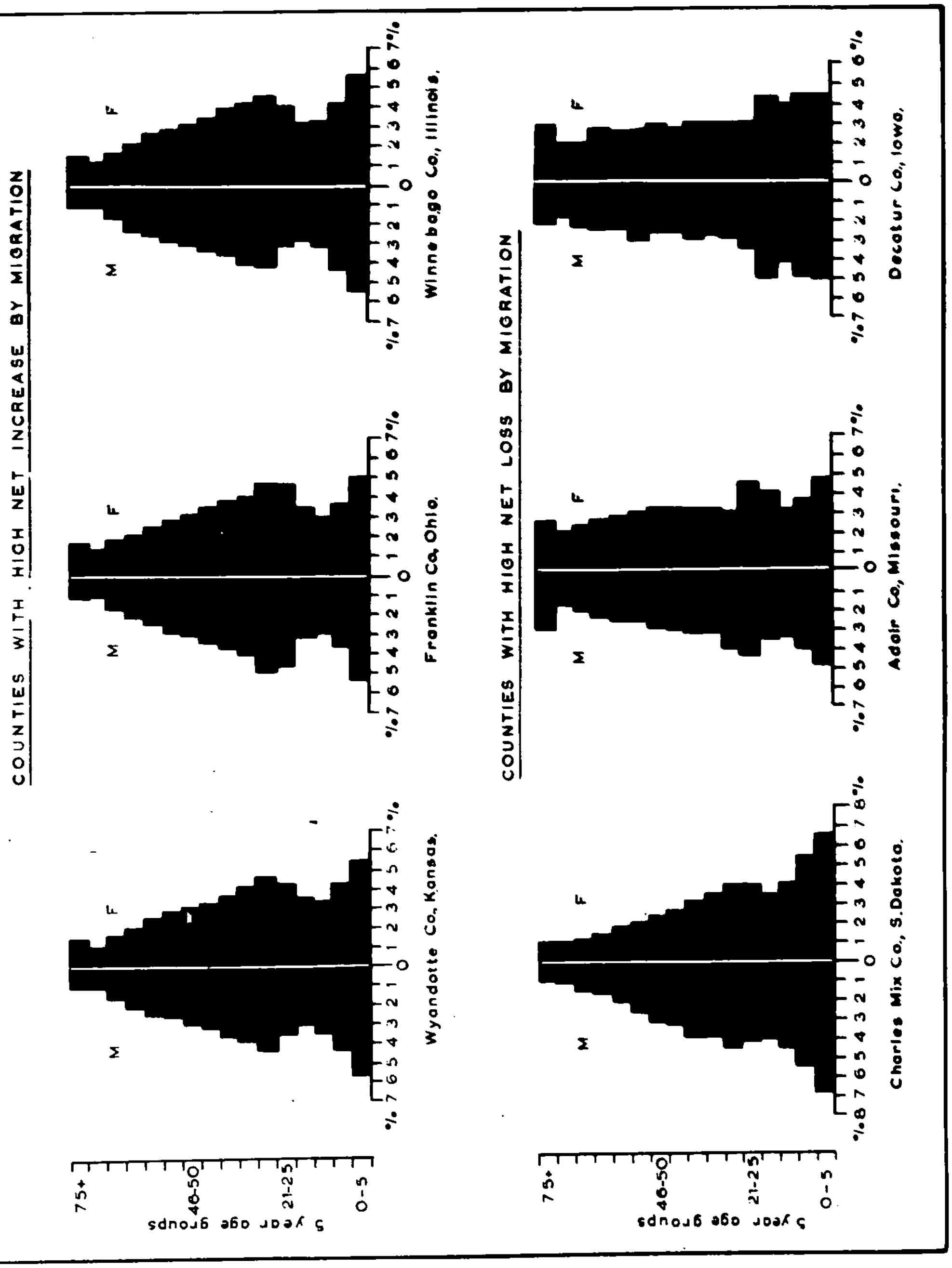
The rural farm pyramids indicate an even greater concentration in the age groups 0 - 15 years. The explanation of this is not only the increase in the birth rate but was a function of the migration in the middle age groups as indicated by the obvious erosion in the pyramid in the age groups above 15 years.

3. Rural Non-Farm age structure

This group tended to have intermediate characteristics between the urban and rural farm groups. The replacement rate at the base of the pyramid was equally high but the erosion in the middle age groups was much less severe than in the rural farm case. It may be suggested that two considerations in particular have influenced age structure. Firstly the increased birth rate after 1940 has resulted in an increase in the proportion under 10 years as compared with earlier decades and secondly the effect of migration from rural areas to urban residence has had the effect of diminishing the significance of the middle age group in rural areas and exaggerating its significance in urban centres. This migration particularly involved the younger middle age groups but as it had proceeded for several decades the effects are observable in all the middle age groups in the 1950 pyramid.

This may be further illustrated with reference to selected examples. Diagram 25 indicates the age pyramids of six selected counties, three of which have experienced a high net gain by migration and three which have experienced a high net loss of population by migration in recent decades. The contrasts in age structure are evident. The counties with gain by migration exhibit a top heaviness as a result of the exaggeration of the age groups above 21 years while the counties with a net loss by migration have a preponderance of young children and retired age groups while the proportion in the age groups of the labour force and highest reproduction were reduced. The significance of this contrast in age structure is far reaching socially and demographically. Socially the implications involve difficulty in planning the demand for social services and institutions, while demographically the chief influence is exerted on population increase. In the case of rural

THE EFFECT OF MIGRATION ON AGE STRUCTURE — SELECTED CORN BELT COUNTIES 1950



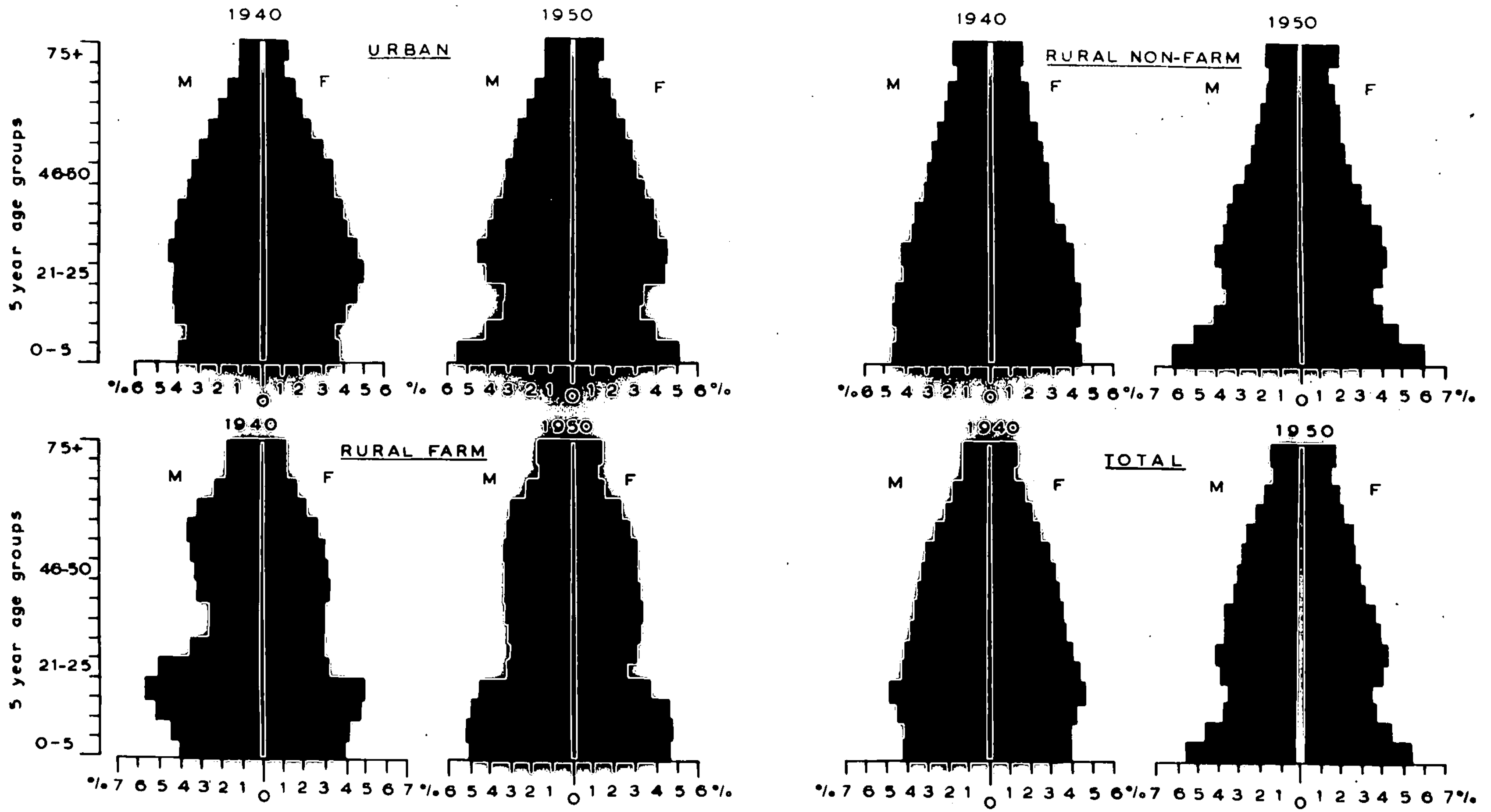
population where heavy loss by migration has taken place the diminution in the most fertile age groups results in a low rate of numerical increase despite the higher rural specific fertility rate. In the case of the urban population the increase in the most reproductive age groups results in a high rate of numerical increase. The paradoxical situation emerges that despite the higher specific birth rate in rural areas as opposed to urban, the crude birth rate and the actual rate of natural increase remains low. Conversely in urban centres the specific birth rate remains lower than the rural but because of the concentration of the population in the most reproductive ages the crude birth rate, and rate of natural increase are far higher.

A complex pattern existed therefore of an interaction of migration, age structure and natural increase in which the chief determinant was the migration from rural to urban centres.

Finally the effect on age structure of the post war increase in the birth rate may be further illustrated. Diagram 26 indicates the age structure of Indiana in both 1940 and 1950 sub-divided on a basis of residence. Considering firstly the total population pyramid it is seen that the increase in the birth rate in the decade effected an

DIAG.26.

THE AGE COMPOSITION OF INDIANA 1940 & 1950



increase in the proportion of children under 10 years from 8% in 1940 to 11% in 1950. The 1950 pyramid indicates that this increase was greater in the five year period 1945 - 1950 than in the previous five years. The residential pyramids indicate that this increase in the lower age groups was particularly a phenomenon of the urban and rural non-farm elements. In the case of the rural farm pyramid the increase was much smaller; from 8 to 9.5% in the case of the age group 0 - 5 years in 1950. This again is a reflection of the effect of migration in the middle age groups. Although rural specific birth rates surpassed urban, that is rural women in the child bearing period had a higher fertility rate than urban, the sheer concentration of population in the most reproductive years in urban residence ensured a higher crude birth rate and greater rate of natural increase in the case of the urban population. This supports Hart's recently published contention that in the decade 1940 - 1950:-

> "The much talked-about baby boom is primarily an urban phenomenon, compounded of a fantastic increase in urban birth rates and stagnating or declining rural rates". 90

The major differentials in the spatial variation

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90. Hart, J.F. "Age Pyramids of Indiana's Counties and Larger Cities", Indiana Academy of Science, 1957, Volume 67, Bloomington, Indiana, 1958.

of age structure have been described and the demographic mechanism involved has been shown to be the unbalancing effect of internal migration while the increase in the birth rate in the decade 1940 - 50 has further exaggerated the urban-rural contrasts. It remains to summarise the spatial variation cartographically and two measures have been adopted. Firstly the median age of each county has been plotted, and secondly the proportion of the total population over 65 and effectively withdrawn from the labour force was plotted for each county.

Map 37[91] indicates the spatial variation in the median age on a county basis. The median age for the total United States in 1950 was 30.2 years. Map 37 therefore shows the following age categories.

Very high	Over 37
High	34 - 36
Above national median	31 - 33
Approximate to national median	29 - 30
Very low	Under 28

From Map 37 areas of high and very high median age in the Corn Belt occurred in the predominantly rural areas of the Lower Missouri Valley and the southern margin of the Corn Belt in general. It will be shown in the subsequent chapter that this coincided spatially with the

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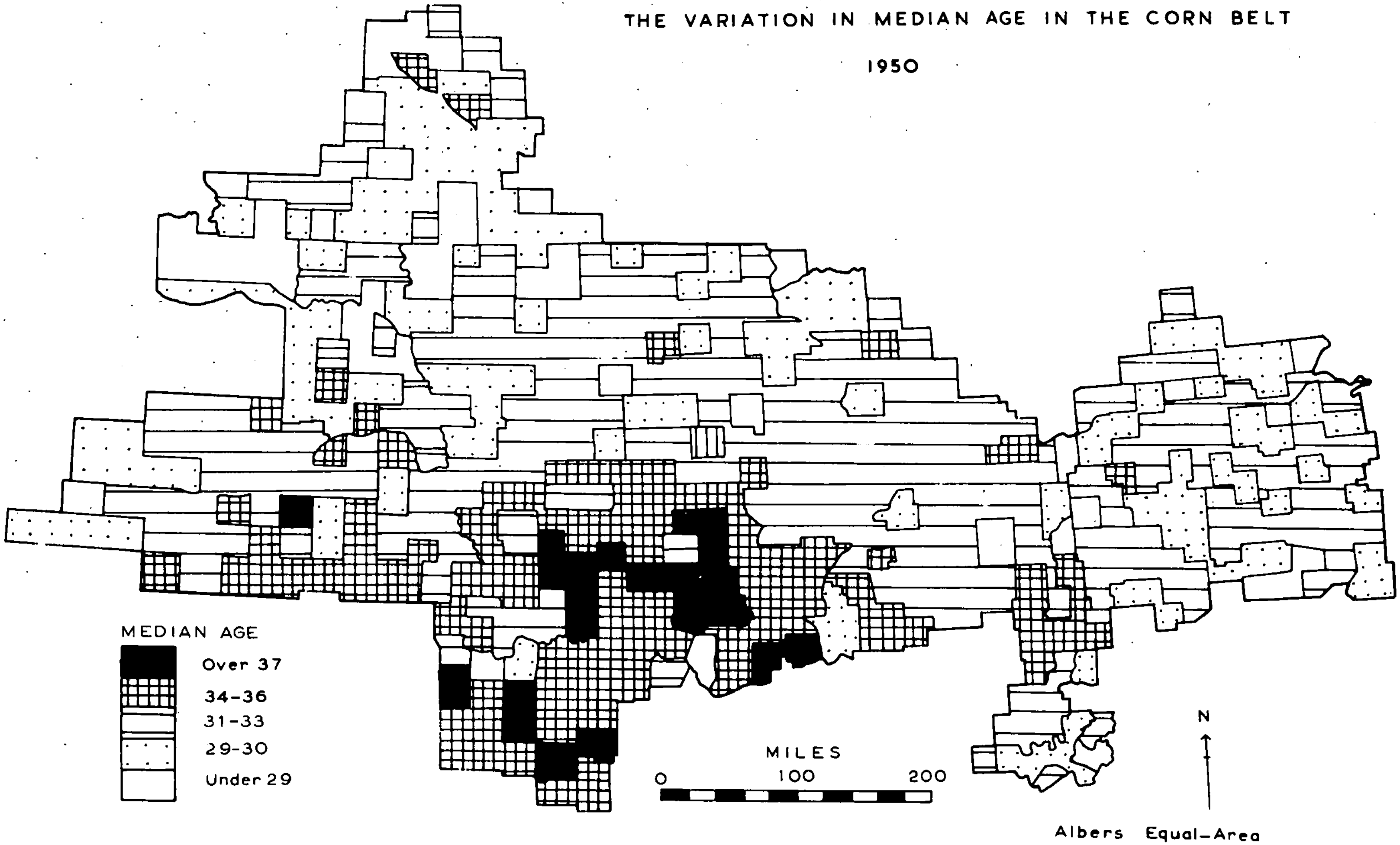
[91] Maps 37 and 38 calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population, Table 12.

MAP. 37.

THE VARIATION IN MEDIAN AGE IN THE CORN BELT

1950


MEDIAN AGE
Over 37
34-36
31-33
29-30
Under 29
MILES
0
100
200
N
Albers Equal-Area

area of highest loss of rural population by migration especially of rural farm population. It will be shown that in particular this involved the younger age groups leaving a residual age structure with a high proportion of older ages while it has been shown that the increase in the birth rate concerned the urban population rather than the rural farm and the consequence of these two circumstances has been an increase in the median age in the areas of rural depopulation. A second minor area of high median age occurred in the Eastern Interior Coalfield of Indiana and Illinois where again the causative factor has been migration.[92]

Areas of lowest median age coincided spatially with the distribution of towns where the concentration of migrants in the younger age groups and the post war increase in the birth rate were the causative factors. The majority of the counties containing urban centres had a median age slightly below the national figure while the vast majority of the Corn Belt had a median age slightly exceeding that of the nation as a whole.

Finally Map 38 illustrates essentially the same distributional pattern with a concentration of the oldest age groups in the areas of heaviest out migration and notably in the southern margin of the Corn Belt where the proportion

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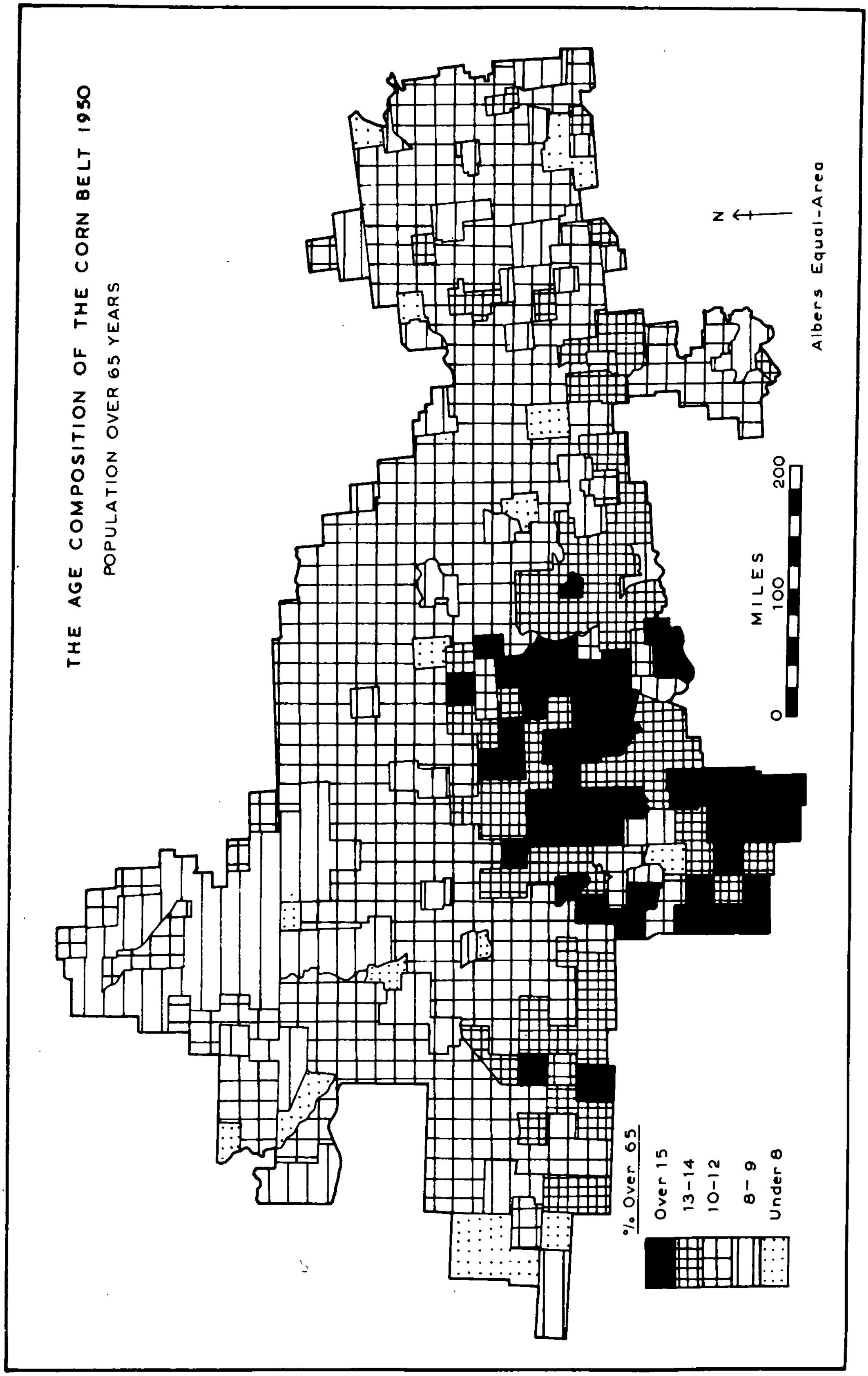
91. Vide Barton, T.F., Op. Cit. 69.

MAP 38.



THE AGE COMPOSITION OF THE CORN BELT 1950

POPULATION OVER 65 YEARS

% Over 65
■ Over 15
⊞ 13-14
▦ 10-12
▥ 8-9
⁘ Under 8
MILES
0
100
200
N
Albers Equal-Area

of ownership to tenancy was highest and tended to retain the older population on retirement to a greater extent than in the case of the areas of more prosperous farming and with a higher degree of tenancy.

Throughout the present chapter the significance of population movement as a factor underlying contrasts in age, sex and marital composition was stressed. Moreover, throughout this entire section on population structure, migration has been shown to have been the chief factor producing differential characteristics. Accordingly, the following chapter seeks to describe the characteristics of internal migration and assess its significance as a demographic factor in the Corn Belt.

CHAPTER EIGHT

THE INTERNAL MIGRATION OF POPULATION IN THE CORN BELT

SECTION THREE

PATTERNS OF MIGRATION, GROWTH AND DISTRIBUTION OF THE CORN BELT POPULATION

It is the aim of the final section of the thesis to describe in detail the present distribution and density of population in the Corn Belt, together with the mechanism by which it has evolved its characteristics.

The significance of migration as a demographic constant in the evolution of the Corn Belt population is developed in Chapter 8 with particular reference to the trends of the last decade. Similarly the whole topic of population growth commenced in Chapter 3 is continued in Chapter 9 from 1900 until the last census.

Finally, Chapter 10 correlates much of the previous findings of the thesis in an attempt to describe and account for the present complex detailed pattern of population distribution and density. In particular it is proposed that the present pattern of distribution is a composite one in which there is an essential duality between a basic agricultural pattern related functionally to the Corn Belt farming economy and a superimposed urban and suburban pattern with a less uniform distribution and only indirectly related functionally to the Corn Belt context of its location.

The contrasts between the two distinct patterns together with their inter-action is described as being fundamental to the understanding of the demography of the Corn Belt and provides a summary to the chapter.

CHAPTER EIGHT

THE INTERNAL MIGRATION OF POPULATION IN THE CORN BELT

Population movement may be considered to have two components, international migration involving movement from one country to another, and internal movement involving the redistribution of a nation's population within the national frontier. The relevant aspects of international migration to the Corn Belt have already been discussed.[92] The topic of internal migration has so far only been mentioned indirectly and it is the purpose of this chapter to assess the significance of internal migration in the demographic characteristics of the Corn Belt in 1950.

The definition of internal migration is complex. One attempt at definition is based on the sociological implications:-

> "Sociologically a migrant is a person who has changed the community of his residence. Internal migration is the changing of residence from one communal or geographic unit to another within the same region."[93]

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[92] Vide Chapter Three, "The Peopling of the Corn Belt" pp. 83-90

[93] Bogue, D.J, Shryock, H.S and Hoermann, S.A. "Subregional Migration in the United States", 1935-40" Vol.1, p.3. Scripps Foundation Studies in Population Distribution No.5. Miami University, Oxford, Ohio.1957.

Two further broad distinctions have been made by demographers. Firstly there is inter-regional migration, involving long distance movement, and secondly there is movement from urban to rural areas and vice versa, which may often be long distance, but which frequently is more localised.[94] Moreover within these two distinctions are further differentials based especially on the type of residence and the age, sex and colour of the group concerned. Furthermore the reasons for movements can be quite complex. Frequently a sound economic reason can be proposed but often the factors are more social and personal and no adequate statistics exist to summarise this kind of situation.

Previous research and sources of statistics

Research on internal migration has been relatively insignificant until quite recently for several reasons. Chiefly this has been because of the lack of suitable statistics and also because of the diversion of research work during the Second World War. The vast changes in population distribution in America after the war encouraged research into internal migration but much still remains to be done and there are as yet very few regional studies as attempted in this chapter.

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94. Vide "The Determinants and Consequences of Population Trends", p. 107, U.N.O., New York, 1953.

The first direct information was made available in the 1940 Census, when movement between 1935 and 1940 was recorded. In this census a migrant was defined as follows:

> "Migrants are those persons who lived in different counties (or quasi counties) in 1940 and 1935. [95]

Similar census registrations were made for the periods August, 1945 to October, 1946. [96] and [97]. and March, 1949 to March, 1950.[98]

Before 1940 however very few studies were made and those that were attempted were based on interpolation of movement by comparing the statistics of state birth with state of residence for a given population; a relatively crude measure of internal migration. Chief of these studies were those of Thornthwaite[99] and Galpin and Manny[100].

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95. U.S. Bureau of the Census, Census of Population, 1940. "Internal Migration 1935-40", Washington D.C. 1940. In this definition a city of 100,000 inhabitants was treated as a "quasi-county" and the remainder of the county in which it was located as a separate county.

96. U.S. Bureau of the Census, "Internal Migration and Mobility in the United States, 1945-46", Washington D.C. 1947.

97. U.S. Bureau of the Census, "Post War Migration and its Causes in the United States, 1945-46", Washington D.C. 1947.

98. U.S. Bureau of the Census, "Internal Migration and Mobility in the United States, 1949-1950", Washington D.C. 1951.

99. Thornthwaite, C.W. "Internal Migration in the United States", Study of Population Redistribution, Bulletin 1, University of Philadelphia, Pennsylvania, 1934.

100. Galpin C.J and Manny T.B, "Interstate Migration among the native white population as indicated by differences between state of birth and state of residence", U.S. Bureau of Agricultural Economics, Washington D.C. 1934.

A summary of the pre-1940 research on migration was presented by Lively at the Congrès International de la Population, in Paris in 1937.[101]

This early work was based on insufficient data and the findings were very generalised. The census of 1940 offered far more relevant statistical material but the war delayed its analysis and only recently has publication of research been achieved. In particular two series of publications have described characteristics of internal migration. The first was the Census Monograph Series,[102] published for the Social Science Research Council in co-operation with the U.S. Department of Commerce in the Bureau of the Census. These studies are however very general and deal with the United States as a whole. The second series was that of the Scripps Foundation Studies in Population Distribution at Miami University in Ohio.[103] These reports, which are still being published are at once more comprehensive and detailed but again offer little in the way of regional studies. They are moreover predominantly concerned with problems of methodology in statistical analysis as an introduction to more detailed research, and this is their chief significance.

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[101] Lively, C.E., "The Development of Research in Rural Migration in the United States", Congrès International de la Population Vol. IV. Paris, 1937.

[102] Vide Taeuber C and Taeuber I.B. "The Changing Population of the United States", Chapter 5, "Internal Migration", Census Monograph Series, Wiley, Washington D.C., 1958.

[103] Vide in particular Studies no's 1,3,4,5,6 & 12, which have particular reference to internal migration.

Finally, mention must be made of the research published by the U.S. Department of Agriculture[104] and the numerous regional agricultural experimental stations. These offer greater detail on movements of farm population in particular and are particularly useful for examining the differential movement of farm and non-farm population.

Problems of Calculating Internal Migration

Internal migration remains extremely difficult to measure in detail as there is still no direct census information. It is possible to calculate the total amount of migration by considering the changes in residence recorded by the census, but detailed information on the direction of movement and the overall pattern of migration has to be calculated with some degree of imperfection from other census data. Before these methods of interpolation are outlined some further points of definition and distinction must be made. Firstly the distinction between "gross" and "net" migration must be clarified.

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[104] Vide especially U.S. Department of Agriculture, Agricultural Marketing Service Statistical Bulletin no. 176. "Farm Population. Net Migration from Rural Farm Population 1940-1950." Washington D.C. 1956.

Gross and Net Migration

"Gross" migration refers to the total migration both in and out of a given area, that is the sum of population movement. This is an important concept in considering the total mobility of population in the Corn Belt.

"Net" migration represents the net balance of population movement in and out of a given area and to that extent it represents the change in the total population of the given area that is to be attributed to the effect of migration. The chief relevance of this is in the evidence it offers of the significance of migration as a demographic factor affecting population change. Obviously the two types of measurement have a different application, and there is a vast numerical discrepancy between them.[105]

Migration Rates

Frequently the actual amount of population movement, net or gross, is not as significant as the relation of this movement to the total population of the area involved. This relationship may be expressed as a ratio in the form of a "migration rate". The rate of migration is usually considered as the numerical amount of migration (net or gross) expressed as a fraction of the total population of the given area at

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105. For a brief discussion of the ratio of net to gross migration in the United States vide Thompson, W. "Population Problems", Chapter XIV, p.308.

the beginning, or less commonly, at the end of a given period. The rate of net migration therefore for a given area for the decade 1940 to 1950 represents the total net migration in the decade as a percentage of the 1940 population. This is expressed in the formula:-

$$R = \frac{x}{y} \times 100.$$

Where R = the rate of net migration, x = total net migration 1940-50 and y = the total population in 1940. The same formula would apply in the calculation of a gross migration rate, substituting the total movement for x instead of net movement.

Methods of Calculating Internal Migration

There are two main sources of migration statistics. Firstly there are those that may be obtained directly from the Census registration and secondly, there are methods of interpolating migration from the census data. These methods may usefully be reviewed in the light of their particular merits and shortcomings and especially in the context of the Corn Belt.

1. Methods based on Census Registration

(a) State of Birth compared with State of Residence

Census data since 1850 has contained statistics on state of birth and state of residence of persons enumerated in the census. This was first used as statistical evidence of migration by Galpin and Manny[106] and later by Thornthwaite[107]. Hart[108] has used the same method within the Corn Belt for the decade 1940 - 1950. Although some information on inter-state migration can be obtained by this method the value is qualified by two major omissions. Firstly the time at which the move was made, assuming that there was only one move, is not known, and secondly any intermediate move is not recorded. Since all that is known is the origin and destination of a movement without knowing when the movement took place or whether it involved one or more stages this method will not be developed in this study.

(b) Change of County of Residence

The 1950 Census contains data on a county basis of the number of people who lived in a different county in 1950 from that in which they were resident in 1949. This information has value as an index of total population mobility at a fixed time but unfortunately it is incapable of further refinement. It is impossible to differentiate between local and more long distance movement. It is however a useful means of delimiting areas of contrasted population mobility, and will be used as a starting point for more detailed study.

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[106] Galpin and Manny, Op. Cit. 100

[107] Thornthwaite, C.W. Op. Cit. 99.

[108] Hart, J.F. "Migration and Population Change in Indiana" Proceedings of the Indiana Academy of Science, Vol.66, 1956. Bloomington, Indiana. 1957.

2. Methods based on Interpolation of Census Data

(a) Comparison of Population Change and Vital Statistics

This is the most straightforward technique but is also the most lengthy and laborious. The method is to calculate the amount of migration by eliminating the other elements of population change. Briefly, this involves calculating for the given area the total population change and subtracting from this the net change by natural increase; the remainder is then assumed to be due to net migration. This method may be expressed by the following formula, for the decade 1940 - 50:-

$$M = I - E = P_2 - P_1 - (B - D)$$

Where M = net migration
I I = number of in migrants
E = number of out migrants
P_2 = 1950 population
P_1 = 1940 population
B = Number of births 1940 - 1950
D = Number of deaths 1940 - 1950

In order to make this method more accurate certain adjustments have to be applied, in particular:-

1. In the case of urban population the differences due to changes in definition between the censuses of 1940 and

1950 have to be corrected.

2. An adjustment must be made for under-registration of deaths.

3. College studentsmust be re-allocated due to the differences in enumeration in the 1940 and 1950 censuses.

4. Account must be taken of population included in annexations and retro-cessions to urban centres.

This method has been widely used and enjoys certain advantages. Firstly it can be applied to material that is readily available in the census reports and strict comparability over the nation is possible. Secondly, the formula itself is simple though lengthy. Thirdly, the method can be applied to quite small units of population in order to bring out detail and to indicate areas of loss and gain by migration.

The disadvantages are chiefly the large number of adjustments that have to be made, the fact that direction of movement is not indicated except by inference, and finally no breakdown is possible into the chracteristics of different groups as by residence, colour, age or sex. The chief value of the method is that it gives a general picture of net migration in the same way that the "change of residence" method indicates the general features of gross migration, and this will be its application in the present study. The statistics of net migration calculated by this method are available for the North Central States in published form.[109]

(b) Survival Ratios Method

The survival ratios method of interpolation of net migration is rather more complex. The stages in the process are indicated below.

1. The population at the beginning of the given period is obtained from the census figures.

2. The number of persons expected to survive to the end of the given period of those alive at the beginning is computed for each age group. This is calculated by applying a survival ratio for each age group based on a combination of census data andlife expectancy tables.

3. The population expected to survive to the end of the given period and the population that actually did survive are compared and the difference, positive or negative, is attributed to net migration.

The chief disadvantages of the method is again that direction of movement is not indicated, and can only be inferred. It does have the advantage however that it can

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109. Vide especially in connection with farm migration in the decade 1940-1950, Jehlik, P.J., and Wakely, R.E. "Population Change and Net Migration in the North Central States, 1940-1950", North Central Regional Publication No.56, Iowa State College, Ames, Iowa, 1955.

be applied quite easily to various population groups, farm, non-farm, white and nonwhite, provided that the base expected population is adjusted by using the appropriate survival ratio. In particular the method is of great value in considering age and sex differentials in net migration. Accordingly this method has been used by the U.S. Bureau of the Census in computing movement of farm population. These statistics have been published for the decades 1920-1930, 1930-1940 and 1940-1950.[110]

A lengthy discussion of the derivation of migration statistics was necessitated by the absence of published census material on migration and to establish how the statistics in the following maps and tables were obtained. The objectives of the analysis of population movement in the remainder of this chapter may be summarised as follows:-

1. An assessment of the total population movement in the Corn Belt and an indication of the degree of population mobility. This will be calculated by the change of residence method for the year 1949-50 for each county of the Corn Belt.

2. A description of the general characteristics of net migration, bringing out regional variations in loss and gain by migration and some of the contrasts between rural

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[110] "Farm Population, Net Migration from the Rural Farm Population, 1940-1950". United States Department of Agriculture Agricultural Marketing Service Statistical Bulletin, No.176 Washington D.C. 1956.

and urban net migration. The population change compared with vital statistics method will be used.

3. A detailed description and analysis of net migration by the survival ratios method. Particular attention will be focussed on the rural farm population and the effect of the loss of rural farm population on the age and sex composition. The whole problem of age and sex selectivity of migration will be reviewed in this section.

4. The significance of migration as a demographic factor influencing population growth and distribution will be studied in detail.

5. The causes of internal migration and especially the background to rural-urban migration will be summarised.

6. Attention was concentrated on the decade 1940-50 to indicate the more recent trends in migration. The significance of migration in the previous decades is summarised in the following chapter on population growth.

1. GROSS MIGRATION, THE MOBILITY OF THE CORN BELT POPULATION

The total movement of population in each county of the United States is recorded in the Census of 1950 by means of figures indicating change of residence in the year 1949-50[111].

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[111] Vide U.S. Bureau of the Census, Census of Population, 1950 vol.ii. *Characteristics of the Population*, Table 42. N.B. This is based on a 20% sample.

This gives an almost complete record of population mobility during the year on a county basis, the chief ommision being those persons who left the county but returned to it before the end of the year. Such transitory movement cannot be considered significant. Further detail is available on a state basis for the movement of rural farm, rural non-farm and urban population.[112.] From these two sources of statistics the actual numerical significance of movement can be obtained, some indication of urban-rural differentials inferred and migration rates can be calculated.

Table 58 indicates for each geographical region of the Corn Belt the number of people one year and older in 1950 that changed their residence in the year 1949-1950 and this is also shown as a gross migration rate.

For the Corn Belt as a whole the total population movement was 957,803 persons or 6.1% of the total population. This was a very high rate, and although there was a considerable variation in the numbers involved in migration in the various regions as a result of their contrasted size and population, nevertheless the rate of gross migration remained consistently high at approximately 5 - 7%.

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112. Vide Op.Cit 111. Table 23.

TABLE 58

GROSS MOVEMENT OF POPULATION IN THE CORN BELT, 1949-50

Geographical Region	Population over 1 year in 1950	Total movement 1949-50 (1)	Mobility Rate (2)	Composition of Population Urban	Rural Farm	Rural Non-Farm
East Central Lowland	4,715,800	267,623	5.7	59.9	16.6	23.5
West Central Lowland	3,748,745	241,495	6.4	46.3	28.3	25.4
Upper Missouri Valley	2,431,945	161,245	6.6	42.7	33.2	24.1
Lower Missouri Valley	1,452,250	114,720	7.9	67.4	16.7	15.9
Upper Mississippi Valley	1,118,520	57,235	5.1	55.5	22.0	22.5
Lower Ohio Valley	453,105	23,500	5.2	53.2	19.5	27.3
Lower Great Lakes	779,570	91,985	5.2	60.8	14.5	24.7
TOTAL CORN BELT	15,799,935	957,803	6.1	54.5	22.2	23.3

Source: Population movement calculated from U.S. Bureau of the Census, Census of Population 1950, volii. *Characteristics of the Population*, Table 42.

1. Movement is defined as persons, 1 year or older in 1950 who lived in a different county in 1950 as compared with their residence in 1949.

2. The mobility rate is calculated as the total movement in the region as a percentage of the total population of the region, 1 year or older in 1950.

The rate was highest in the predominantly rural regions suggesting loss of rural population to the urban centres. The highest rate of all occurred in the Lower Missouri Valley, 7.9% in a region which was predominantly rural.

The contrasts between urban and rural mobility can be shown by reference to selected states, as shown in Table 59.

TABLE 59

GROSS POPULATION MOVEMENT FOR SELECTED CORN BELT STATES, 1949-1950, URBAN AND RURAL

	Indiana	Iowa	Nebraska
Total Population over 1 yr. in 1950	3,833,780	2,572,956	1,291,920
Gross Population Movement	220,560	156,760	91,760
Gross Migration Rate	5.7	6.1	7.1
Movement of Rural Farm Popn.	27,960	33,675	17,545
Movement of Rural Non-Farm	62,070	39,510	26,520
Movement of Urban Population	130,530	83,575	47,695
Gross rural farm migration rate	4.3	4.4	4.6
Gross rural non-farm migration rate	7.0	6.9	8.7
Gross urban migration rate	5.7	6.8	7.9
% of state population rural farm	18.3	29.9	29.6
% of state population rural non-farm	22.7	22.4	23.6
% of state population urban	59.0	47.7	46.8

Source: Calculated from U.S. Bureau of the Census, Census of Population, 1950, Vol.11. Characteristics of the Population. Table 10 and 23.

From Table 59 it is seen that the highest gross migration rate was found in Nebraska, the most rural of the three states, while Indiana, the most urban had the lowest rate. By adding the farm and non-farm elements it is obvious that in all cases the rural migration rate was well in excess of the urban migration rate, though the numbers involved were fewer.

The calculation of gross migration can be extended to all the Corn Belt by the concept of an Index of Mobility. This index based on total population movement is useful for bringing out the detailed variation in population mobility in the Corn Belt. The Index of Mobility is derived by the following formula:

$$I = \frac{x}{y} \times 100$$

Where I = Index of Mobility; x = Population resident in a given county in 1949 that was resident in a different county or abroad in 1950; y = Population resident in the given county of 1 year or older in 1950.

This index has been calculated for each county of the Corn Belt and plotted in Map 39 in an attempt to show the regional variations in population mobility.

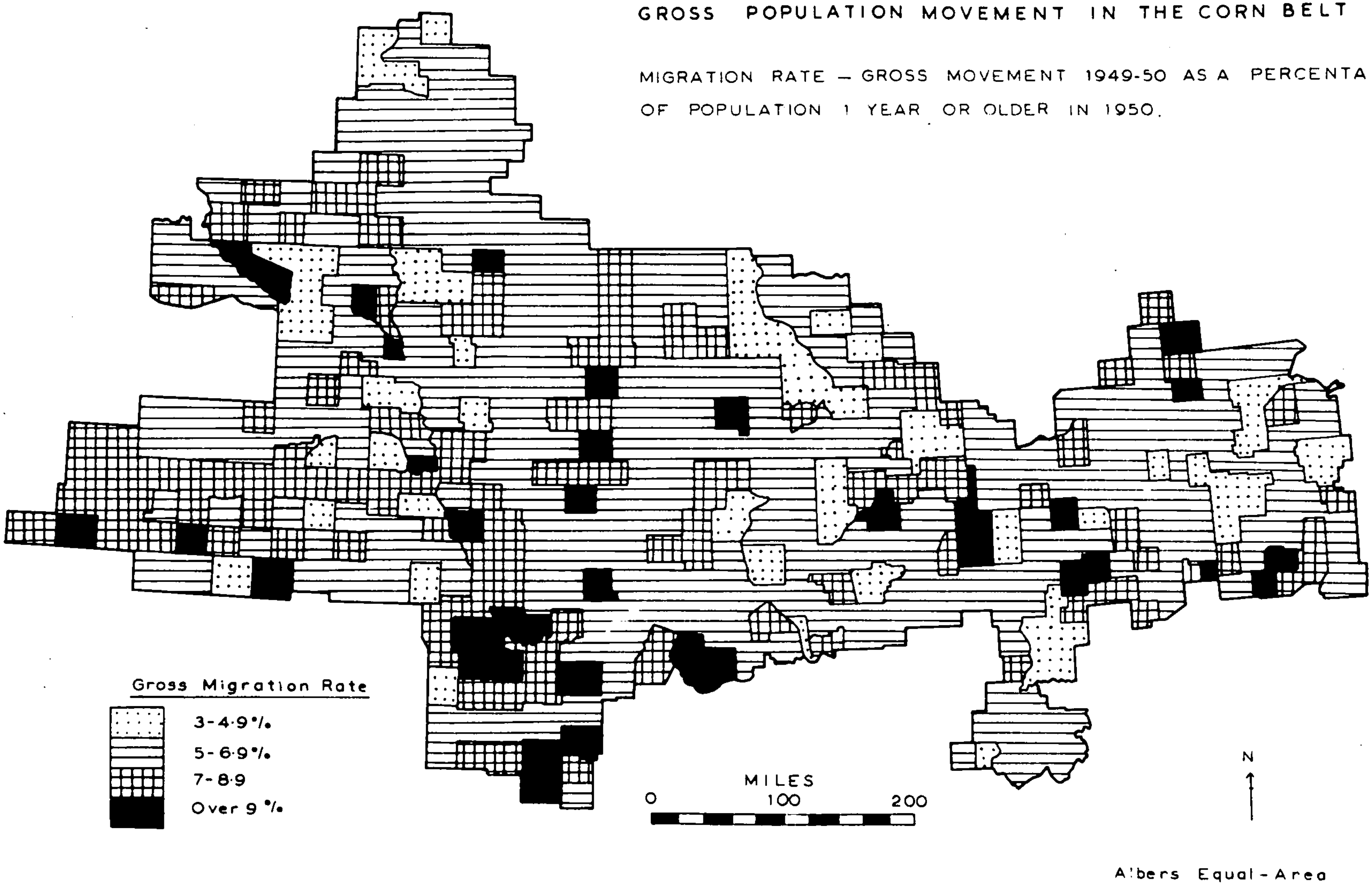
1. Areas with very high mobility (Index over 9)

(a) The counties containing the larger urban

MAP. 39.

GROSS POPULATION MOVEMENT IN THE CORN BELT

MIGRATION RATE — GROSS MOVEMENT 1949-50 AS A PERCENTAGE OF POPULATION 1 YEAR OR OLDER IN 1950.


Gross Migration Rate
3-4·9%
5-6·9%
7-8·9
Over 9%
MILES
0
100
200
N
Albers Equal-Area

areas stand out as areas of very high mobility, and frequently in the case of the very large cities, for example Kansas City, the adjacent counties also have a very high index.

(b) The antithesis of this situation is apparent in the very high indices found in the predominantly rural areas with very low population densities, especially in S. Dakota and Nebraska.

(c) Rural counties in areas of low population density with a less productive agriculture on the margins of the Corn Belt. This is the case in Central Missouri.

2. Areas of High Mobility (Index 7 - 9)

(a) Areas of the Eastern Central Lowland and Lower Great Lakes adjacent to the large cities and containing many smaller cities.

(b) Very large areas of low population density and extensive farming in Nebraska and South Dakota.

3. Areas of Low Mobility (Index 3 -5)

(a) Areas of highly productive intensive farming in close proximity to urban centres, especially in West Central Ohio, Wabash Valley, and the prairie counties of Illinois.

(b) The rural counties of the Missouri and Mississippi Valleys in areas of low population density and where a large proportion of the population is resident on farms.

Summary and Conclusions on Population Mobility and Gross Migration

1. The Corn Belt population was highly mobile on the evidence of the year 1949 - 1950. Over 75% had a gross migration rate exceeding 5%.

2. Urban areas stood out as focal points of population movement as were rural areas with extensive forms of agriculture. This suggests a functional relationship in the migration of rural population to the towns of the Corn Belt.

3. Rural areas close to towns also stood out as areas of high mobility, and in this case it is probable that it was the non-farm element that was involved in a movement to the towns in search of employment. However numerous rural counties close to urban centres with more intensive forms of agriculture, especially mixed farming and dairy on the till plain and prairies of the East Central Lowland and Central Illinois had a very low mobility reflecting a form of agriculture with higher per acre labour input and a more stable farm population based on the family farm unit.

4. Areas of poorer farming, and poorer living conditions, often with a higher negro population in the southern fringe areas of the Corn Belt had a very high migration rate. This applied especially to Central Missouri and Southern Indiana which it will be shown were areas of heavy rural depopulation.

Having indicated the general characteristics of gross migration it is necessary to consider the relative loss and gain of population by migration in the Corn Belt.

2. CHARACTERISTICS OF NET MIGRATION IN THE CORN BELT, 1940 - 1950

In an analysis of net migration it is necessary to consider a longer period than one year. Firstly this is necessary for methodological reasons in that net migration statistics are calculated by comparing statistics from successive censuses, and secondly it is necessary to take a longer period in order to average out exceptional conditions. Accordingly the decade 1940 - 1950 has been chosen since these represent the last two available censuses. The method of calculation followed was the population change compared with vital statistics method as described above.

In order to obviate repetition of the rather lengthy formula involved, the breakdown by State Economic Areas has been adopted. This permits regional comparison of migration rates within the Corn Belt, and the use by the Census of the State Economic Area for much of its enumeration facilitates comparison with other related demographic features. For purposes of tabulation the thirteen Economic Subregions have been used within which framework the State Economic Areas basis has been used for cartographic representation.

Net Migration in the Corn Belt during the decade 1940 - 1950 is indicated for the Economic Subregions in Table 60. For each region the balance of in and out migration is indicated as a value and as a net migration rate.

TABLE 60

NET MIGRATION IN THE CORN BELT 1940 - 1950, BY ECONOMIC SUBREGION

Economic Subregion	Total Net Migration	Rate of Net Migration[1]
Central Indiana, S.W. Ohio	211,556	7.9
N. Indiana, S.Michigan, N.W. Ohio	28,976	1.9
Ohio and Lower Wabash Valley	-44,111	-5.8
Illinois Prairie	12,621	1.0
Upper Mississippi	-42,297	-3.9
Middle Mississippi	-29,257	-2.5
S. Iowa, N. Missouri	-133,500	-12.3
W. Missouri, E. Kansas	-46,662	-13.3
Missouri Valley	-77,683	-3.1
N.C. Iowa	-60,514	-7.9
S.W. Minnesota, S.E.S. Dakota	-39,748	-14.3
Central Nebraska	-60,813	-14.9
S. Nebraska, N. Kansas	-54,362	-16.1

TOTAL NET MIGRATION FROM THE CORN BELT, 1940-1950 = 335,794

Source: "Population Change and Net Migration in the North Central States, 1940-1950". Appendix A. Op. Cit.109.

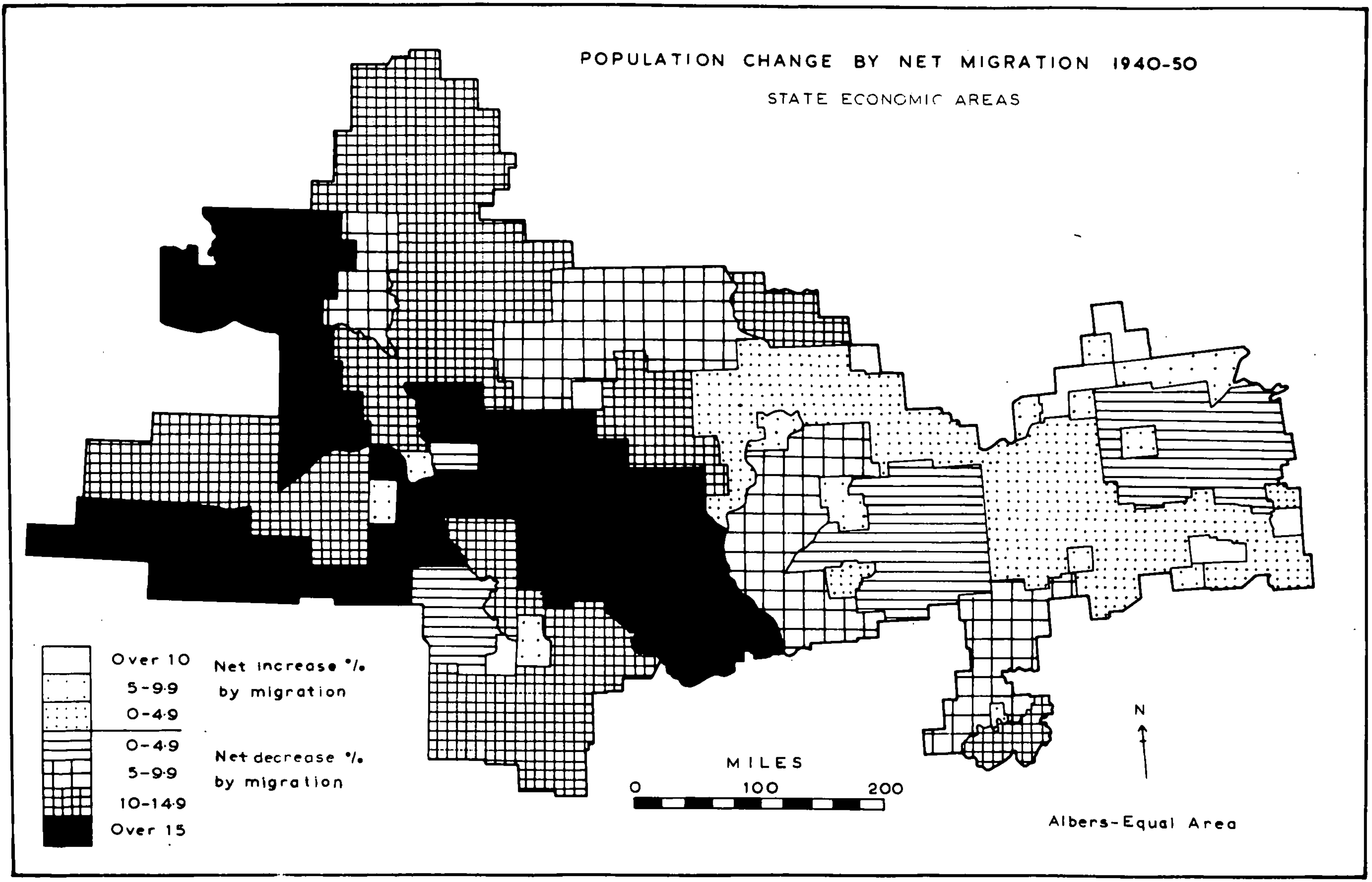
1. Net change in population 1940-1950 due to migration as a percentage of the 1940 population.

In the decade there was a net loss in the area defined as the Corn Belt in 1950 of 335,794 persons. However the significance of net migration varied regionally. The highest net gain and by far the highest rate of increase by net migration occurred in Central Indiana and South West Ohio an area with a high urban proportion. The only other subregions which gained by migration were the contiguous regions to the north and west, and these had only a very low rate of increase. Elsewhere the subregions of the Corn Belt have experienced a loss of migration with a tendency for this loss, especially in terms of the rate, to be highest in the western subregions of the Corn Belt.

It is considered that the actual numerical change by migration is less significant than the rate at which this change is taking place and in the detailed analysis of net migration based on the State Economic Areas emphasis will be placed on the rate of change by net migration.

Map 40 illustrates the rate of population change by net migration in the Corn Belt. The rate is calculated as the numerical change in population due to migration, 1940 - 1950 as a percentage of the 1940 population. It is possible to delimit from Map 40 the distribution of the areas of net loss and net gain by migration and then to examine each area in more detail.

MAP. 40.



POPULATION CHANGE BY NET MIGRATION 1940-50

STATE ECONOMIC AREAS

Over 10
5-9·9
0-4·9
Net increase %
by migration
0-4·9
5-9·9
10-14·9
Over 15
Net decrease %
by migration
MILES
0
100
200
N
Albers-Equal Area

1. Areas of Net Increase by migration

Areas of increase by net migration were very limited geographically. They included the margins of the Great Lakes and the hinterland of Chicago and two areas contiguous to this lateral zone. These were firstly, West Central Indiana and South West Ohio and secondly, a zone extending from the Chicago Fringe across North Central Illinois and into South East Iowa. In addition numerous small areas containing very large cities outside the areas delimited above had an increase in population by net migration. These were the State Economic Areas containing Evansville, Kansas City, Des Moines, Lincoln, Omaha, Springfield,(Illinois), Peoria and Fort Wayne.

2. Areas of Net Decrease by migration

The remainder of the Corn Belt, that is by far the greater geographical area, experienced a decrease by net migration in the decade 1940 - 1950. In terms of the distribution this involved practically all of the Corn Belt west of the Wabash with the exception of a broad strip of Northern Illinois and South West Ohio together with the State Economic Areas of the towns listed above. It also included a large proportion of the till plain of North West Illinois and North East Ohio.

Detailed Variation in Areas of Net Increase by migration

It is obvious from Map 40 that increase by net migration was restricted to areas of urban development and the occurrence of significant increase over 10%, due to net migration was restricted to the very large towns. The larger areas experiencing an increase by migration only did so at a low rate of increase, from 0 - 4.9%. The highest rates of increase by net migration occurred in the large cities with considerable and expanding industries; Kansas City, Columbus (Ohio), Dayton, South Bend, Battle Creek and Rockford. These areas of very high increase tended to be encircled by areas of moderate increase by net migration, of from 5 - 9.9% which in turn gave way to areas of low increase or even decline by net migration. The areas of moderate increase were still however predominantly urban, and contained a larger number of smaller industrial towns.

Detailed Variation in the Areas of Net Decrease by migration

Contiguous to the distribution noted above as being a zone of increase by net migration coinciding with the urbanised eastern sector of the Corn Belt were two areas of low decrease by migration. These rural areas were N.E. Indiana and N.W. Ohio and the Illinois Prarie cash grain area. These were both areas of intensive and highly productive agriculture.

To the west of the latter area, extending as far west as the Mississippi was an area of moderate decline by net migration. This area of West Central Illinois was predominantly rural but contains a large number of small towns, many with significant light industries which have the effect of reducing the decrease by migration by keeping the rural out-migration within the area. Thus although the loss of total migration was not high, the loss of rural population within the area may have been quite high.

A great change occurred approximately along the line of the Mississippi Valley. West of the Mississippi only isolated large urban centres experienced an increase by net migration in the decade. The only exception was the area noted above of S.W. Iowa which experienced a moderate population increase by migration. This again was related to the distribution in the area of a large number of towns with an increase by net migration which offset the loss of rural population in the area. These towns included Iowa City, Dubuque, Burlington, Cedar Rapids and Clinton, together with the urbanised area of Rock Island - Davenport. Elsewhere west of the Mississippi the pattern was one of almost unrelieved heavy loss of population by net migration. This loss was at a very high rate and over vast tracts of N. Missouri, S. Iowa, S. Dakota and Kansas and Nebraska exceeded 15%.

Summary and Conclusions on Net Migration 1940 - 1950

1. The Corn Belt as a whole experienced a net loss by migration during the decade 1940 - 1950 of some 335,794 persons.

2. Net Migration varied enormously within the Corn Belt but there was a fundamental distinction between the areas east of the Mississippi, which contained large areas of net increase by migration associated with the predominantly urban character, together with the significant rural areas with a moderate decrease by migration, and the area west of the Mississippi which experienced a univeral loss of population by migration at a very high rate with the exception of a few isolated areas.

3. High rates of increase by net migration only occurred in the larger industrial cities.

4. High rates of decrease by migration occurred over a much larger area which tended to be either; (a) an area containing few towns within the State Economic Area, which could absorb rural out-migration; (b) areas of extensive or lower productivity agriculture.

5. The distribution of towns appeared to be the chief influence on regional variations in migration. It should also be mentioned that some of the movement of population from rural areas to towns was undoubtably external in origin,

especially in the case of movement of rural population from the areas to the south into the Corn Belt towns.

6. Obviously the juxta-position of urban zones of increase by net migration and rural zones of net decrease by migration indicates that rural-urban migration is predominant in the Corn Belt. It is necessary therefore to pursue this further by examining in detail the major differentials of rural and urban migration.

3. DIFFERENTIAL CHARACTERISTICS OF RURAL AND URBAN MIGRATION

The statistics for rural and urban migration are summarised in Table 61 on the basis of economic sub-regions.

The major contrast between urban and rural migration has been that urban migration has been almost exclusively net gain and rural migration almost entirely net loss. Moreover, Table 61 indicates that when rates are considered, the rate of loss of rural population by net migration has been much higher than the rate of increase by migration in the urban centres and therefore the implications are more serious in the case of rural areas. It is convenient to consider the two groups separately initially and then indicate their inter-relationship.

Characteristics of Urban Migration, 1940 - 1950

Table 61 indicates that in all the sub-regions of the

TABLE 61

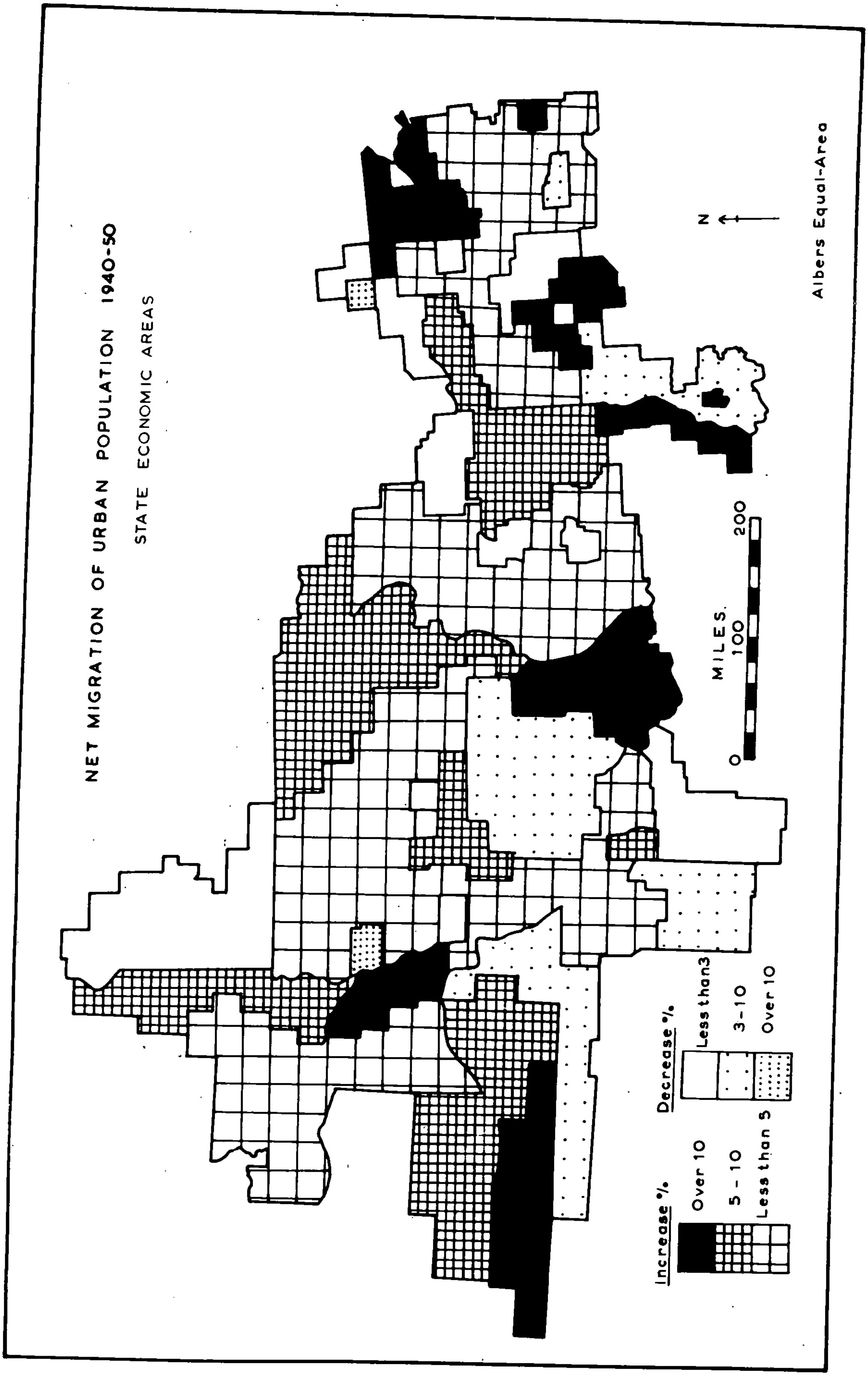
MIGRATION AS A FACTOR IN POPULATION GROWTH IN THE CORN BELT, 1940 - 1950

Economic Subregion	Total Population change	Change in rural population	Change in urban population	Migration Rate Total	Migration Rate Rural	Migration Rate Urban
47	211,556	168,522	43,064	7.9	16.4	2.6
48	28,976	21,468	7,508	1.9	2.4	1.2
51	-44,111	-54,896	10,785	-5.8	-12.6	3.3
63	12,621	1,057	11,564	1.0	0.2	1.9
69	-42,297	-68,880	26,583	3.9	-10.2	6.5
70	-29,257	-52,492	23,235	-2.5	-9.0	4.1
71	-133,500	-141,834	8,334	-12.3	-18.4	2.6
84	-46,662	-45,112	-1,550	-13.3	-17.4	-1.7
85	-77,683	-110,888	33,205	-3.1	-10.3	2.3
86	-60,514	-64,025	3,511	-7.9	-14.1	1.1
87	-39,748	-40,519	771	-14.3	-17.5	1.7
92	-60,813	-65,029	4,216	-14.9	-19.7	5.3
93	-54,362	-57,760	3,398	-16,1	-20.3	6.3

Sources: Jehlik and Wakely *Op. Cit* 109. Tables A1, A2 and A3

Corn Belt urban population was increased by net migration in the decade 1940 - 1950. The only exception was in a small area of Missouri South East of Kansas City. Moreover the loss in this latter area was only 1,550 persons and probably reflected the regional dominance of Kansas City. This overall picture can be further refined and detailed variations can be indicated. Map 41 shows the variations in the rate of urban migration on the basis of State Economic Areas. Although the highest numerical gains were seen in Table 61 to occur in the East Central Lowland and Great Lakes Margin, in actual fact Map 41 shows that the highest rates of increase were well distributed throughout the Corn Belt and were not always associated with the largest cities. Map 41 indicates that the largest rates of increase by net migration took place in the smaller cities and towns of predominantly rural areas as S. Nebraska, N. Missouri and Eastern Nebraska. Since these areas can hardly have attracted population from outside the Corn Belt in the way that many of the larger regional cities may have done, this is conclusive evidence of a drift of rural population to urban centres within the Corn Belt. Moreover those areas of intensive agriculture in the northern till plain of N. Indiana and N.W. Ohio and the prairie lands of Illinois which were shown to have a net loss in total population by migration are shown in Map 41 to have

MAP 41.



NET MIGRATION OF URBAN POPULATION 1940-50

STATE ECONOMIC AREAS

Increase %
■ Over 10
▦ 5 - 10
▢ Less than 5
Decrease %
▢ Less than 3
⁘ 3 - 10
⁙ Over 10
MILES
0
100
200
N
Albers Equal-Area

experienced a gain in urban population by migration; further evidence of a drift of population from rural areas. Finally, certain, but by no means all of the major cities of the Corn Belt experienced heavy gains by migration, in particular Evansville, Columbus (Ohio), Lincoln, Topeka and the towns of the Illinois prairie and S.W. Iowa.

Map 41 also indicates that quite a large number of smaller areas have experienced a loss of urban population by migration. These include areas adjacent to very large cities, for instance in the vicinity of Kansas City, Omaha, and more especially Chicago. Also included in this category are areas of low total population density which have experienced a heavy loss in total population by migration and which is apparently not confined to the rural element; including N. Missouri and S.W. Minnesota. A third situation is that in which the decline in urban population due to migration was related to economic decline in staple industries. This applied particularly to the Lower Wabash Valley in South West Indiana. This is an area in which the changeover from shaft to strip coal mining has reduced the amount of employment in the coal mining industry and resulted in considerable out-migration from the urban centres.[113]

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[113] Vide. Barton, T.F. Op. Cit. 69.

Finally many of the larger cities of the Corn Belt have experienced loss by migration in their State Economic Area. This is by no means an uncommon feature in modern urban geography and is explained by the moving out of population from the Central City into the surrounding rural-urban fringe within commuting distance of the city. This is especially the case in Indianapolis, Dayton, Toledo, Peoria, Decatur, Kansas City and the cities of the Great Lakes Margin.

This last phenomenon is worthy of expansion since it is a trend of increasing significance and presents many problems. The characteristics of migration in the large urban centres can be illustrated by reference to the Standard Metropolitan Areas of the Corn Belt. These features are summarised in Table 62. In particular distinction must obviously be made between the characteristics of migration in the Central City and the Metropolitan Ring, that is, the remainder of the Standard Metropolitan Area.

In Table 62 Column A shows the total net migration and it is apparent that the overwhelming majority of Standard Metropolitan Areas experienced a loss of population by migration from their central cities; by as much as over 20,000 in the case of Indianapolis and Toledo. This phenomenon represents the expansion of the rural-urban fringe around the Central City and the contraction of

TABLE 62

NET MIGRATION IN THE STANDARD METROPOLITAN AREAS OF THE CORN BELT, 1940-1950

A. TOTAL MIGRATION

Standard Metropolitan Area	A Total Net Migration (1) Central City	 Metropolitan Ring	B Migration Rate (2) Central City	 Met. Ring
Cedar Rapids	3,570	2,302	5.8	8.4
Columbus	15,498	36,902	4.9	45.2
Davenport-Rock Island-Moline	-2,441	13,908	-1.7	25.6
Dayton	-12,486	80,978	-5.9	67.4
Des Moines	-2,261	9,769	-1.4	27.3
Hamilton-Middletown	-7,092	13,047	-8.8	31.0
Fort Wayne	-714	8,033	-0.6	22.1
Indianapolis	-22,650	50,364	-5.9	68.6
Kalamazoo	-9,124	18,730	-16.1	40.9
Kansas City	-2,326	56,170	-0.6	19.7
Lincoln	2,362	2,135	2.7	11.6
Omaha	-3,014	6,706	-1.4	6.7
Peoria	-7,044	20,481	-6.7	19.4
Rockford	-5,432	19,620	-6.4	54.3
Sioux City	-8,199	-3,587	-10.0	-17.1
South Bend	-143	16,373	-0.1	25.6
Springfield, Illinois	-2,490	5,168	-3.3	12.3
Springfield, Ohio	-2,998	6,123	-4.2	24.8
Terre Haute	-5,956	1,263	-9.3	3.4
Toledo	-20,339	30,322	-7.2	49.5
Topeka	378	5,895	0.6	25.5
Waterloo	-1,187	7,646	-2.3	25.3

(1) Table IV

(2) Table III

TABLE 62 CONTINUED......

B. SEX COMPOSITION OF WHITE MIGRANTS

Standard Metropolitan Area	C Total White Migration(3) Male	 Female	D Sex Ratio of white migrants (4)
Cedar Rapids	2,897	2,881	100.0
Columbus	21,720	22,307	97.4
Davenport-Rock Island-Moline	4,906	5,649	86.9
Dayton	25,800	28,829	89.6
Des Moines	2,588	3,904	66.4
Hamilton-Middletown	1,974	3,974	60.6
Fort Wayne	2,226	2,850	78.0
Indianapolis	7,863	11,713	67.0
Kalamazoo	3,379	5,025	67.2
Kansas City	17,620	20,937	84.1
Lincoln	2,010	1,948	100.3
Omaha	1,445	-1,617	-
Peoria	5,517	5,110	108.0
Rockford	5,554	6,413	86.9
Sioux City	-5,898	-5,981	-
South Bend	7,431	4,411	160.8
Springfield, Illinois	373	1,533	24.3
Springfield, Ohio	742	1,843	40.2
Terre Haute	-2,664	-2,313	-
Toledo	82	781	10.5
Topeka	3,148	2,454	128.5
Waterloo	2,321	3,401	68.3

Source: D.J. Bogue, "Components of Population Change", Scripps Foundation for research in Population Distribution, No. 12.

(3) Table V
(4) Calculatedfrom Table V

the residential section of the central city.

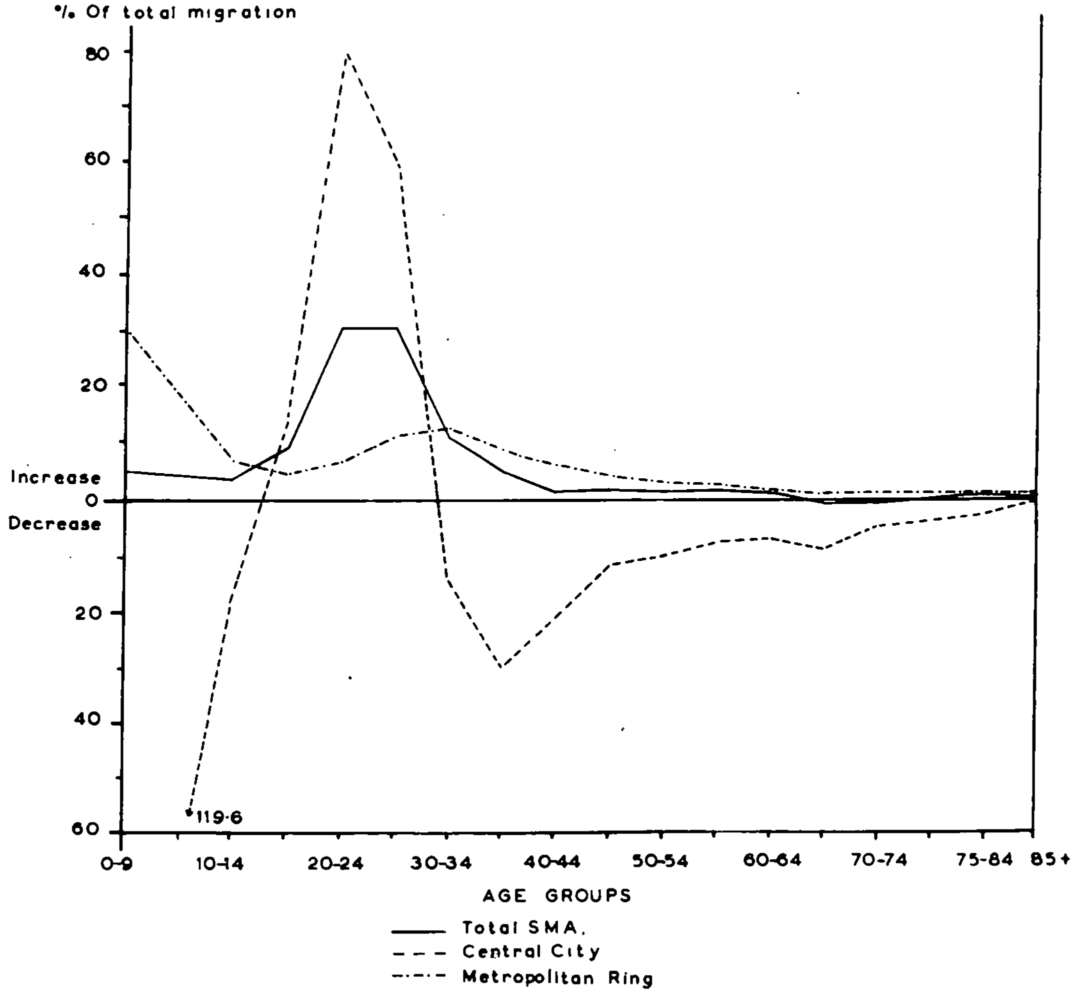
In the case of the metropolitan ring of the Standard Metropolitan Areas the gain by migration was enormously high. This implies that this gain cannot be explained solely in terms of the out-migration from the central city. It represents in addition, the influx of population from adjacent rural areas into the rural-urban fringe, where as rural-non farm residents these persons are located within commuting distance of the central cities. Column B shows these contrasted situations as rates. The rate of increase by migration in the Metropolitan Rings was frequently over 25% and exceptionally over 50% in the decade while the central cities lost population by migration less consistently, but in many cases by over 5%.

Finally Columns C & D show the sex differentiation of this migration. In this there was considerable variation and no generalisation is possible beyond the fact that there was a marked tendency in most instances for a very low sex ratio in the total migrants to the Standard Metropolitan Areas. In other words many more women than men were involved in the influx of population into the metropolitan rings.

A further differentiation can be made on the basis of age structure. Diagram 27 indicates the total

DIAG. 27.

TOTAL MIGRATION BY AGE GROUPS IN THE STANDARD METROPOLITAN AREAS 1940-50



migration by age groups for the total Standard Metropolitan Areas, for the Central Cities and for the Metropolitan Rings.[114] Each curve must be evaluated separately and for each age group the proportion of the total migration appropriate to that age group has been plotted. In other words the plottings of each line sum 100%.

Considering the Standard Metropolitan Areas as a whole there was a gain by migration in all age groups until the ages 60 - 64 after which the situation stabilised. The peak gain was in the age group 19 - 35, that is at the age of first employment and early married life and involving the influx of migrants from rural areas of smaller towns in search of the greater opportunities offered in the larger cities.

In the case of the Metropolitan Ring the pattern was rather different. There was a much more regular trend in migration by age groups with no well-marked peak, but a similar preponderance in the earlier age groups up to age 40.

Finally in the case of the Central City there was a vast emphasis on increase by migration in the earlier age groups. 80% of the migration to the Central City occurred in the age group 20 - 24 years, after which there was a rapid decline and eventually a substantial decline by migration in the age groups above 30 years. In other words the vast influx of population to the Central Cities was overwhelmingly of young people, most of whom it must be assumed found work in the Central City.

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[114] Figures are calculated from Bogue D.J. "Components of Population Change", Scripps Foundation for Research in Population Distribution, Study No.12. Table IIID, Page 39, Miami University, Ohio, 1958.

In summary, almost all the Standard Metropolitan Areas experienced an increase in population by migration in the decade 1940 - 1950. This gain was very high in almost all the Metropolitan Rings but most Central Cities lost population through net migration. So high was the gain by most Metropolitan Rings that much of this gain must have come from the surrounding rural area. The migrants tended to have a low sex ratio, with a very marked female preponderance. There was a tendency for the migrants to be in the lower age groups, especially in the case of the Metropolitan Rings. This conforms with the observed pattern of movement of rural population to the large towns, and especially to the rural-urban fringe, where it forms a rural non-farm element associated functionally with employment in the Metropolitan Area. This movement has been shown to involve particularly the younger age groups and is associated with the employment opportunities of the towns.

Summary and Conclusions on Net Migration of Urban Population, 1940-1950

1. In the case of the total urban population of the Corn

Belt there was a considerable gain in population by net migration in the decade 1940 – 1950 though there were cases of individual cities losing slightly by migration.

2. The highest rates of increase by net migration were experienced in the smaller cities located in predominantly rural areas whilst the highest numerical gain was in the larger urbanised areas.

3. There is evidence that this urban gain by migration was at the expense of the surrounding rural areas.

4. It is likely that economic factors were the chief causative considerations particularly the matter of employment. In certain cases there were very specific economic factors of regional importance, as for instance the decline of coal mining in the Eastern Interior Coalfield.

5. It is quite common for the larger cities to have lost population by net migration to the surrounding rural-urban fringe within easy commuting distance.

An analysis of the detailed characteristics of rural population movement throws further light on the mechanics of rural-urban migration.

Characteristics of Net Migration of Rural Population, 1940-1950

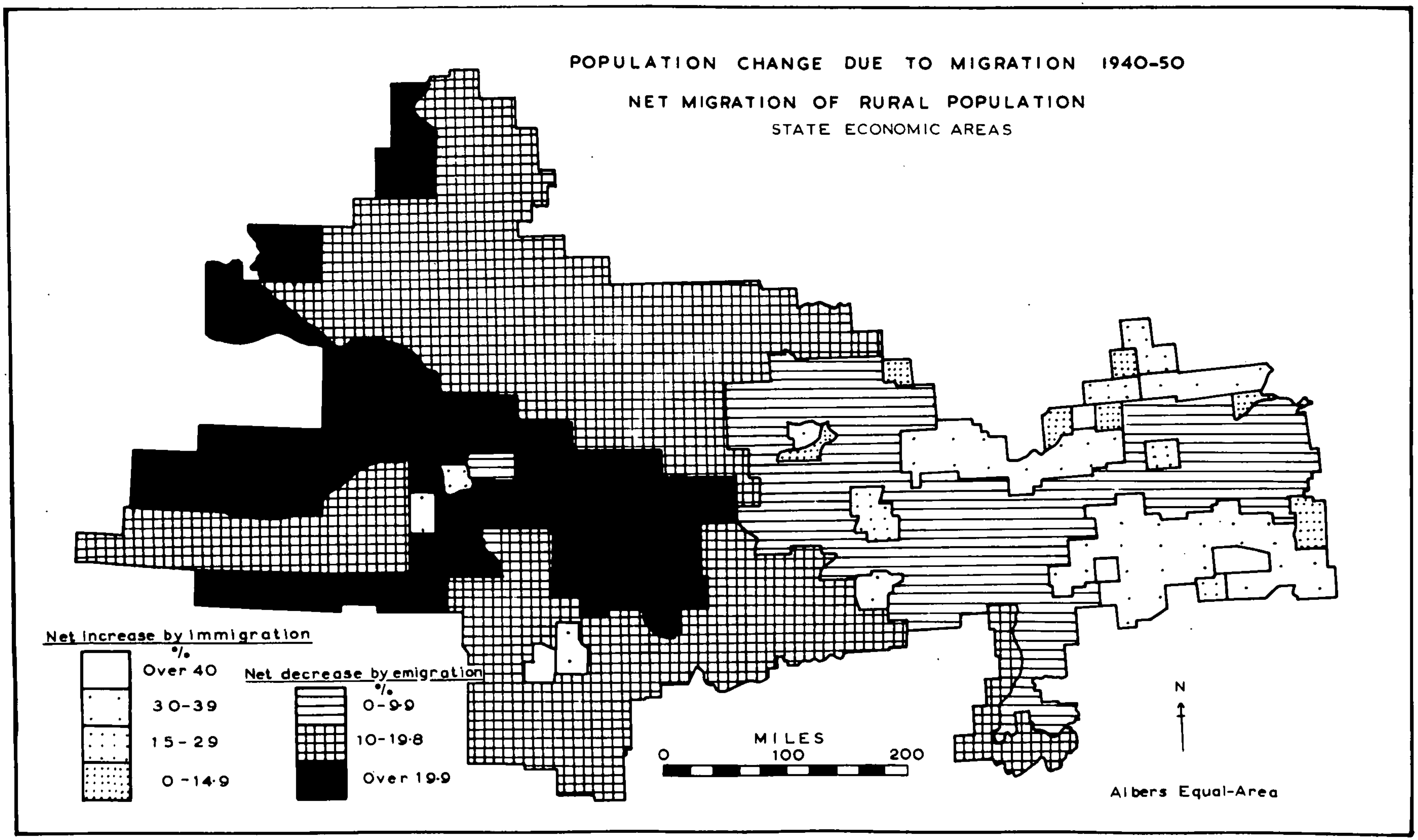
Table 61 indicated a significant loss of rural population by net migration throughout the Corn Belt, with the exception of three adjacent Economic Subregions of Central Illinois, North Central Indiana and North West Ohio. The regional pattern was thus one of a contrast between an eastern section of increase in rural population by migration coinciding with the most urbanised sector of the Corn Belt, and a western and southern section, comprising almost two-thirds of the Corn Belt which experienced heavy loss of rural population by net migration in the decade. Moreover the rates of loss by migration in this later area were particularly high; between 10 and 20% during the decade. This pattern is examined in more detail in Map 42.

Map 42 indicates that only a very restricted area of the Corn Belt experienced an increase in rural population by net migration during the decade 1940 - 1950. These areas were very clearly demarcated and were exclusively areas adjoining large urban centres.

1. The Great Lakes Margin from Illinois to Toledo.
2. Southern Indiana and South Western Ohio along the axis Indianapolis, Dayton, Columbus.
3. The isolated counties containing large urban centres, especially Kansas City, Omaha, Rock Island, Lincoln, Decatur, Peoria, Fort Wayne and Rockford.

This spatial coincidence with large urban centres

MAP 42.



POPULATION CHANGE DUE TO MIGRATION 1940-50

NET MIGRATION OF RURAL POPULATION

STATE ECONOMIC AREAS

Net Increase by Immigration
%
Over 40
30-39
15-29
0-14·9
Net decrease by emigration
%
0-9·9
10-19·8
Over 19·9
MILES
0
100
200
N
Albers Equal-Area

was related to the rural-urban movement of population. Not only is farming sufficiently profitable close to the large cities to check in part the drift from the land, but the situation close to cities with large employment opportunities has attracted population from more distant rural areas to rural residence within commuting distance of the cities and this in-migration was essentially rural-non-farm. This raises the question of farm and non-farm differentials in the movement of rural population.

Farm-Non-Farm Differentials in Net Migration of Rural Population

A statistical difficulty arises in the attempt to examine farm-non-farm differential characteristics. No census figures are published for the rural non-farm migration, though a comparison of rural farm statistics with total rural migration facilitated an estimation. However it has been indicated that the rural farm statistics and those of total rural migration were calculated by different methods and are not therefore strictly comparable statistically. It would be possible to calculate rural non-farm migration by the survival ratios method, but this would be far too lengthy an operation. It is proposed therefore to derive the rural non-farm migration figures from a comparison of the total rural migration and the rural farm migration statistics, both of which are published.

The statistical discrepancy involved is not great and values for sub-regions only have been calculated since a detailed analysis would be equivocal. Moreover such figures and rates must be regarded as indicators, though sound ones, of the general trend.

Table 63 indicates the major differential characteristics between farm and non-farm population by Economic Subregions.

Certain major contrasts are evident on the regional scale:-

1. The loss of rural farm population by migration was universal and occurred at a high rate, varying from -19.1% to -31.7%.

2. By contrast, the rural non-farm population increased by net-migration in all sub-regions but four, all of low total population density; Eastern Nebraska, Northern Kansas; Northern Missouri; Southern Iowa; East Central Illinois and Eastern Kansas.

3. The increase in rural non-farm population by net migration was part of the general drift of rural population to urban occupations, since a large proportion of the rural non-farm was related functionally to urban occupations.

TABLE 63

RURAL POPULATION CHANGE DUE TO NET MIGRATION, 1940-50

Economic Subregion	Total rural change (1)	Change in rural farm (2)	Change in rural non-farm (3)	Rates of Change All Rural	Rates of Change Rural Farm	Rates of Change Rural Non-Farm
47	168,522	-93,000	262,000	16.4	-20.9	37.3
48	21,468	88,000	109,000	2.4	19.1	21.5
51	-54,896	-56,000	1,000	-12.6	-26.9	14.3
63	1,057	-73,000	74,000	0.2	-27.8	28.0
69	-68,880	-94,000	25,000	-10.0	-24.8	14.8
70	-52,492	-76,000	24,000	-9.0	-24.2	15.2
71	-141,834	-112,000	-30,000	-18.4	-25.5	-7.1
84	-45,112	-39,000	-76,000	-17.4	-25.1	-7.7
85	-110,888	-161,000	50,000	-10.3	-28.2	18.1
86	-64,025	-72,000	8,000	-14.1	-26.9	12.8
87 87	-42,519	-41,000	500	-17.5	-28.3	10.8
92	-65,029	-60,000	-5,000	-19.7	-30.6	-10.9
93	-57,760	-51,000	-7,000	-20.3	-31.7	-11.4

Sources:
1. "Population Change and Net Migration", Jehlik and Wakeley, Op. Cit 109 Table A3
2. U.S. Department of Agriculture, "Farm Population", Table 7.
3. Calculated from Columns 1 and 2

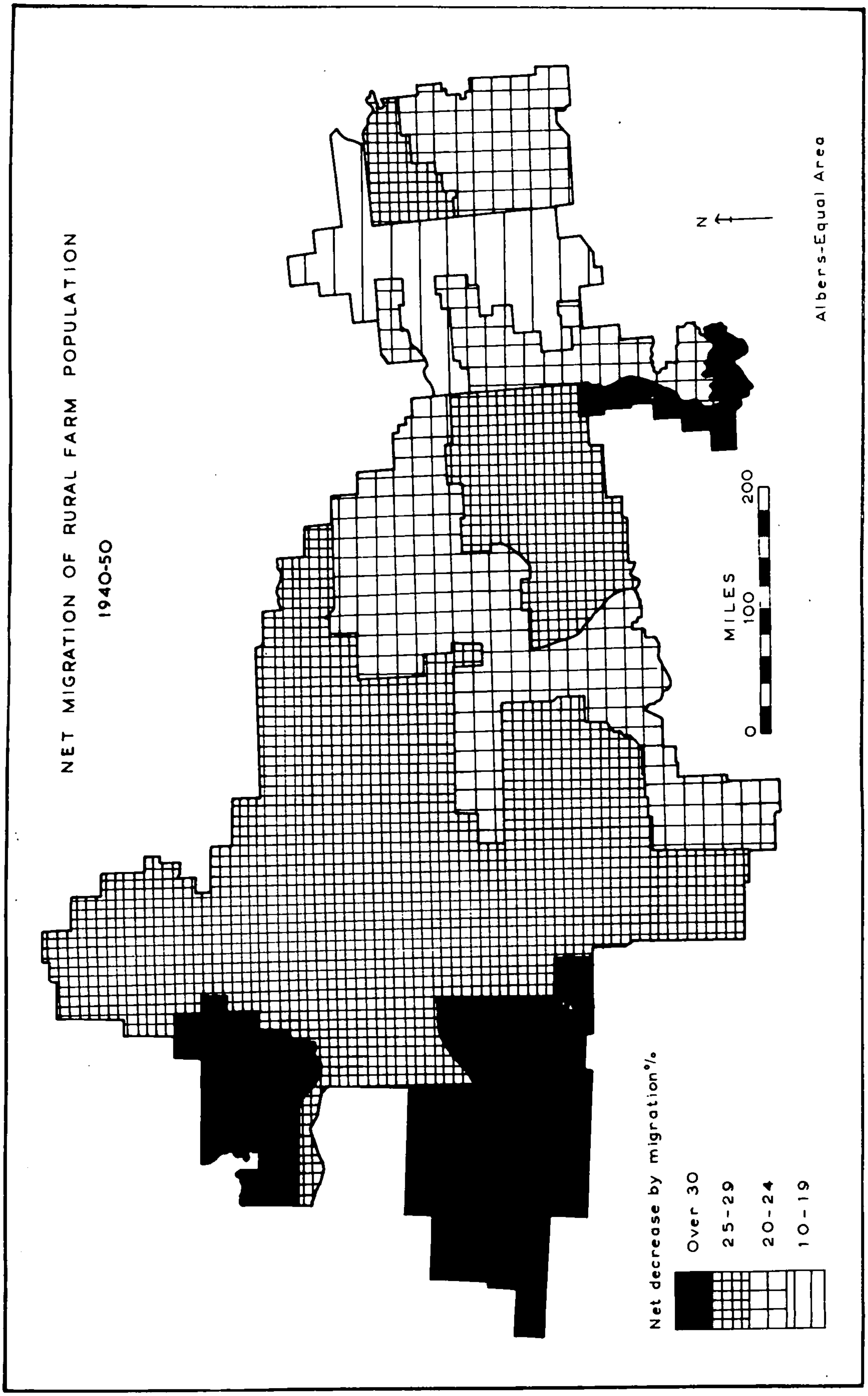
4. It is significant that the areas of highest increase by net migration of rural non-farm population in the central and eastern sections of the Corn Belt were precisely the same areas with the heaviest numerical loss of rural farm population by migration. This indicates that much of the increase in the rural non-farm population by migration may be attributed to change of residence by migration of the rural farm element.

It would be unsafe to generalise further on the limited statistical evidence, but the major contrast between a vast loss by migration of farm population and a significant increase by migration in the non-farm rural population is fundamental in the mechanism of rural-urban migration. Some further points may be made concerning the detail of the rural farm loss of population by migration.

Net Migration of Rural Farm Population, 1940 - 1950

Map 43 illustrates net migration of rural farm population during the decade 1940 - 1950 on the basis of Economic Subregions.

Map 43 indicates the crucial fact that everywhere in the Corn Belt there was a loss by migration of over -10% and that in all areas but parts of Indiana and Michigan the rate was -20%. In well over half the area of the Corn Belt



NET MIGRATION OF RURAL FARM POPULATION

1940-50

Net decrease by migration%
■ Over 30
▦ 25-29
▤ 20-24
▥ 10-19
MILES
0
100
200
N
Albers-Equal Area

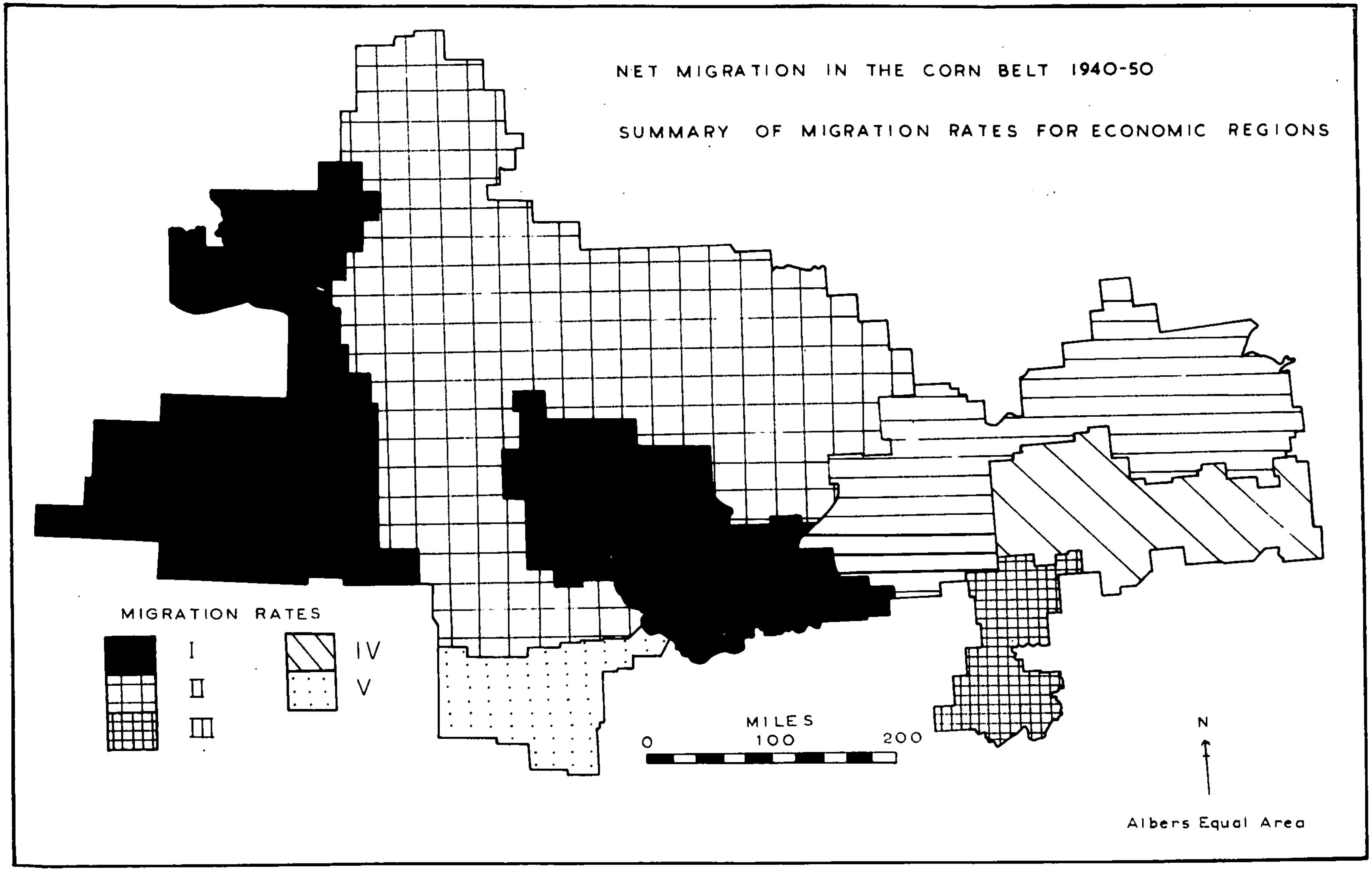
there was a loss of rural farm population by migration of over -25%.

The regions of heaviest loss, over -25%, show two general tendencies. There was a tendency for the areas of extensive farming, and low overall population density, on the margins of the Corn Belt to have lost population at the highest rate. Secondly there was a tendency for the areas of mechanised agriculture, but containing or adjacent to large urban centres, to have lost rural farm population by migration at high rates. This latter category included particularly the Cash Grain Area of the Illinois Prairie and the Till Plain of North West Ohio.

It is now necessary to form some interim conclusions in order to summarise our analysis of migration rates. This has been attempted in Map 44 which is based on Tables 61 and 63 above. In Map 44 the Economic Subregions of the Corn Belt have been grouped into similar change categories - that is, regions which experienced comparable changes in population as a result of net migration, both in their urban and rural populations. Since the various regions were contrasted in size and in the numerical value of migration, in order to form a grouping it was necessary to consider migration rates.

Map 44 indicates five change categories with

MAP 44.



NET MIGRATION IN THE CORN BELT 1940-50

SUMMARY OF MIGRATION RATES FOR ECONOMIC REGIONS

MIGRATION RATES
I
II
III
IV
V
MILES
0
100
200
N
Albers Equal Area

reference to population change by net migration. These change categories can be described by reference to consistent terminology as follows:-

1. A "high" rate of change due to net migration was considered to be 15% in the case of rural population and 5% in the case of urban population in view of the larger numerical values of urban agglomerations.

2. A "significant" rate of population change due to net migration was considered to be 8% in the case of rural population and 2% in the case of urban population.

3. Lower rates of change by net migration than those indicated in 2 above were considered to be "low" rates.

On the basis of this terminology, which has been consistently used in the drawing of Map 44 and in the following description the following classifications of changes in population due to net migration during the decade 1940 - 1950 was found to exist in the Corn Belt. This classification serves as the key to Map 44 opposite.

KEY TO MAP 44

Summary of Migration Rates of the Economic Subregions of the Corn Belt

Change categories of change of population due to migration, 1940 - 1950.

I. High rate of loss of rural farm population, significant rate of loss of rural non-farm population, high rate of increase in urban population.

II. High rate of loss in rural farm population, significant rate of increase in rural non-farm population and in urban population.

III. Low rate of increase in urban population, high rate of decrease in rural farm population, high rate of increase in the rural non-farm population giving a small overall increase in the total rural population.

IV. High rate of increase in the rural non-farm population, high rate of decrease in the rural farm population, but an overall high rate of increase in total rural population. Significant urban rate of increase.

V. Low rate of decrease in urban population, high rate of decrease in rural farm population, significant rate of decrease in rural non-farm population.

Analysing Map 44 it was found that in terms of characteristics of migration the Corn Belt was divided into two uneven areas east and west of the Illinois River Valley.

1. West of the Illinois Valley, that is the West Central

Lowland and the southern and western margins of the Corn Belt, there was an overall decrease in rural population. In two large areas shaded in black in the map, North Missouri - South Iowa and North Kansas - East Nebraska, this high rate of loss of rural population was from both the farm and non-farm sectors. Elsewhere the loss was from the farm sector, with significant rates of increase in the non-farm sector. In this region west of the Illinois Valley there was a high or significant rate of increase in urban population by net migration, obviously at the expense of the rural population, especially the rural farm sector. There was one exceptional area, South of Kansas City, extending across the Kansas-Missouri state boundary, which experienced loss by migration in both urban and rural sectors, and indicating an area of severe total loss of population by out migration.

2. East of the Illinois Valley, that is the East Central Lowland together with the adjoining Lower Great Lakes Region and the Lower Ohio Valley the pattern of migration was one of urban increase by migration at a significant rate, There was also significant ratesof increase in the total rural population, but this was exclusively due to high rates of increase in the non-farm sector and there were high rates of decrease in the rural farm population.

Two further topics remain to be discussed, they are the characteristics of rural depopulation, and secondly the extent to which migration was a vital factor affecting total population growth. Before these two important topics are discussed it is convenient to summarise the findings of this section so far.

Summary and Conclusions of the Characteristics of Net Migration

1. The Corn Belt population was shown to be highly mobile, this was shown by reference to gross population movement in the year 1949-50.

2. An index of mobility for the year 1949-50 offered evidence of a movement from rural to urban areas.

3. Rural areas of extensively mechanised agriculture and low population density were areas of high mobility.

4. The change in population in the Corn Belt due to net migration during the decade 1940 - 1950 showed a net loss of 335,794 persons. This indicated that in addition to the observed pattern of rural-urban migration within the Corn Belt, there was also regional migration to areas outside the Corn Belt.

5. There was considerable complexity in the detailed characteristics of net migration within the Corn Belt but

the most fundamental distinction lay between an eastern section experiencing net gain by migration and a southern and western section experiencing an overall loss in population by migration.

6. Very high rates of increase were experienced only in the case of urban population.

7. Rural population decrease by net migration was widespread and the rates were highest in areas of extensive farming, low population density and which contained few towns.

8. Towns act as a reservoir, keeping population within a region even though there might be rural depopulation within the same region, consequently the areas experiencing heaviest loss are those with few towns and a high proportion of rural population. Conversely the highest rates of increase in urban population occurred where they were few and far apart.

9. There were significant differences in rural migration between the farm and non-farm sections. In general the pattern was one of heavy rural farm loss and significant rural non-farm gain. The rural non-farm gain was at the expense of rural farm population. This loss of rural farm population by migration has spread to most of the Corn Belt and the rates have increased in the past two decades. This loss was not restricted to the areas of extensive farming but also occurred in areas of intensive agriculture, for instance

the Cash Grain farming of the Illinois Prairie.

It has been suggested that the most notable feature of net migration in the Corn Belt in the decade preceding the last census was the movement of farm population from rural areas into the urban and non-farm sectors, or out of the Corn Belt altogether. It is necessary therefore to consider the rural farm migration in more detail, in particular with reference to the age and sex composition of the migrants, in order to throw some light on causative factors involved.

4. INTERNAL NET MIGRATION OF RURAL FARM POPULATION, 1940-1950; AGE AND SEX CHARACTERISTICS

The data for the characteristics of migrants by age and sex composition can be calculated by the Survival Ratios Method. This has been computed and published for rural farm population by the U.S. Department of Agriculture.[115]

For the entire Corn Belt the net loss of population by migration from the rural farm sector during the decade 1940 - 1950 was 1,014,000 at a rate of 25.4%.[116]

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115. U.S. Department of Agriculture, "Farm Population", Op. Cit. 104.

116. *Op. Cit.* 104, Page 63, Table 6-5

TABLE 64

LOSS OF RURAL FARM POPULATION IN THE CORN BELT DUE TO NET MIGRATION, 1940-1950

Characteristics by age and sex groups, figures in thousands, all negative rates

AGE GROUPS	Total Loss by Migration			Rate of Loss by Migration		
	Both Sexes	Male	Female	Both Sexes	Male	Female
0 - 4	42	18	23	10.7	9.1	12.3
5 - 9	83	29	54	21.9	15.2	28.8
10 - 14	191	88	104	46.1	41.6	50.7
15 - 19	198	111	87	45.5	47.9	42.7
20 - 24	100	71	28	28.6	36.3	18.7
25 - 29	44	30	13	14.5	18.5	9.7
30 - 34	28	16	12	10.4	11.1	9.5
35 - 39	29	13	16	11.1	9.7	12.6
40 - 44	39	15	23	14.7	11.5	18.0
45 - 49	46	18	28	18.4	13.7	23.4
50 - 54	54	21	33	24.4	18.4	30.8
55 - 59	63	26	37	33.2	26.3	40.5
60 - 64	48	22	26	36.4	31.1	42.5
Over 65	51	26	24	35.2	33.9	36.8
ALL AGES	1,014	505	509	25.4	24.1	26.8

Source: "Farm Population", Net Migration from the Rural Farm Population, 1940-50 U.S. Department of Agriculture, Agricultural Marketing Service, Statistical Bulletin No.176, June 1956, Table 6-5.

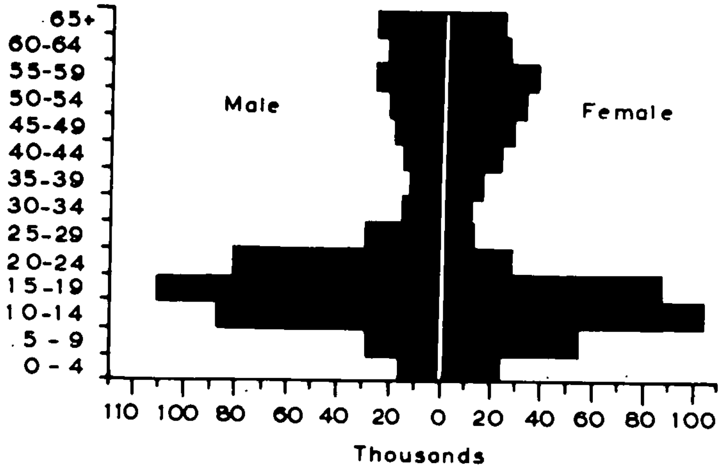
The detailed characteristics by age and sex composition are shown in Table 64, illustrated by Diagram 28. Diagram 28(1) indicates total loss by migration by five year age groups in the conventional pyramid fashion, while diagram 28(2) indicates the rate of loss by the same age groups. Diagram 28(1) indicates that the heaviest numerical loss of rural farm population was in the age groups 10-30 years. There was, however, some sex differentiation. More females than males migrated in the age groups 10-14 years but the highest figure of all is for males between the ages 15 and 19 years. The figures decreased rapidly in the age group 30 - 50 years and within this group male migrants were noticeably fewer than females. Above the age of 50 years the loss by migration increased again though never approaching the values of the 10 - 25 group.

These observations correspond with a well-known demographic pattern. The age groups 0 - 5 and 25 - 50 years are usually the most stable age group since this normally constitutes the family. Within the group 25 - 35 years, the type of employment of the head of the family is usually determined and a young family in existence; both of which circumstances may act as a considerable tie as far as residence is concerned. The most mobile age groups were those of youth, 15-25 years, and older age, over 60 years. The former often moving from rural areas in order to seek

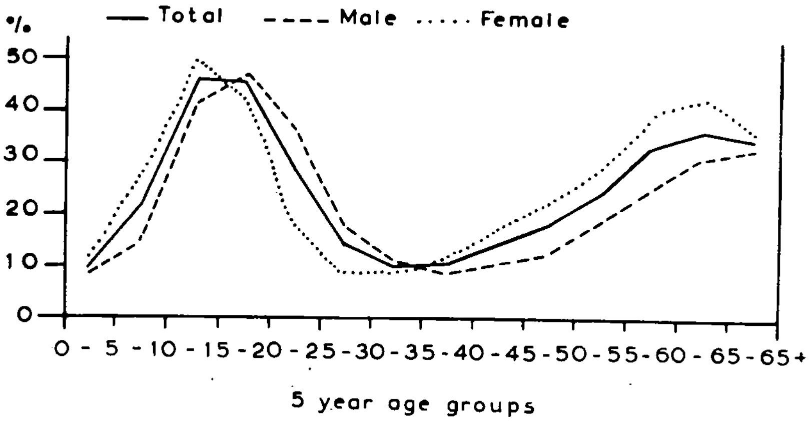
DIAG. 28.

NET MIGRATION OF RURAL FARM POPULATION 1940-50.

1. LOSS BY NET MIGRATION BY AGE GROUPS.



2. RATE OF LOSS BY NET MIGRATION.



their first employment, and the latter frequently moving on retirement. The vast loss in the age group 10 - 14 years observed in Diagram 28 is related to the statistical derivation of the diagram; within the decade they will be of the age 20 - 24 years.

Diagram 28(2) indicates the rate of loss by migration. The same pattern by age groups was apparent except that the rate of loss by migration in the older age groups is shown to be as high as that in the youth age groups. This higher rate was almost certainly related to the effect of mortality in the higher age groups which reduced their total numbers and therefore increased the rate of migration within the age group.

Map 45 shows the regional variation from the general Corn Belt pattern described above. Loss by migration has been plotted for each five year age group on the basis of Economic Subregions.[117] The regional variation is evident from the map but three basic patterns can be distinguished, as indicated on the map.

1. Indiana, Ohio, Michigan and Kentucky, West Missouri-East Kansas

This pattern of rural farm loss by age groups was related to the proximity of the urban centres of the eastern sector of the Corn Belt, and in the case of West Missouri, Kansas City. The high rate of loss by migration in the age

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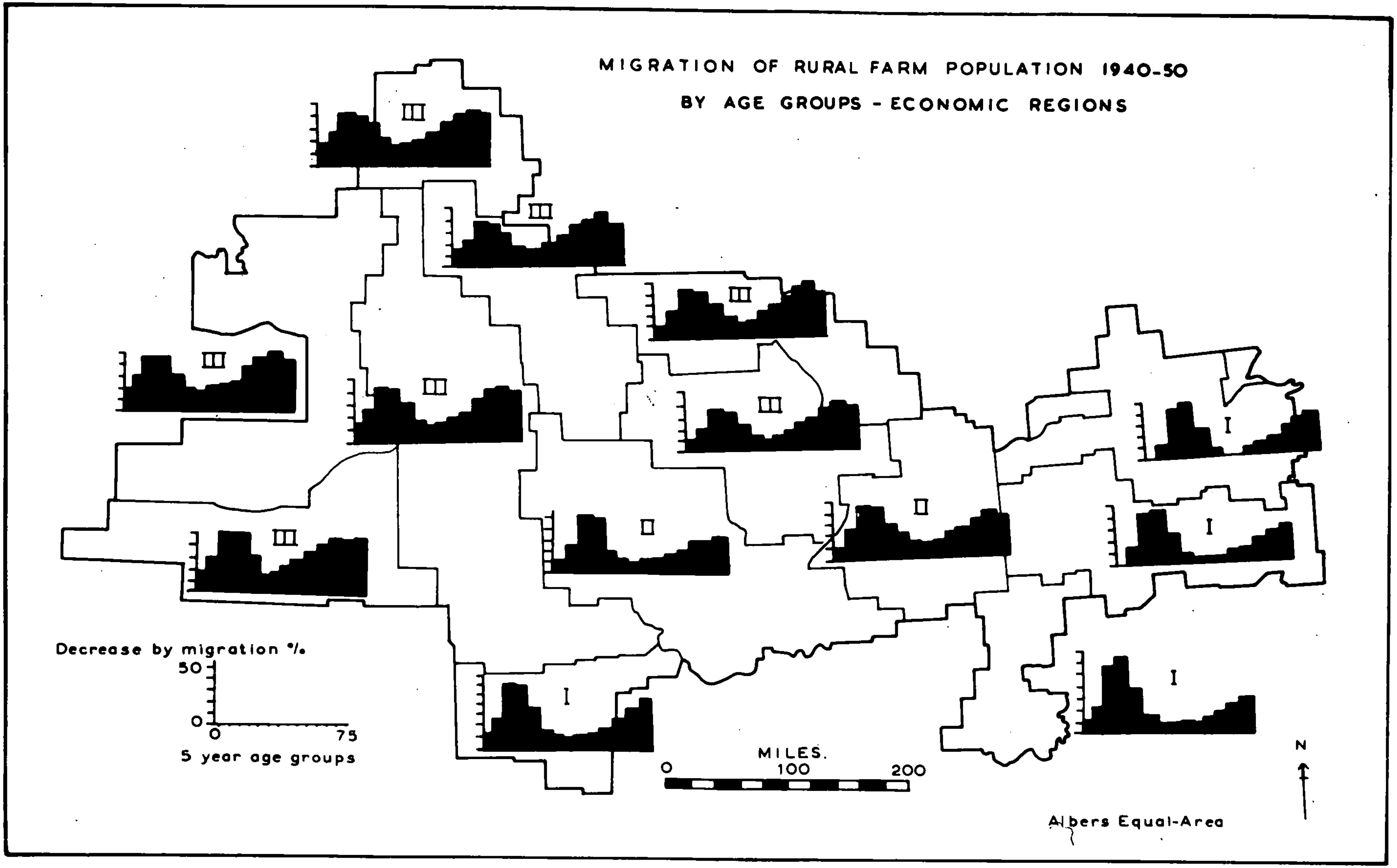
[117] Source of Map 45 Vide, Op. Cit, P.68, Table 7

MAP 45.



MIGRATION OF RURAL FARM POPULATION 1940-50
BY AGE GROUPS - ECONOMIC REGIONS

III
III
III
III
III
III
III
II
II
I
I
I
I
Decrease by migration %
50
0
0
75
5 year age groups
MILES.
0
100
200
N
Albers Equal-Area

group 10 - 25 was readily explained by the drift from rural to urban areas of young people for purposes of employment and education. This high rate was followed by a very marked drop in the age group 25 - 50. It must be assumed that the bulk of the agricultural working population together with their families fell in this group andconstituted a more stable population. Finally, from the age 55 upwards there was a gradual increase in the rate of loss by migration, though never reaching the high rates of the 10 - 25 years group.

2. Central Corn Belt

In Illinois and North Missouri, in the heart of the Corn Belt, was a transitionary area. It was similar to the pattern described in 1 above, and there are many towns in this section of the Corn Belt. However there was less decrease in the migration rate in the middle age groups; that is, there was a more continuous drift from the land in all age groups.

3. Western Corn Belt

This afforded the strongest contrast to the eastern sectors of the Corn Belt. The initial high rates of loss by migration started at an earlier age and lasted longer, involving the family group. In many instances the decrease in migration in the middle years was only slight implying

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a continuous and heavy loss of population at all ages, even the older age groups.

It is obvious that in any discussion of migration by age groups it is necessary to distinguish three main groups; (a) Young Adults; (b) Children and Adults; and (c) Elderly and retired. Each of these groups, which is effectively separate from the point of view of function and status tends to have a contrasted pattern of migration. This has been summarised diagrammatically in Diagram 29, which is a dispersion diagram based on the Economic Sub-regions of the Corn Belt. The graph indicates the trend in the mean value. From Diagram 29 it can be indicated that:-

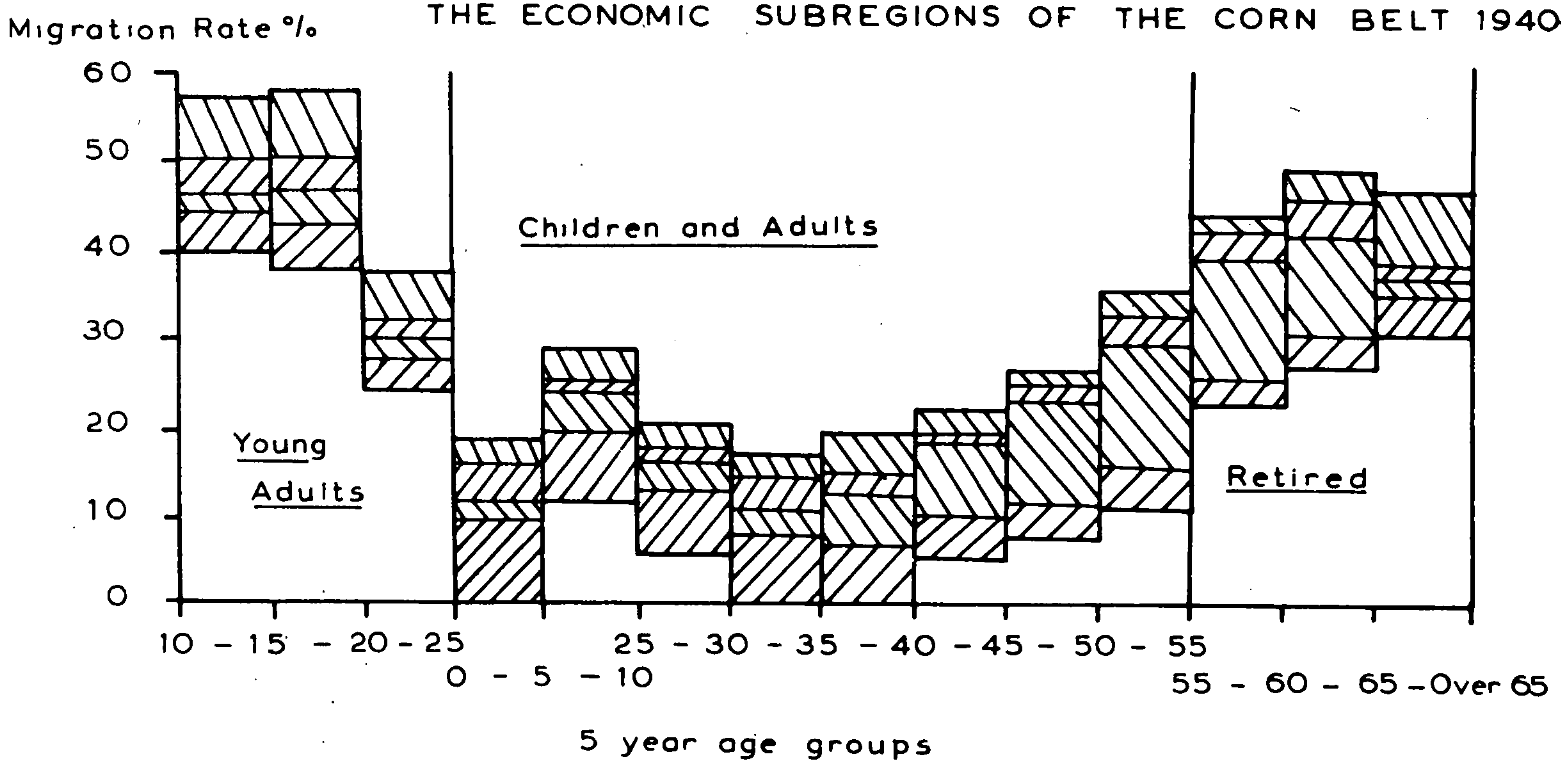
1. The high rate, mean over 40%, of young adult migration is in response to:
    - (a) the better employment opportunities away from the rural areas and especially in urban centres
    - (b) in part it was related to movement to places of higher education
    - (c) it was facilitated by a lack of such restrictions as established employment or family responsibilities

2. The lower migration rate of thefamily group (young children and adults) was related to the restrictions imposed by established employment and family ties. Many of this group would in fact be farm owners or tenants.

DIAG. 29.

VARIATION IN NET MIGRATION BY AGE GROUPS – RURAL FARM

DISPERSION DIAGRAM OF MIGRATION RATES FOR
THE ECONOMIC SUBREGIONS OF THE CORN BELT 1940-50.



3. The higher rate of migration in the elderly age groups coincided with the pattern of retirement, either to another region altogether, or to a nearby town, frequently when a son takes over the farm, or when tenancy is relinquished on retirement.

Two further topics require discussion in this section. Firstly there must be some assessment of the extent to which migration acts as a demographic factor influencing population change. Secondly, some summary of causative factors involved in population movement must be indicated.

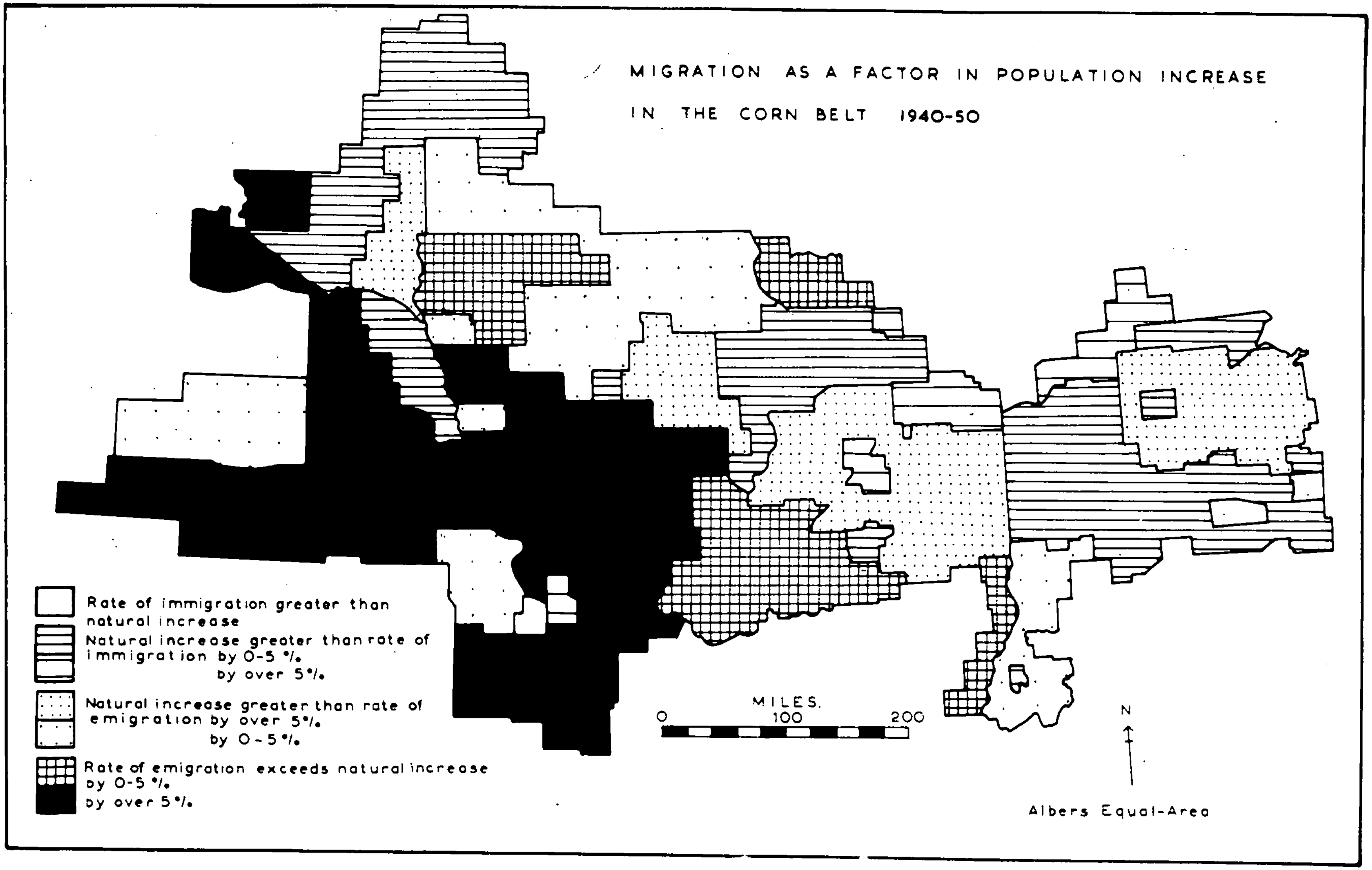
4. NET INTERNAL MIGRATION AS A DEMOGRAPHIC FACTOR

The demographic significance of net migration can be measured by a comparison of rates of migration and rates of natural increase, since both are ratios on the same base, the 1940 population. This comparison has been summarised cartographically in Map 46, for the State Economic Areas of the Corn Belt. The map indicates that there are four demographic possibilities.

1. The rate of increase by net migration may be greater than the increase in population due to natural increase.

2. The rate of natural increase may be greater than the increase due to net migration.

MAP 46.



MIGRATION AS A FACTOR IN POPULATION INCREASE IN THE CORN BELT 1940-50

Rate of immigration greater than natural increase
Natural increase greater than rate of immigration by 0-5 %.
by over 5%.
Natural increase greater than rate of emigration by over 5%.
by 0-5%.
Rate of emigration exceeds natural increase
by 0-5 %.
by over 5%.
MILES.
0
100
200
N
Albers Equal-Area

3. The rate of natural increase might be greater than the rate of loss by net migration.

4. The rate of loss by net migration might be greater than the rate of growth by natural increase.

In 1, 2 and 3 there would be continuous population growth although in 3 there would be a partial loss by migration, while in the case of 4 there would be absolute depopulation. These four categories have been plotted for the Corn Belt and further subdivision made by the mathematical values of the rates within these four categories.

From Map 46 it is convenient to describe first the areas of absolute depopulation. It is seen from the map that depopulation during the decade 1940 - 50 due to net migration had a very extensive distribution in the western and south central areas of the Corn Belt. A comparison with Map 43 indicates that this was the area of heaviest loss of rural population by migration. It is apparent that over large areas of the Corn Belt rural depopulation was in progress during the decade 1940 -1950. Moreover in many areas this loss by migration exceeded the replacement by natural increase by over 5%.

Secondly, considering the other extreme, the areas where population increase was greater by net migration than by natural increase may be indicated. These areas were in fact very restricted, and included only those counties containing the three cities of Kansas City, Dayton and Columbus, Ohio.

Thirdly the distribution of areas which experienced population increase by both natural increase and net migration but where natural increase was the more significant rate is seen to have had a much wider distribution. This was characteristic of the eastern urbanised sector of the Corn Belt in particular and of isolated counties containing large cities in the west of the Belt, especially Des Moines and Omaha.

Finally, the case where there was loss by net migration but where this was offset by natural increase is shown. Here a further distinction must be made. The areas where the excess of natural increase over net migration rate was less than 5%. were located close to areas of depopulation, and it may be suggested that these western, predominantly rural areas are also potential areas of loss of population by migration. On the other hand the areas where the gain by natural increase was at a rate exceeding by 5% the rate of loss by migration were located in the eastern half of the Corn Belt where the presence of large towns acted as attractions to migrants and reduced the overall loss by migration.

5. CAUSATIVE FACTORS INVOLVED IN INTERNAL MIGRATION IN THE CORN BELT, 1940 - 1950

It was shown at the beginning of the present chapter that statistical information on the volume and direction of internal migration was very restricted and such information had to be derived or inferred. This applies even more forcibly in the case of the motives involved in internal migration. This absence of statistical information on causative factors raises methodological difficulties and the problem is complicated by several considerations. Firstly there are many types of migration each with different social and economic backgrounds and contrasted incentives. Secondly there are frequently several interrelated causative factors involved and it may be impossible to isolate particular ones or evaluate the differential significance of each. Thirdly, the method of considering decennial censuses as time bases poses the intractable problem of assessing particular causative factors in their appropriate time context. Unemployment, for instance, experiences seasonal and annual variations as well as regional contrasts as a factor influencing migration patterns. It is necessary therefore to review the major methodological possibilities and to suggest the most appropriate to the present study.

Inference by Comparative Studies

One of the most straightforward methods is that of statistical and cartographic comparison of the spatial distribution of migration and other selected social phenomena which may be assumed significant, such as increases in agricultural mechanisation, distribution of unemployment and increase in farm size and examining the degree of correlation by the degree of spatial coincidence. This appears a crude method but some accuracy of interpretation is possible if the background is well known and appropriate selectivity is employed. This method has been used by Jehlik and Wakeley[118] in the North Central States and is applicable especially to agricultural societies and rural economies where the pattern of migration is frequently most uniform and straightforward, It may be used in this context in the present study.

Statistical Correlation Methods

A more sophisticated process is to assess the degree of relationship between migration and selected causative factors on a purely statistical basis. The usual technique is correlation by regression line where migration rates for selected areas are plotted against specific causative factors and the degree of functional relationship inferred from the degree of graphical correlation. This method has two severe limitations. Firstly, statistical correlation does

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118. Jehlik, D.J. and Wakeley, R.E. Op. Cit. 109

not necessarily imply a functional relationship since the correlation may be completely or partially coincidental or the relationship may be complimentary rather than causative. Secondly, it is unlikely that migration is caused by a single isolated factor but rather by a complex of inter-related circumstances. In this latter case a single regression line gives no indication of the relative significance of a selected factor in a more complex causation. Where a number of variables are obviously involved as causative factors the technique of multiple regression and co-variance analysis has been employed.[119] Techniques of multiple regression have been evolved by which it is possible to isolate the several variables and assess the statistical significance of each. The resultant expression of this method is a series of unweidly indices which tend to become remote from the real situation.

Techniques of statistical correlation therefore have severe limitations in the case of the Corn Belt in view of the vast population, the large areal extent and the diversity of economic and social conditions. The only satisfactory method is that based on fieldwork but again in the case of an area so immense as the Corn Belt this

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119. Vide Bogue, D.J. and Harris, D.L. "Comparative Population and Urban Research via Multiple Regression and Co-variance Analysis", Scripps Foundation Studies in Population Distribution No.8. Miami University, Oxford, Ohio 1954, for a study of the methodological aspects of this statistical technique.

too poses practical difficulties. It is obvious however that sample studies of particular types of migration could shed much light on the pattern as a whole.[120]

In view of the difficulties which have been outlined it is considered that only major causative factors can be considered within the present scope and that only tentative conclusions may be formed. The method followed is chiefly that of the comparison of migration rates and the distribution of selected phenomena which must be treated in a very general sense since it would be fallacious to empiricise on insufficient and inadequent census data.

It has been shown repeatedly that the predominant pattern of migration between 1940 and 1950 was the exodus of rural population to urban residence and that this pattern had as its causal base certain expulsive factors related to the rural economy together with certain complementary attractive factors implicit in urban residence and employment. It may be suggested that this pattern was brought about by a complex of factors in which the major elements were an increase in the size of farm brought about by an increase in mechanisation effecting a reduction in the number of farm holders and an overall reduction in the agricultural labour force together with the strong economic

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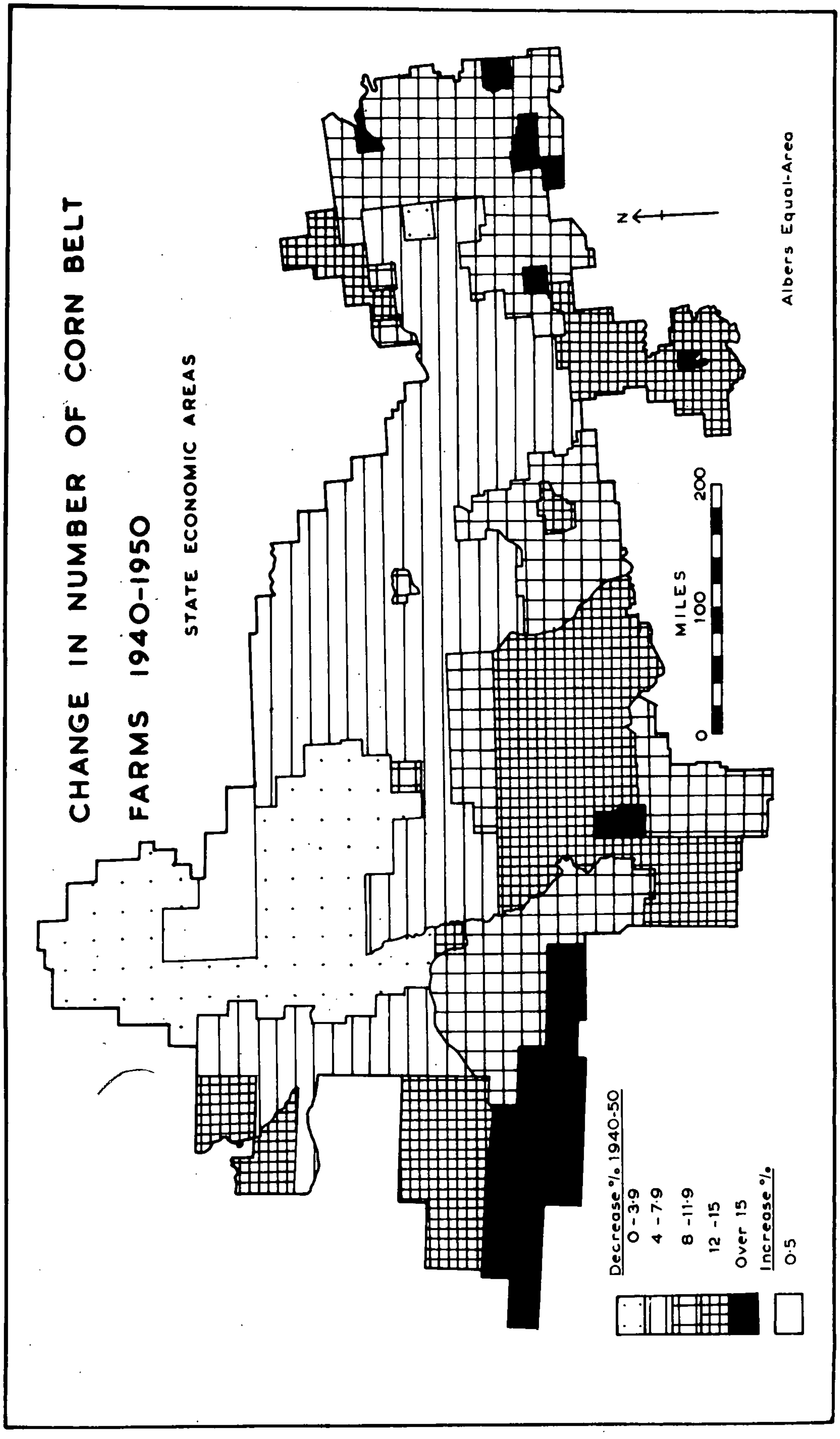
120. Vide for instance Luebke, B.H. and Hart, J.F. "Migration from a Southern Appalachian Community", Land Economics, XXXIV, No.1. Feb, 1958.

and social attractions of urban life based on more remmunerative employment and more varied amenities. This pattern did not account for all the internal migration, as we have indicated that the migration pattern of negro population for instance was rather specialised, but it was the dominant trend and as such requires further expansion.

As a starting point it is necessary to consider certain changes in the rural economy which proceeded during the decade 1940 - 1950, which acted as expulsive factors. Chief of these was the decrease in the number of farms and farm holders. Map 47 indicates the change in the number of farms in the Corn Belt during the decade on a percentage basis. It is seen that there was an almost universal decrease in the number of farms and that this decrease was highest, over 8%, in the southern and western sections of the Corn Belt where rural loss of population was shown earlier in the chapter to be most severe. The high decrease in the number of farms coinciding with the State Economic Areas containing large cities reflected the changeover of farm land to non-agricultural functions in the rural-urban fringe. Moreover Map 48, illustrating the average size of farm holding in the Corn Belt shows that the highest decreases in the number of farms took place in the western and southern areas of the Corn Belt where the farm size was already large suggesting that this increase in size in areas of heavy loss of rural

MAP 47.

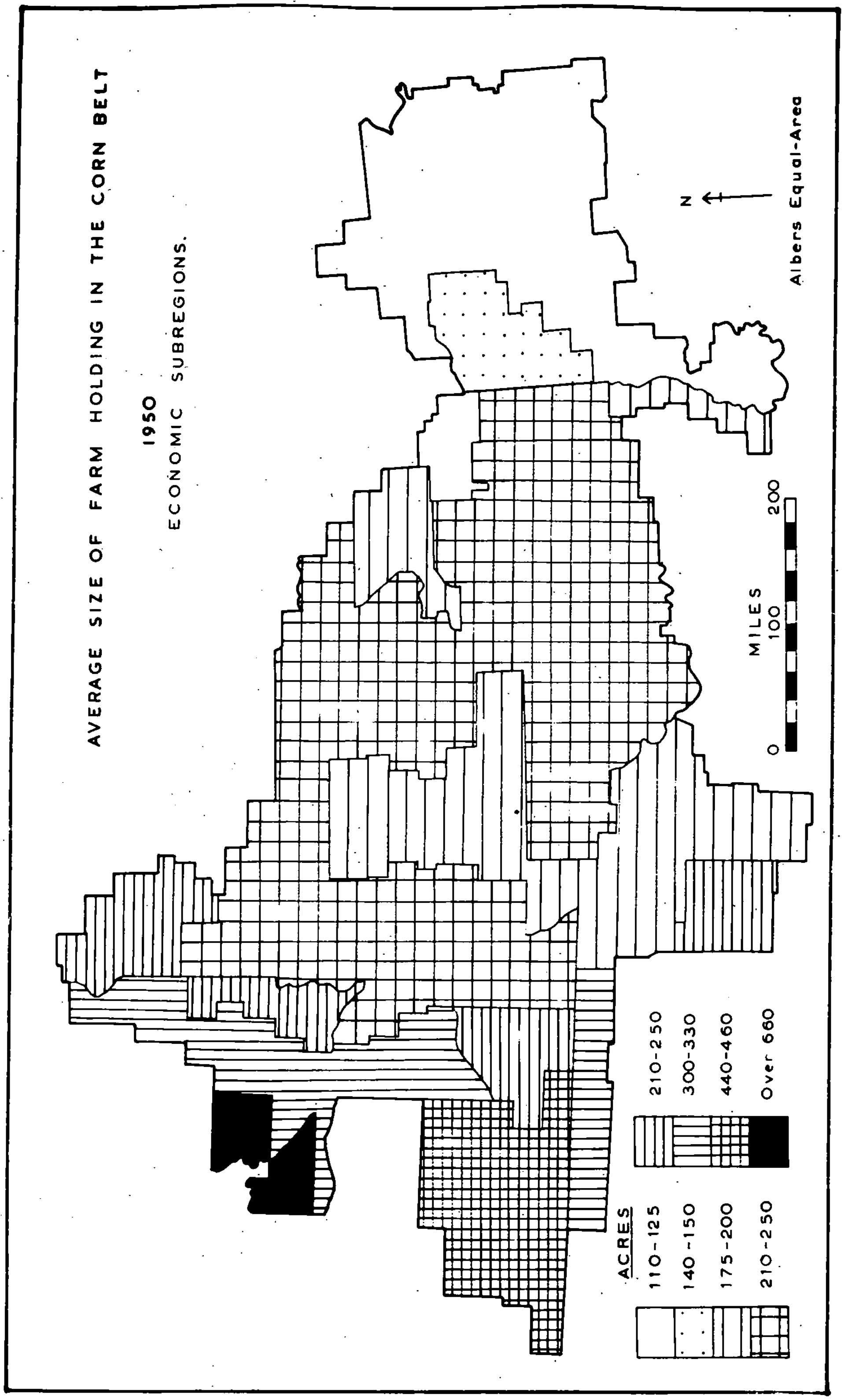


CHANGE IN NUMBER OF CORN BELT FARMS 1940-1950

STATE ECONOMIC AREAS

Decrease % 1940-50
0-3·9
4-7·9
8-11·9
12-15
Over 15
Increase %
0·5
MILES
0
100
200
N
Albers Equal-Area

MAP 48.



AVERAGE SIZE OF FARM HOLDING IN THE CORN BELT

1950

ECONOMIC SUBREGIONS.

ACRES
110-125
140-150
175-200
210-250
210-250
300-330
440-460
Over 660
MILES
0
100
200
N
Albers Equal-Area

population was related to increased mechanisation. Some idea of the actual numbers involved in the decrease in farms may be gained from Table 65 below.

TABLE 65

THE CHANGE IN THE NUMBERS OF FARMS IN FOUR SELECTED CORN BELT STATES, 1920 - 1950

STATE	1920	1930	1940	1950
Nebraska	124,417	129,458	121,062	107,174
Iowa	213,439	214,928	213,318	203,155
Illinois	237,181	214,497	213,439	195,212
Indiana	205,126	181,570	184,549	166,638

Source: U.S. Bureau of the Census, Census of Agriculture 1954, Table 1.

Table 65 shows that in each of the selected states there was a decrease in the number of farms by over 10,000 and in the cases of Nebraska, Illinois and Indiana by approximately 20,000 during the decade 1940 - 1950. This decrease in the number of farms and farmholders is known to have been a significant factor in the drift from the land of rural farm population the magnitude of which is reflected in the trend of the total rural farm population as shown in Table 66.

TABLE 66

THE CHANGE IN THE RURAL FARM POPULATION OF FOUR SELECTED CORN BELT STATES, 1930 - 1950

STATE	Rural Farm Population			Rural Farm as % of Total Population		
	1930	1940	1950	1930	1940	1950
Nebraska	582,981	495,447	391,481	42.3	37.7	29.5
Iowa	964,659	916,768	782,821	29.0	36.1	29.9
Illinois	991,461	968,103	765,277	13.0	12.3	8.8
Indiana	808,981	812,651	668,064	25.0	23.7	17.0

Source: Calculated from U.S. Bureau of the Census, Census of POpulation, 1950, Volume ii. Characteristics of the Population, Table 13.

Table 66 indicates that since 1930 the rural farm population in each of the states has decreased by approximately 200,000 while the proportion of the rural farm in the total population fell by up to 10%.

This decrease in the rural farm population was related to the decrease in the number of farms and the increase in farm size which in turn was effected by increased mechanisation of agricultural operations. This increase in the use of agricultural machinery was a feature of the years following the Depression and especially gained impetus during the war years. The expansion of mechanisation in agriculture during the war was in part due to the emphasis on increased food production but to some extent was made necessary by the migration of rural population to urban centres during the expansion of the war industries and to the loss of agricultural labourers to the armed services. The increase in mechanisation may be measured by two indices. Table 67 below indicates the increase during the decade 1940 - 1950 in the number of farms using tractors, and also the increase in the total number of tractors in selected states.

TABLE 67

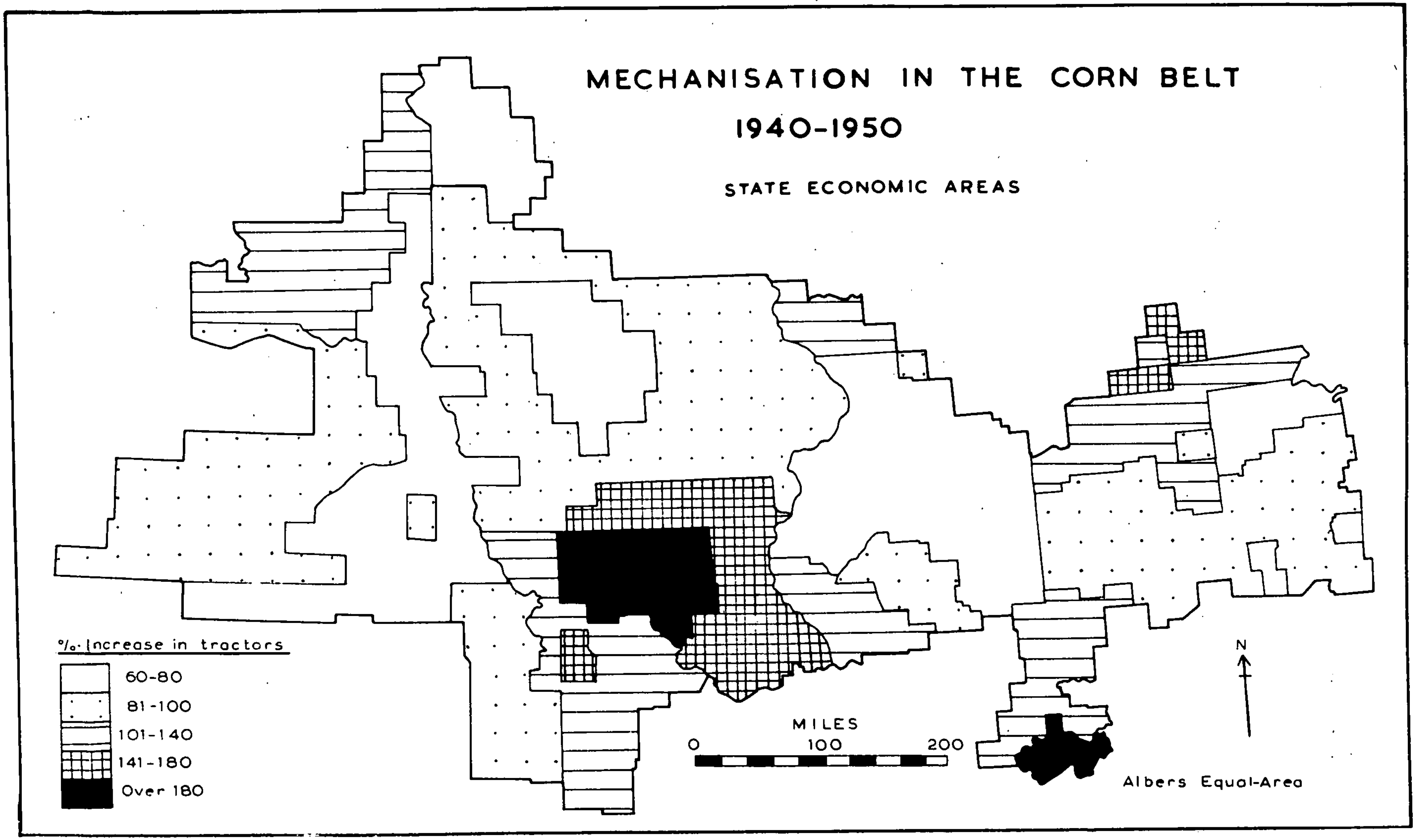
INCREASE IN THE NUMBER OF FARMS USING TRACTORS AND THE INCREASE IN THE TOTAL NUMBER OF TRACTORS IN FOUR SELECTED CORN BELT STATES, 1940 - 1950

STATE	Number of Farms using Tractors		Total Number of Tractors	
	1940	1950	1940	1950
Nebraska	64,593	87,576	70,761	127,154
Iowa	117,932	161,305	128,516	240,941
Illinois	110,489	141,988	126,069	234,789
Indiana	68,447	106,037	73,221	153,980

Source: U.S. Bureau of the Census, Census of Agriculture 1954, Table 6.

From Table 67 it is seen that in the decade the number of farms using tractors increased by 25% in the selected states while the total number of tractors almost doubled in each state. Map 49 illustrates the same index of mechanisation in greater detail and shows that throughout the Corn Belt the increase in the number of tractors increased by over 50% and in extensive areas the increase was by over 100%. It is apparent that the highest increase in mechanisation occurred particularly in the

MAP 49.



MECHANISATION IN THE CORN BELT
1940-1950
STATE ECONOMIC AREAS

%. Increase in tractors
60-80
81-100
101-140
141-180
Over 180
MILES
0
100
200
N
Albers Equal-Area

large farms of the Western and Southern Corn Belt and also on the much smaller farms in the east while the more productive intermediate sized farms of the Grand and Iowan Prairie, already highly mechanised by 1940, experienced a much smaller increase. It is also apparent that the greatest increase in mechanisation coincided with areas of heavy decrease by migration of rural farm population in Northern Missouri, Southern Indiana and South Dakota.

The extent to which increase in farm size, decrease in the number of farm holdings and the increase in mechanisation of agricultural labour affected the characteristics of the agricultural labour force is suggested in Tables 68 and 69 below.

TABLE 68

CHANGE IN THE NUMBER OF HIRED WORKERS IN AGRICULTURE, 1940-1950(1)

STATE	Hired Workers		Total family and hired workers	
	1940	1950	1940	1950
Nebraska	20,431	16,636	179,262	183,692
Iowa	55,851	40,130	342,144	336,324
Illinois	62,405	49,855	322,512	299,979
Indiana	35,217	27,438	256,141	240,495

Source: U.S. Bureau of the Census, Census of Agriculture 1954, Table 5.

(1) Taken in March of the Census years.

TABLE 69

CHANGE IN THE TOTAL AGRICULTURAL LABOUR FORCE 1940 - 1950 (1)

STATE	Total Agricultural Labour Force		% of total labour force	
	1940	1950	1940	1950
Nebraska	162,144	151,438	37.6	29.6
Iowa	309,735	286,267	35.9	28.5
Illinois	285,136	251,123	10.0	7.1
Indiana	205,610	175,645	17.9	11.6

Source: U.S. Bureau of the Census, Census of Population, 1950 Vol.ii. Characteristics of the Population, Table 31.

(1) Total persons engaged full time in agriculture.

Table 68 indicates that the number of hired workers employed in agriculture fell during the decade by from 4,000 to 15,000 in each state. However, traditionally much of the farm holder's seasonal labour is provided by his own family. Accordingly the second column shows the total casual labour force including family labour. Again in all states but Nebraska there were significant declines. Secondly Table 69 shows that the actual agricultural labour force, that is persons fully employed in agriculture declined by from 10,000 to 20,000 in each state, and there were significant reductions in the proportional size of the agricultural labour force.

There was then in the decade, a correlation between increased mechanisation and increase in farm size and decrease in farm holders and decrease in the agricultural labour force, which coincided spatially with areas of the Corn Belt which experienced loss of rural farm population. This decrease in the employment opportunities in rural areas is suggested as one of the chief expulsive factors encouraging rural-urban migration.

In addition to the expulsive factors outlined above a second series of factors operate as attractions, drawing rural population towards the towns and these factors attract both the farm and non-farm elements. Chief of these factors is the economic attraction of the more remunerative employment prospects in industry in urban centres and coupled with this is the possibility of a wider variety of amenities that are offered by urban life that are particularly attractive to the more mobile younger age groups seeking first employment. The thesis that migration is related to economic betterment is not straightforward however, and in the Corn Belt the highest migration was not entirely from the areas of lowest living standards.

The attraction of labour force from agriculture into industry can be inferred from a comparison of the trend in the two labour groups. We have seen that in agriculture the trend by a number of indices was downwards. Table 70 below indicates that in the selected states the trend in the industrial labour force was markedly upwards.

TABLE 70

CHANGE IN THE MANUFACTURING INDUSTRY LABOUR FORCE, 1940 - 1950 SELECTED CORN BELT STATES

STATE	Labour Force in manufacturing industry		% of total labour force	
	1940	1950	1940	1950
Nebraska	29,365	46,915	6.9	9.2
Iowa	98,562	151,984	11.4	15.2
Illinois	821,109	1,135,955	28.7	32.0
Indiana	345,345	527,836	30.1	34.8

Source: U.S. Bureau of the Census, Census of Population, 1950 Vol.ii. Characteristics of the Population, Table 13.

Only a general and tentative account has been outlined of the mechanism of the dominant form of internal migration in the Corn Belt, the drift from rural to urban residence. This was a more complex pattern than has been indicated and a great variety of additional causative factors were involved, the significance of which it is impossible to measure.

It is well known that the state of the economy is a direct influence on the scale of internal migration, and in this respect conditions were favourable during the decade 1940 - 1950 as industrial production was expanding to meet the requirements of the war effort at a time when agricultural mechanisation was increasing. Moreover, during the previous decade there had been little movement from farms since during the Depression employment opportunities in industry were restricted.[121 and 122] It seems likely therefore that this potential migration was released in the decade 1940 - 1950 since we have indicated a high rate of rural out-migration in the middle age groups which normally experience a relatively low rate.

The transfer of many rural functions, as for instance the collection of dairy products and meat, to centralised urban establishments has contributed to the elimination of many of the rural service occupations normally employing rural non-farm labour. On a larger scale government agricultural policy had a direct bearing on migration by the influence on such matters as farm ownership and expansion, the subsidisation of the soil bank, and during the war, mechanisation, all of which have influenced labour needs by producing more and more from fewer and fewer labourers. There was a trend, since the increase in mechanisation, for farmers to do off-farm work which familiarised farm workers with other kinds of employment and may have encouraged especially the tenant farmer to leave the land and take urban employment.

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121. For a discussion of this situation Vide Baker, O.E. "Some Agricultural Implications of the Population Prospects of the United States". Congrès International de la Populatio Paris, 1937, Vol. IV, 1938.

122. A more general discussion of the relation between migration and variations in economic conditions is in Thomas, B. "Migration and the Business Cycle". London, 1958.

In addition to the straightforward incentive of economic betterment a large variety of social factors may be highly significant but which are impossible to evaluate. This includes such factors as health, climate, and educational and housing problems.[123]

The problem of describing and analysing internal migration was found to be so complicated that in the writing of this chapter it was found necessary to provide frequent summaries. It is therefore unnecessary to recapitulate at this point in detail. The significance of internal migration in the Corn Belt during 1940 - 1950 should not be underestimated since both the cause and effect had far reaching implications economically, socially and demographically, to which further reference will be made. An influence in the pattern of internal migration is frequently that of the physical environment which may determine accessibility and ease of movement. It was shown that in the pioneer settlement of the Corn Belt this principle certainly applied. Today the Corn Belt is a vast area with no significant physical barrier to movement,an area of unrestricted ease of access so that in response to changing economic and social circumstances the process of redistribution of population by

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123. The significance of these varied factors in examined in "Post-War Migration in the United States and its Causes", U.S. Bureau of the Census, 1945-46, Washington DC.

internal migration proceeded without impediment.

In this chapter migration has been studied as a social and demographic phenomenon particularly in the latest decade. The influence of migration in population growth during previous decades was deferred until a general consideration of 20th Century growth of population in the Corn Belt was attempted. This now follows in Chapter Nine.

CHAPTER NINE

THE GROWTH OF POPULATION 1900 - 1950

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THE GROWTH OF POPULATION 1900 - 1950

It has been shown in an earlier chapter[124] that the Corn Belt as defined in 1950 had been pioneered by 1860 and by 1900 had evolved the essential characteristics of the basic settlement pattern. The rapid growth from 1860 to 1900 was the product of a high, though declining, birth rate together with a large volume of both internal and foreign immigration. The period also witnessed a great increase in the number and size of towns but by 1900 the population of the Corn Belt was still overwhelmingly rural in residence. The events of the half century from 1900 - 1950 brought about considerable modification involving much redistribution of population and changes in the residential composition. It is the purpose of the present chapter to describe the nature of these changes, to outline the causative economic and demographic factors involved and to describe the extent to which recent redistribution of population is a factor in the present contrasts in the population geography of the Corn Belt.

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[124] Vide Chapter Three, "The Peopling of the Corn Belt, 1790 - 1900"

The literature on population growth since 1900 is immense but suffers from a concentration on national rather than regional treatment. Consequently much published information is generalised and conceals the relationship between population change and socio-economic factors. On a national scale the works of Thompson[125] and Landis and Hatt[126] are particularly useful, while Bogue[127] in a recent publication has attempted a regional approach. A very valuable appreciation of the demographic implications of the changing economic characteristics of the United States after 1900 was published by the National Resources Planning Board[128] while the characteristics of population changes in recent decades have been studied by the staff of the Scripps Foundation for Research in Population Distribution at Miami University, Oxford, Ohio[129]

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[125] Thompson, W.S. "Population Problems", 4th Edn. McGraw Hill, New York, 1953.

[126] Landis P.H, and Hatt, P.K. "Population Problems. A Cultural Interpretation", 2nd Edn. American Book Company, New York, 1954.

[127] Bogue, D.J. "The Population of the United States", Free Press of Glencoe, Illinois, 1959.

[128] U.S. National Resources Committee on Population Problems "The Problems of a Changing Population", Washington D.C.1938

[129] Scripps Foundation for Research in Population Distribution, Publications NO's 1-13, Miami University, Oxford, Ohio.

The present study attempts to provide a more detailed study of population growth than was found available in the context of the Corn Belt. The procedure followed was firstly to establish the major trends and differentials and secondly to analyse in greater detail the characteristics of recent population growth.

1. THE INCREASE IN POPULATION 1900 - 1950

The half century from 1900 - 1950 was one of continuous population increase in the Corn Belt as a whole though at a lower rate than in the previous decades and with a marked variation in the rate of increase. Diagram 30[130] indicates both the numerical change and the rate of change in the population of the Corn Belt as defined in 1950. From Diagram 30 three definite stages of growth may be distinguished in both the amount of growth and the rate at which it occurred.

1. 1900 - 1920: A large numerical increase occurred of from 11.94 millions to 13.26 millions, at an increasing rate of growth reaching a high point of 6.9% in 1920.

2. 1920 - 1940: A much lower numerical increase occurred from 13.26 to 14.14 millions at a declining rate of increase reaching a low point of 2.9% in 1940.

3. 1940 - 1950: A rapid increase occurred during the decade from 14.14 to 16.05 millions at a very high rate of 7.9%

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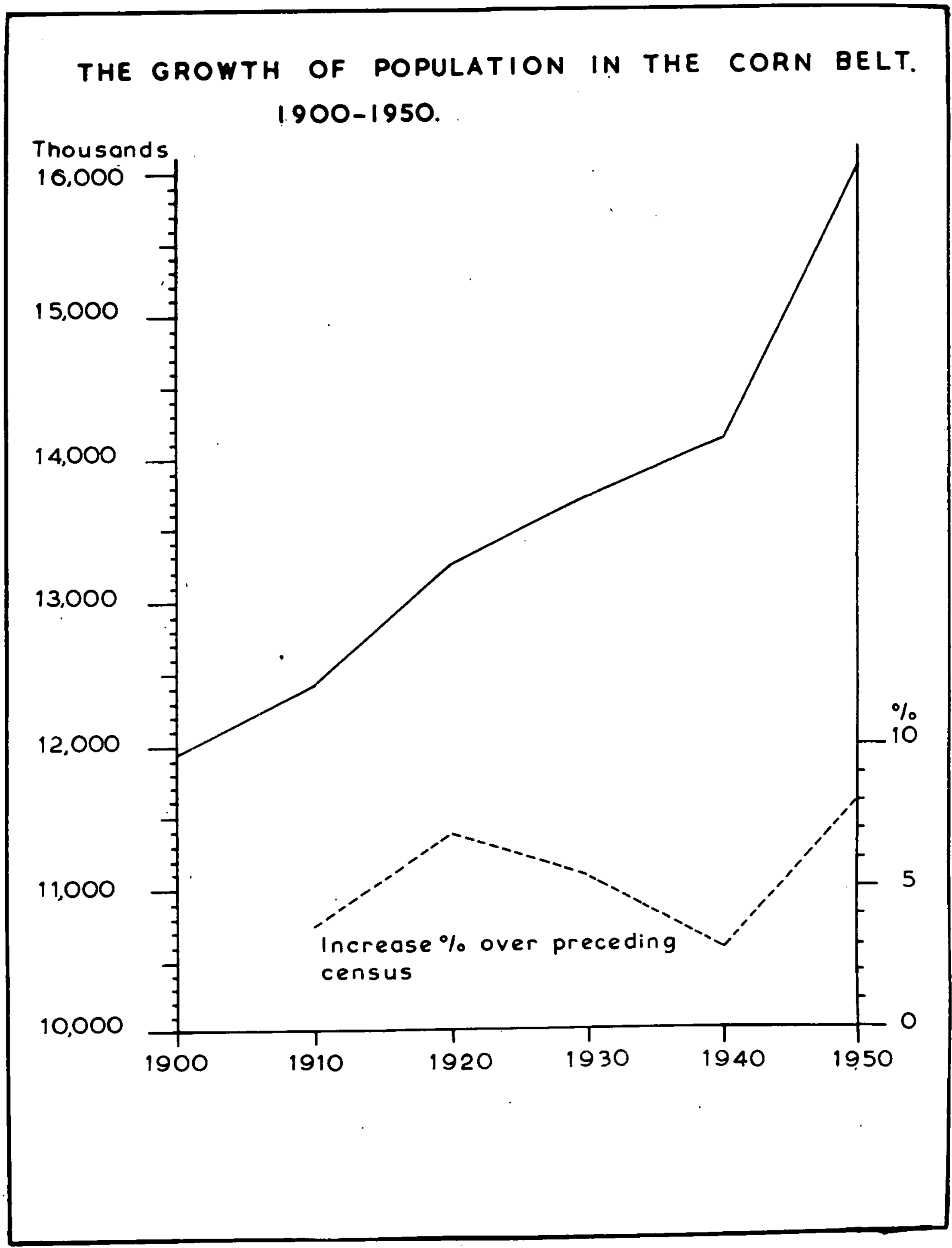
[130] Diagram 30 constructed from U.S. Bureau of the Census, Census of Population, 1950, Volume ii, Characteristics of the Population, Table 1.


THE GROWTH OF POPULATION IN THE CORN BELT. 1900-1950.
Thousands
16,000
15,000
14,000
13,000
12,000
11,000
10,000
1900
1910
1920
1930
1940
1950
%
10
5
0
Increase % over preceding census

This trend followed almost exactly the national trend of population growth[131]. One determinant of this trend in the total population was the well known decline in the birth rate after 1925 which persisted through the Depression years and up until the Second World War and which was followed in the post war decade by an upsurge in the birth rate.

However, when individual Corn Belt states are considered significant contrasts emerge. Gentilcore has shown that Indiana experienced a continuous increase in numerical growth at rates closely corresponding with those of the Corn Belt as a whole and with the national trend.[132] Table 71 below indicates that other Corn Belt states experienced rather different trends.

TABLE 71

RATE OF POPULATION INCREASE 1900 - 1950 IN FOUR SELECTED CORN BELT STATES

STATE	Increase % over previous decade					
	1900	1910	1920	1930	1940	1950
Indiana	14.8	7.3	8.5	10.5	5.8	14.8
Iowa	16.7	-0.3	8.1	2.8	2.7	3.3
Nebraska	0.3	11.8	8.7	6.3	-4.5	0.7
Illinois	26.0	16.9	15.0	17.7	3.5	10.3

Source: U.S. Bureau of the Census, Census of Population, 1950 Volume 11. Characteristics of the Population, Table 1.

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[131] For a description of the national trend, Vide Geddes, A. "Variability in Population Change in the U.S.A. and Canada, 1900-1951". Geographical Review, Vol.44. 1954.

[132] Gentilcore, R.L., "Curves of Population Change in Indiana, 1850-1950", Proceedings of the Indiana Academy of Science 1952, Vol.62, Bloomington, Indiana, 1953.

Diagram 31 illustrating Table 71 above indicates that Indiana and Illinois had similar growth trends which contrasted with those of Nebraska and Iowa. Whereas Indiana and Illinois experienced continuous numerical increase of population and with the drastic decrease of the rate of growth occurring after 1930, Iowa and Nebraska both experienced periods of actual decrease in population and the decrease in the rate of growth commenced earlier. The reasons for these contrasted growth trends concerned chiefly the differences in economic activity expressed in contrasted urban-rural composition. This is brought out in Table 72 illustrated by Diagram 32.

TABLE 72

DIFFERENTIAL GROWTH OF URBAN AND RURAL POPULATION IN FOUR SELECTED CORN BELT STATES

1900 - 1950

Increase % over preceding decade

1. RATE OF INCREASE OF URBAN POPULATION

State	1900	1910	1920	1930	1940	1950
Indiana	46.2	32.6	29.6	21.1	5.1	17.5
Iowa	41.1	18.8	28.7	11.9	10.7	13.4
Illinois	52.2	33.0	26.5	28.0	3.1	11.7
Nebraska	-13.4	23.0	30.4	19.9	5.8	18.0

2. RATE OF INCREASE OF RURAL POPULATION

Indiana	3.2	-5.8	-7.0	-0.3	6.8	11.5
Iowa	10.2	-6.9	-1.0	-2.4	-2.5	-4.5
Illinois	4.7	-2.1	-3.6	-4.2	4.6	6.6
Nebraska	5.5	8.3	1.1	0.1	-0.1	-1.3

Source: U.S. Bureau of the Census, Census of Population, 1950 Volume ii. Characteristics of the Population, Table.1

DIAG. 31.

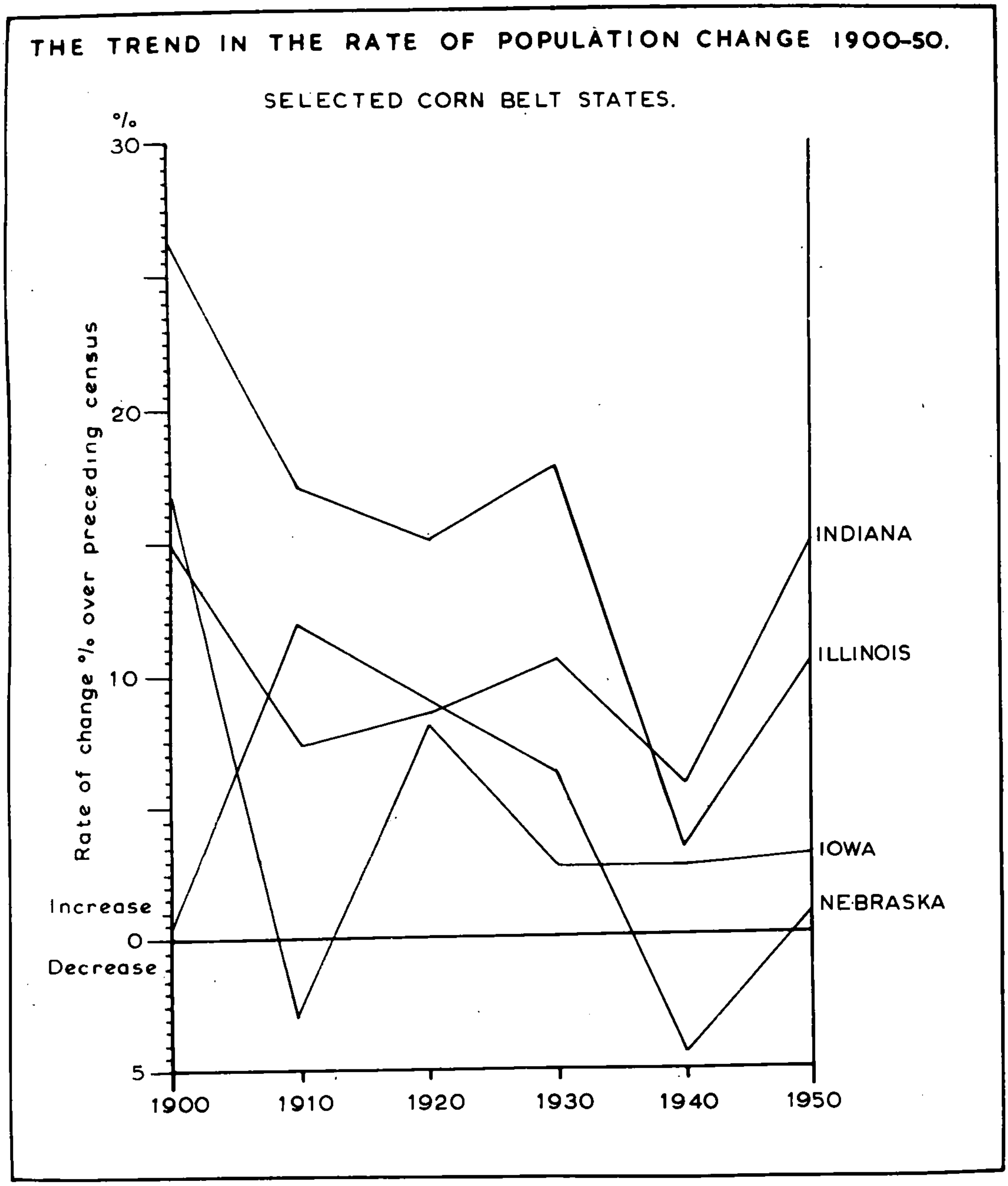
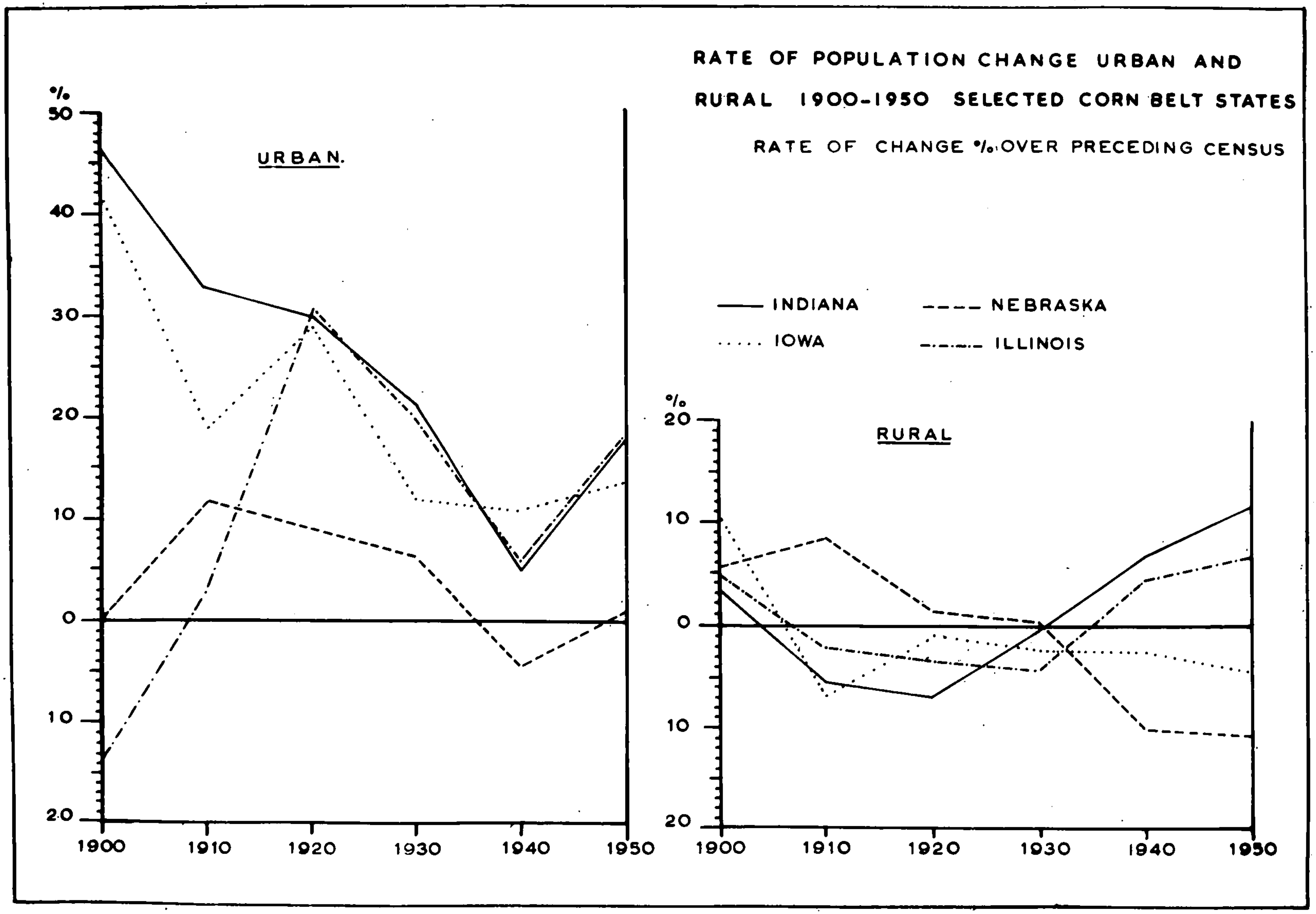

THE TREND IN THE RATE OF POPULATION CHANGE 1900-50.
SELECTED CORN BELT STATES.
%
30
20
10
0
5
Increase
Decrease
Rate of change % over preceding census
1900
1910
1920
1930
1940
1950
INDIANA
ILLINOIS
IOWA
NEBRASKA

Diagram 32 indicates that in all four states the urban rate of growth was consistently higher than the rural, and that although the rate of growth of urban population decreased in all four states until after 1930 there was no actual decrease in total urban population with the single exception of Nebraska in the decade 1930 - 1940. On the other hand all four states experienced some numerical loss of rural population during the half century. Nebraska and Iowa have lost rural population continuously and while the rural population of Indiana and Illinois has increased at a high rate since 1930 Iowa and Nebraska have continued to lose rural population.

The inference from the contrasted urban and rural growth trends must be that the population changes from 1900 to 1950 cannot be explained solely by the fluctuation of the birth rate but were directly related to patterns of internal migration brought about by economic conditions. It was indicated in the previous chapter that the dominant movements of population within the Corn Belt were from rural to urban residence. This redistribution of population is clearly shown in the trend in the residential composition of the population as tabulated below.

DIAG. 32.



RATE OF POPULATION CHANGE URBAN AND RURAL 1900-1950 SELECTED CORN BELT STATES

RATE OF CHANGE % OVER PRECEDING CENSUS

TABLE 73

THE CHANGE IN THE PROPORTION URBAN AND RURAL, 1900 - 1950, IN FOUR SELECTED CORN BELT STATES

1. % Total Population Urban

STATE	1900	1910	1920	1930	1940	1950(1)
Indiana	34.3	42.4	50.6	55.5	55.1	56.4
Illinois	54.3	61.7	67.9	73.9	73.6	74.5
Iowa	25.6	30.6	36.4	39.6	42.7	46.9
Nebraska	23.7	26.1	31.3	35.3	39.1	45.8

2. % of Total Population Rural

Indiana	65.7	57.6	49.4	44.5	44.9	43.6
Illinois	45.7	38.3	32.1	26.1	26.4	25.5
Iowa	74.4	69.4	63.6	60.4	57.3	33.1
Nebraska	76.3	73.0	68.7	64.7	60.9	54.2

Source: U.S. Bureau of the Census, Census of Population, 1950 Volume ii. Characteristics of the Population, Table.1

(1) According to the 1940 definitions of urban

Table 73 indicates that in the selected states the urban proportion of the total population increased by some 20% during the fifty years at the expense of the rural proportion. By 1950 the urban proportion predominated in Indiana and Illinois and constituted almost half the population of Iowa and Nebraska. The figures indicate that the greatest increases in the urban proportion occurred in the decades from 1900 to 1930, a period of industrial expansion in the cities of the Corn Belt, coinciding during 1920 - 1930 with a depression in agriculture during which there was considerable rural depopulation. Industry too suffered depression during

1930 to 1940 and there was a marked decrease in the rate at which the urban proportion was increasing.[133] Finally, in the decade 1940 - 1950 the urban proportion again increased significantly. Moreover the trend towards urban residence was reflected in the farm non-farm ratio within the rural population. This is illustrated by Table 74 for the decades 1930 to 1930 and Diagram 33.

TABLE 74

THE FARM - NON-FARM COMPOSITION OF RURAL POPULATION, 1930 - 1950 IN FOUR SELECTED CORN BELT STATES

% of Total Population

	Indiana			Illinois		
	1930	1940	1950	1930	1940	1950
Rural Farm	25.0	21.2	17.0	13.0	12.3	8.8
Rural Non-Farm	19.6	23.7	26.7	13.2	14.2	16.8

	Iowa			Nebraska		
Rural Farm	39.0	36.1	29.9	42.3	37.7	29.5
Rural Non-Farm	21.3	21.2	23.2	22.4	23.3	24.7

Source: U.S. Bureau of the Census, Census of Population, 1950 Volume ii. Characteristics of the Population, Table 13.

It is evident from Table 74 that in the four states the rural non-farm proportion made considerable gains at the expense of the farm proportion of the total population. By 1930 the non-farm element exceeded the farm in Illinois and by 1940 in Indiana also while in Iowa and Nebraska the dominance of the farm element was vastly reduced. This trend

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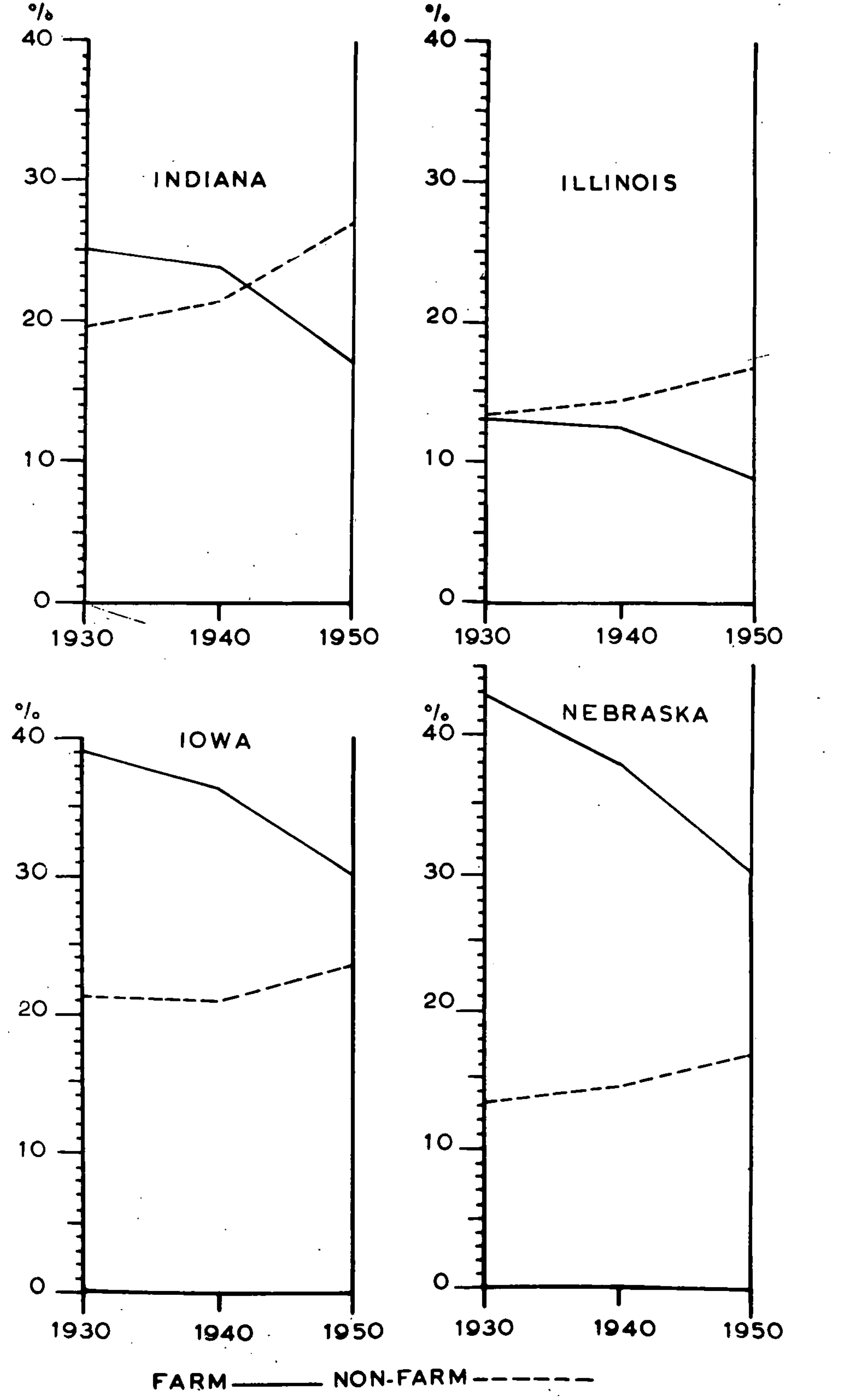
[133] For a detailed description of the trend in the economy vide Patton, R.D., "The American Economy", Chapters 10 - 16 Scott, Foresman and Co., Chicago 1953.

THE TREND IN THE FARM-NON-FARM RATIO 1900-50.

SELECTED CORN BELT STATES



reflected the reduction in the agricultural labour force after 1920 and the concentration of the rural force in activities outside agriculture directly, which it was shown in the previous chapter frequently involved migration.

The trend of population growth therefore involved more than just a change in the rate of increase in the total population brought about by fluctuations in the birth rate. It also involved great changes in the residential composition of the population brought about by changes in economic circumstances. This change in residential composition can be further illustrated by reference to the actual type and size of settlement. Table 75 in the Appendix summarises the changes in the residential composition of four selected states, while Diagram 34 illustrates the examples of Indiana and Iowa.

Diagram 34 subdivides urban and rural settlement and then further subdivides on a basis of settlement size. The diagram shows graphically that the greatest increase in urbanisation took place in the period of industrial expansion from 1900 to 1930, especially in the case of Indiana. During and after the industrial depression the trend was for an increase in the proportion of the population in the larger cities, noticeable in Indiana and to a lesser extent in Iowa, corresponding with suburban growth in the large metropolitan cities. In the case of the rural population it is noticeable that the relative proportions of the total rural population in villages of 1,000 to 2,500 inhabitants, hamlets of under 1,000 inhabitants and in dispersed rural settlement remained constant. This suggests that rural depopulation was from all three categories and that population has moved from rural to urban residence rather than any increase in the significance of the small rural settlements.[134]

Diagram 34 indicated that it was the large metropolitan cities that increased their proportion of the total population most substantially and were the chief destinations of rural out-migration. This is shown for all the major Standard Metropolitan Areas in more detail by Table 76 in the Appendix and illustrated by Diagram 35.

Diagram 35 indicates the growth of the Standard Metropolitan Areas of the Corn Belt during the decade 1940 to 1950 and also differentiates between the significance of net migration and net reproduction as factors in their growth. In most metropolitan areas the increase was high, during a decade of great industrial expansion characterised also by high birth rates. However, despite the increased birth rates in most cases at least a third of the increase was due to net

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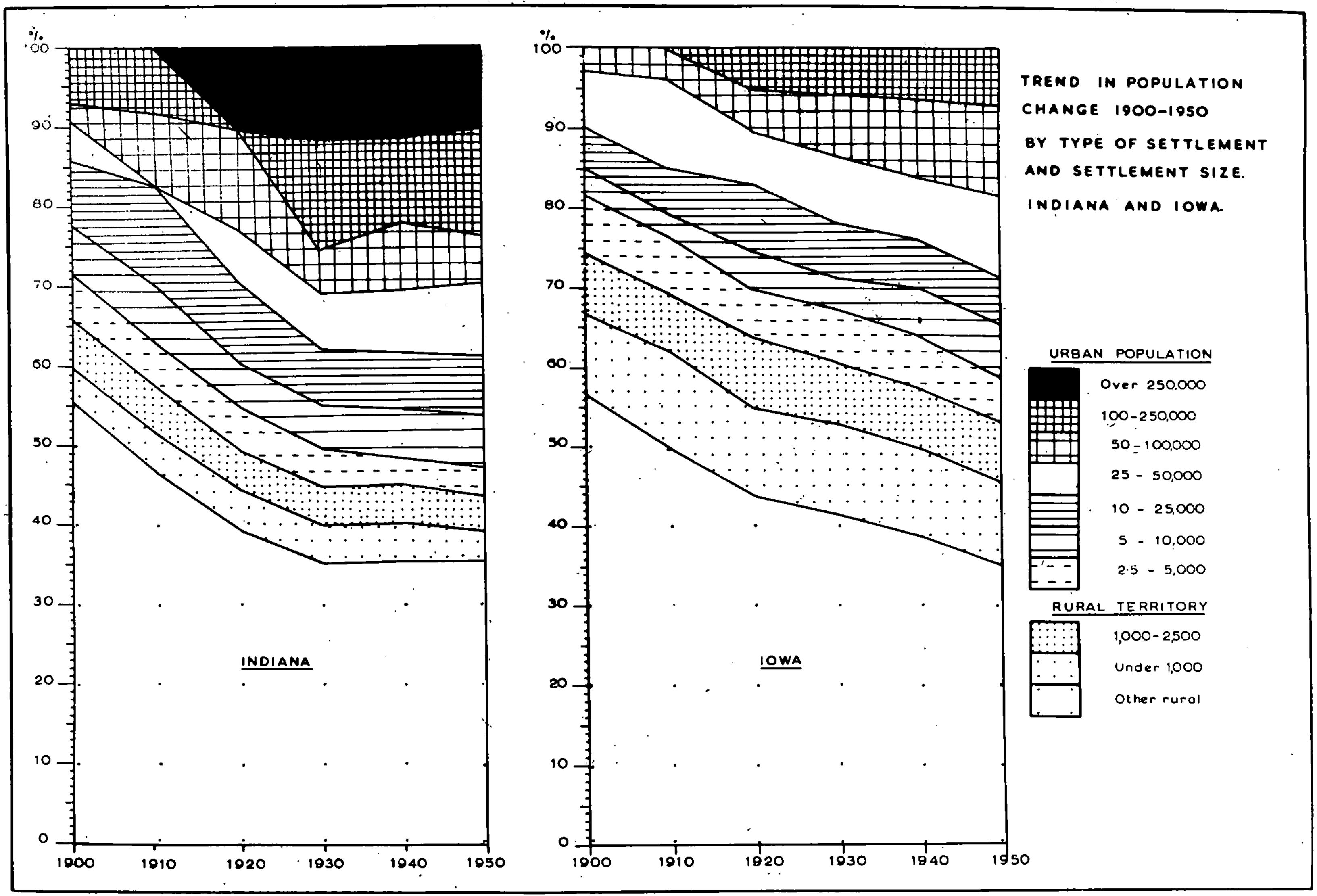
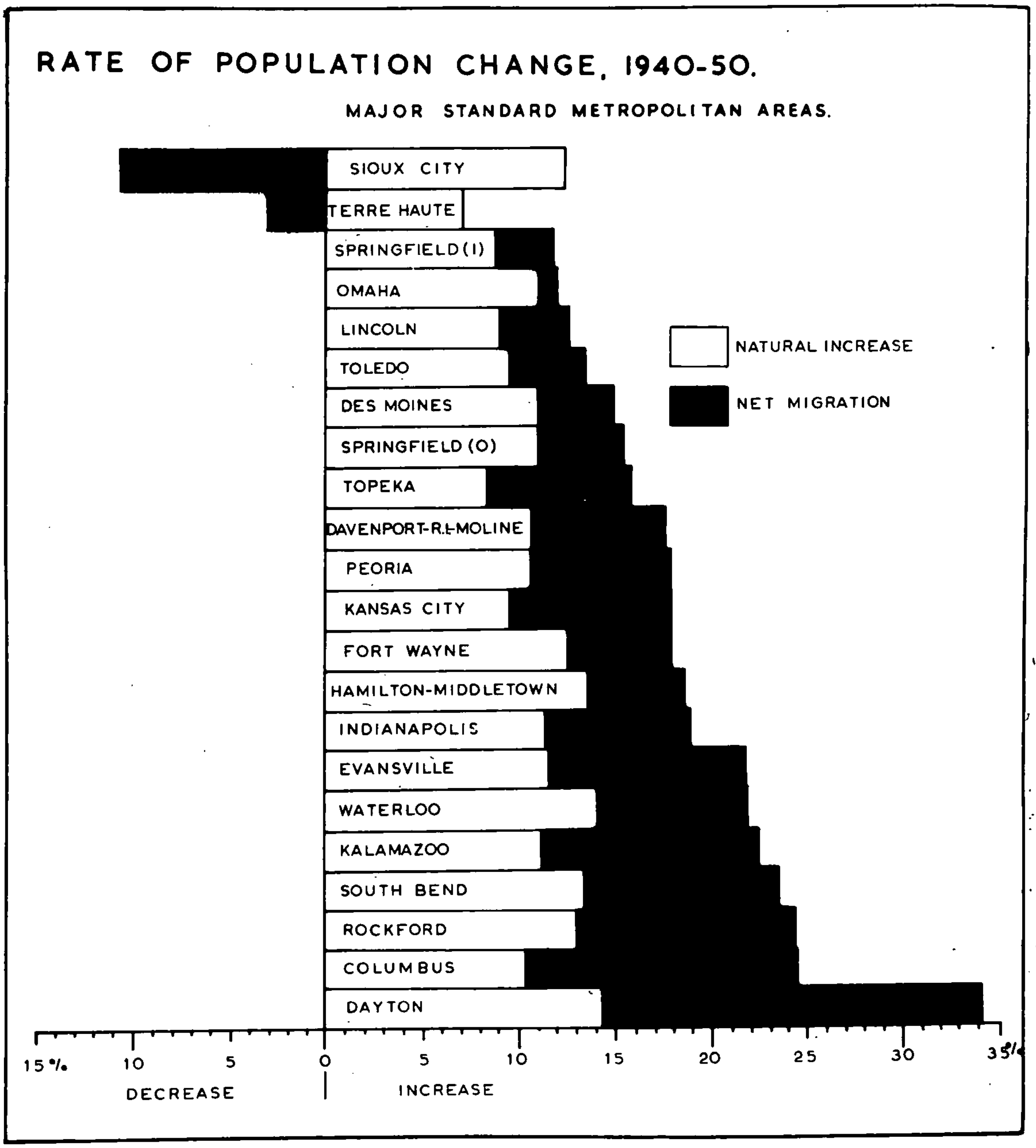
[134] For a description of population trends in villages with reference to Indiana vide Lal A., "Population trends in Indiana's villages of 1,000-2,500 in 1950". Proceedings of the Indiana Academy of Science, Vol.66, 1956, Bloomington, Indiana, 1957.

DIAG. 34.



TREND IN POPULATION CHANGE 1900-1950 BY TYPE OF SETTLEMENT AND SETTLEMENT SIZE. INDIANA AND IOWA.

DIAG.35.



RATE OF POPULATION CHANGE, 1940-50.

MAJOR STANDARD METROPOLITAN AREAS.

migration and this is shown to have been the case particularly of the most industrialised cities. Table 76 also differentiates between the rate of growth of the Central City and the Metropolitan Rings. This illustrates the almost universal trend towards suburbanisation.

2. PERIODS IN THE POPULATION GROWTH OF THE CORN BELT, 1900-1950

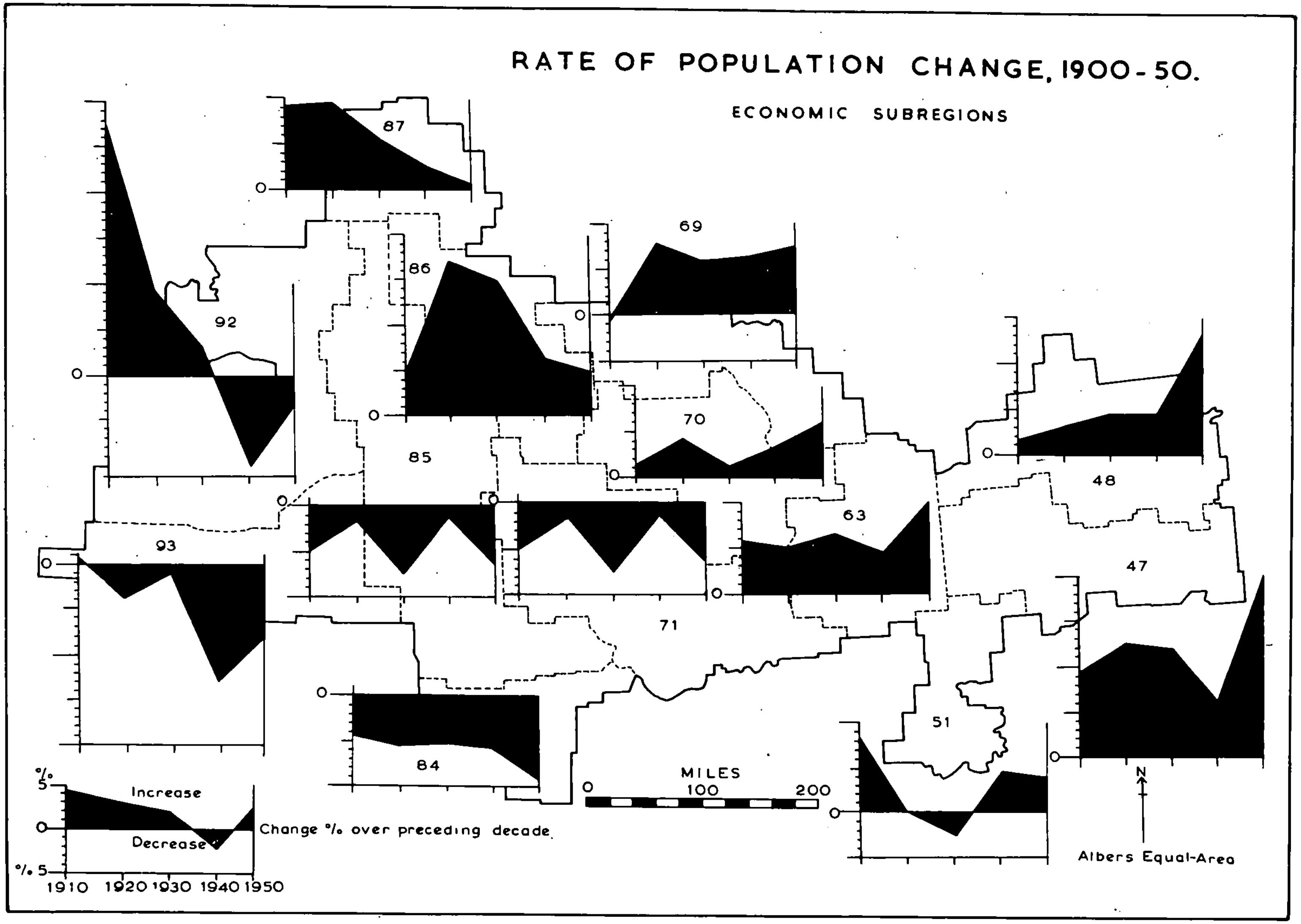
The first section of this chapter has outlined the characteristics of overall population increase since 1900 and indicates in particular the different rural and urban trends. It is now possible to subdivide the half century into the contrasted growth periods and describe the demographic and related economic factors involved. Unfortunately the decennial nature of the census precludes a strict subdivision and significant fluctuations in the intercensal years are hidden. However two major national circumstances affecting population matters were the disruptions in normal social patterns caused by the economic depression of the early thirties and the Second World War. Accordingly the following periods of contrasted growth characteristics may be suggested; - 1900 - 1930, 1930 - 1940, and 1940 - 1950.

Map 50 indicates the rate of population change in the economic subregions of the Corn Belt after 1900. There is an obvious contrast between the predominantly rural and agricultural southern and western subregions which experienced

MAP 50.

RATE OF POPULATION CHANGE, 1900-50.

ECONOMIC SUBREGIONS


87
69
86
92
70
85
48
63
93
47
71
51
84
O
MILES
100
200
N
Albers Equal-Area
%
5
Increase
O
Decrease
% 5
1910
1920
1930
1940
1950
Change % over preceding decade

a decrease in population and the eastern subregions with a higher urban and industrial population which experienced continuous increase in population though at a varying rate. It has already been shown that this contrast reflected the differential growth of rural and urban population and involved migration rather than natural increase.

(1) 1900 - 1930

It has been indicated that in the period 1900 to 1930 the Corn Belt experienced a two-fold trend in population growth. This involved a decline in the agricultural economy and a loss of rural, especially rural farm population by migration and a vast increase in urban population coinciding with industrial expansion and absorbing the migratory rural population into the urban labour force. The decline in the strength of the agricultural economy was ironically a product of improvements in farming itself. The improvements of agriculture, especially by the increase of mechanisation and in particular the replacement of animal traction by the internal combustion engine resulted in increases in per acre and per capita production, a vital factor being the freeing of much land from feed crops for commercial production. The period 1921 - 1926 was one of unprecedented high production and the large surpluses of 1926 - 1931 resulted in a need for a drastic federal farm programme. The depression in agriculture preceded that in industry and the result was that the gradual drift from the land became increasingly acute. This rural exodus at first represented the surplus rural population, the product of a high birth rate, which as mechanisation increased could not be absorbed in the agricultural labour force, but after 1920 also included a large number of actual farm operators leaving agriculture as the commercial situation worsened. The migration of farm operators was in part facilitated by the high proportion of tenancy since the tenant farmer had a higher degree of mobility than the owner-operator.[135] In fact the decade 1920 - 1930 was one of farm depopulation throughout much of the commercial agriculture of the country. Map 50 indicates that in the southern and western subregions of the Corn Belt loss of population by migration exceeded the natural increase and it was indicated in the last chapter (vide Map 46) that this situation still persisted in large areas during the decade 1940 - 1950. Baker [136] has estimated that during the decade 1920 to 1930 at least 6 million persons (net) migrated to the cities of the United States and that of these migrants 5 million came from the nation's farms. Approximately 1.3 million (net) moved from farms to rural non-farm residence and the same number from rural non-farm to urban centres. Table 77 below indicates the loss of farm population in selected Corn Belt states during this decade.

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[135] The trends and changes in tenancy and ownerships in the Corn Belt are described in "Farm Ownership in the Mid West". North Central Regional Publication No. 13. Ames. Iowa, 1949.

[136] Vide Baker, O.E. Op. Cit, 121

TABLE 77

NET MIGRATION FROM FARMS 1920 - 1930 IN FOUR SELECTED CORN BELT STATES

	Net Loss by migration	Rate of Loss (Loss as % of 1920 farm population)
Indiana	166,000	18.4
Illinois	213,000	19.6
Iowa	155,000	15.8
Nebraska	95,000	16.2
	729,000	

Baker, O.E. Op. Cit. 121. pp. 29 and 30

This decline in rural farm population was almost exclusively a result of migration since there was no significant decline in the birth rate in evidence before 1925, with the temporary exception of the war years 1914-1918. The decrease was a product of the migration of rural farm population to the urban centres which reached a peak during the recession in agriculture after 1920.

The vast expansion in urban population which was noted as the second trend in the period 1900 - 1930 reflected in part the overflow of rural population after the completion of occupation of free land in the 1890's and in part the growth of industrialisation related to the economic development of the nation as a whole. Therefore the rapid increase in the urban population of the Corn Belt that was described in the first section of this chapter should be seen in the light of drastic changes in the occupational structure of the entire nation from a dominance of agriculture to a concentration of the labour force in secondary and tertiary employment.[137] The growth of urban centres was facilitated by migration from rural areas on an unprecedented scale based almost entirely on economic opportunity. This process involved some considerable redistribution of population in the Corn Belt since the expanding industrial centres were located predominantly in the earlier-settled eastern areas. The result was to increase the concentration of the Corn Belt population in the East Central Lowland and Lower Great Lakes regions which today forms the major contrast in the population geography of the Corn Belt. The two processes of rural depopulation and urban expansion were economically inter-linked since the expansion of industry facilitated the increased production of agricultural machinery, especially tractorised mechanisation, while the surplus rural labour force thus created was absorbed in industry and in urban functions.

Essentially the period 1900 - 1930 was one of redistribution of population in response to changing economic circumstances and was a crucial stage in the evolution of the

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137. Vide Truesdell, L.E. "*Growth of Urban Population in the United States*", *Congrès International de la Population*, Paris 1937, Vol. IV, p.108 for a consideration of the relation between urban growth and changes in employment in this period.

present population geography.

(2) 1930 - 1940

The trend in population growth between 1930 and 1940 was complicated by two main circumstances, the industrial depression and a sharp decrease in the birth rate though the two were not entirely functionally related as was once assumed. In fact the birth rate of the nation had been declining for a century but at a steady rate until the sharp decrease after 1924. The decrease in the birth rate therefore preceded the industrial depression and persisted through it. Although the birth rate fell rapidly after 1924 this did not immediately affect the growth of the labour force until some 15 to 20 years later when the children born in this period had matured to employment age. In fact the number of persons entering the labour force continued to increase in the early 1930's at a time when industry was least able to absorb additional manpower. A further complication was the effect of the differential urban-rural birth rates. The decrease in the urban birth rate occurred earlier and more emphatically than in the case of rural population. Before 1930 the urban populationsthroughout the Midwest were not replacing themselves and the continued growth of urban centres was due to the migration of rural population sustained by an appreciably higher birth rate. The most immediate effect of the depression was a considerable reduction in the volume of net migration from rural to urban areas in the period

1935 - 1940 brought about by the reduction in industrial opportunity. In many parts of the nation there was even a "back to the land" movement but it has been demonstrated by Bogue,[138] and others that this was not significant in the Corn Belt. In fact rural-urban migration continued though at a reduced rate and increased as the economic situation improved so that despite the effect of the depression a considerable amount of population redistribution did occur during the decade.

The extent and direction of this redistribution is indicated by Map 51 which illustrates the change of population in the Corn Belt between 1930 and 1940 and differentiates between areas of decrease and areas of continued growth. An analysis of Map 51 indicates that there was an obvious contrast in terms of population growth between the Western Corn Belt west of the Missouri River and the West Central Lowland south-west of the Des Moines River, which experienced a substanial loss of population and the North-Central and Eastern Corn Belt which, with the exception of the Grand Prairie counties, experienced an increase in population during the decade. In detail, the areas which lost population were the most rural and exclusively agricultural in the entire Corn Belt where consolidation of farm lands and increased mechanisation would

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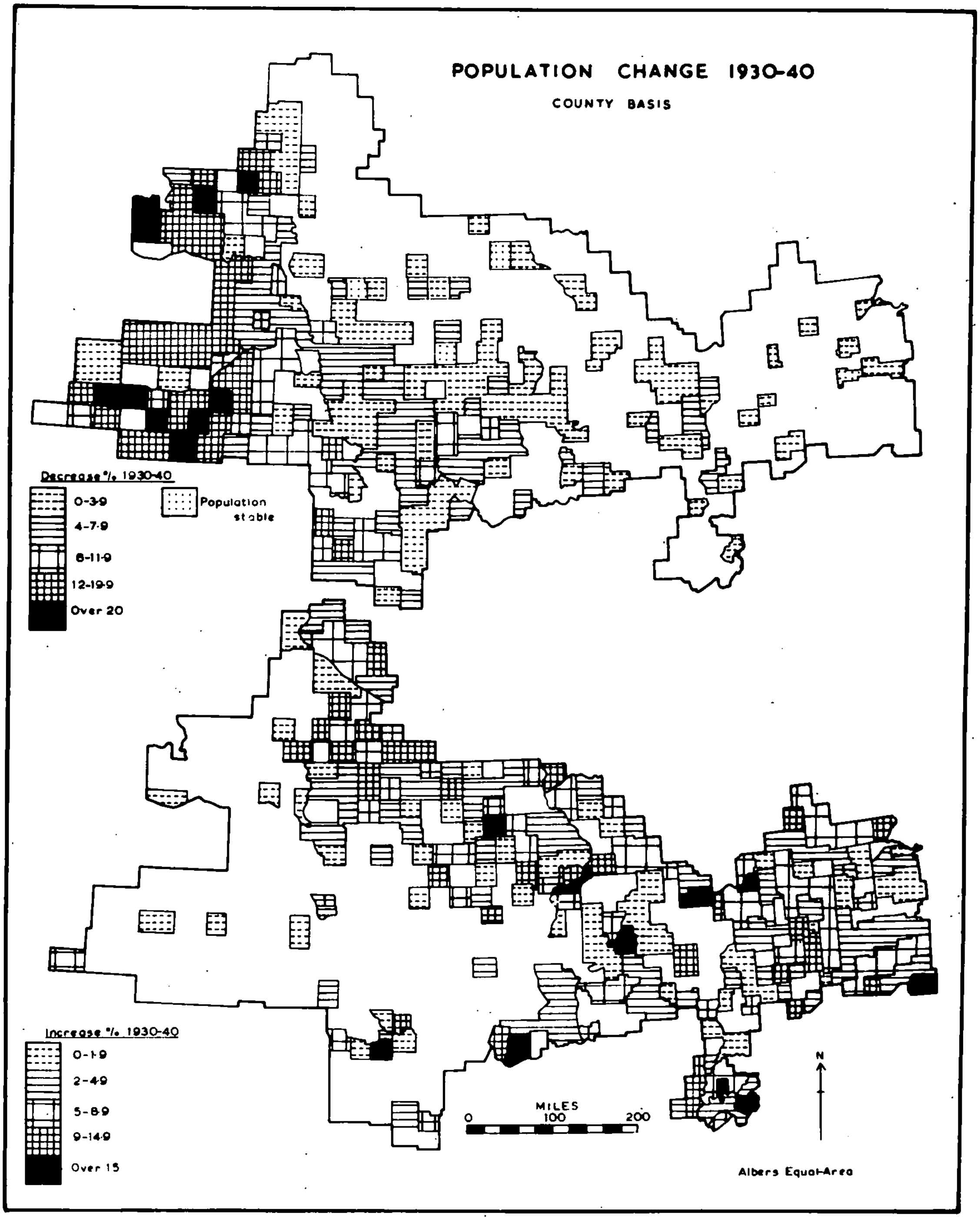
[138] Bogue, D.J. and Hagood, M.J. and Bowles, G.K. "Subregional Migration in the United States, 1935-40, Differential Migration in the Corn and Cotton Belts". Scripps Foundation for Research in Population Distribution, Publication No. 6. Miami University, Oxford, Ohio, 1953.

MAP 51.


POPULATION CHANGE 1930-40
COUNTY BASIS
Decrease % 1930-40
0-3·9
4-7·9
8-11·9
12-19·9
Over 20
Population stable
Increase % 1930-40
0-1·9
2-4·9
5-8·9
9-14·9
Over 15
MILES
0
100
200
N
Albers Equal-Area

have a severe effect on rural employment opportunities. The areas of highest increase of over 15% were essentially the counties containing large urban centres. In fact the widespread increase in population in the urbanised Eastern Corn Belt represented a continuation of migration from rural to urban areas since the urban populations of the Corn Belt were not at this stage replacing themselves by natural increase. The increase experienced in the North Corn Belt in the predominantly rural counties of Northern Iowa and South West Minnesota was chiefly in the lower range of 2 - 4.9% and may be attributed to natural increase in an area where loss of rural population by migration was less severe in an agricultural system that was pastoral rather than arable and in which mechanisation was less significant.

Further light on the redistribution of population during the depression decade is cast by Map 52 which illustrates net migration ofrural farm population between 1930 and 1940.[139] Map 52 indicates that net loss by migration was universal in the Corn Belt with the exception of a small enclave on the Indiana-Michigan border which experienced some "back to the land" movement. Moreover a comparison of Maps 51 and 52 reveals an exact spatial coincidence between the areas of greatest population decrease and areas of heaviest loss of farm population by migration in the decade. Conversely, since

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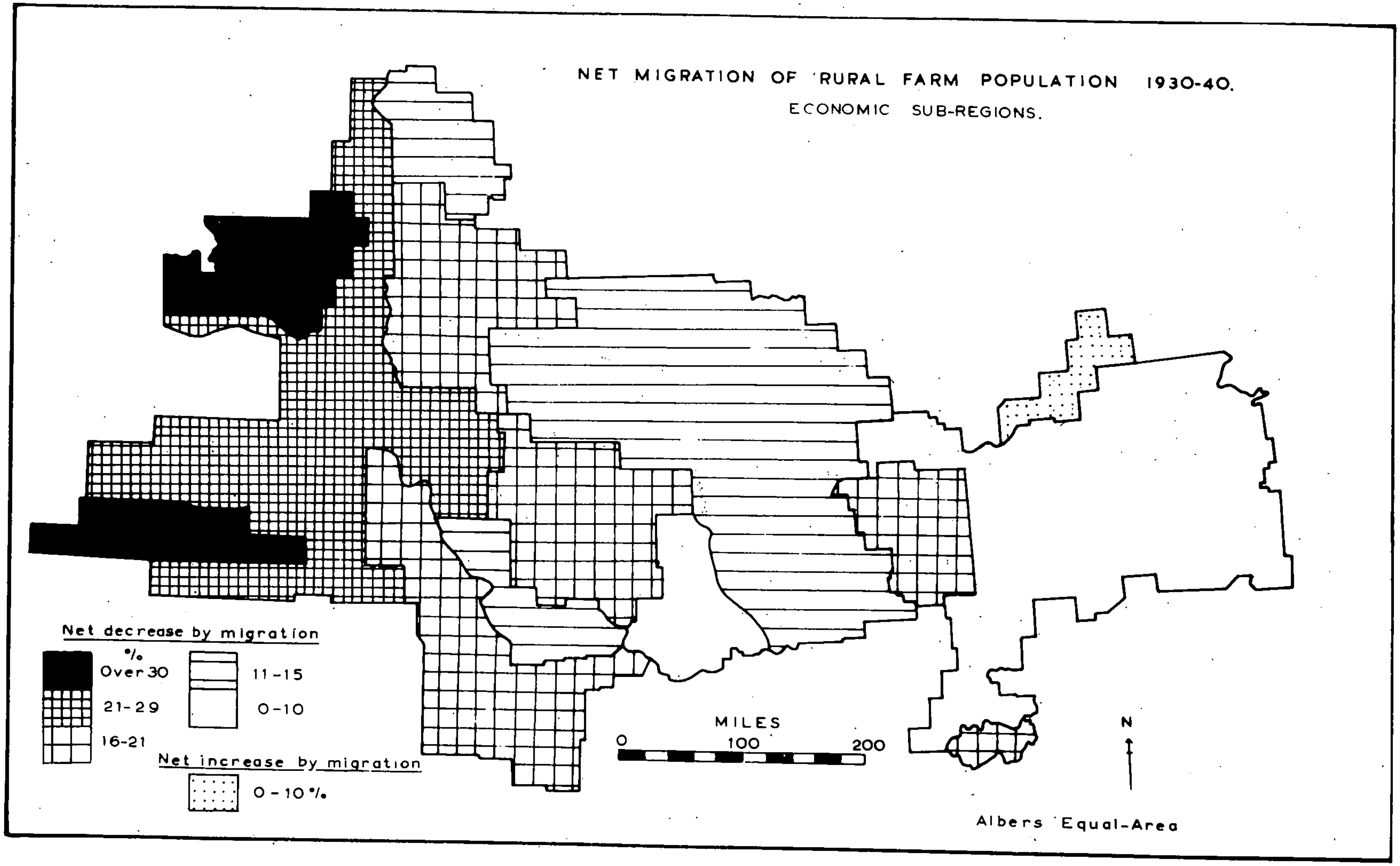
139. Map calculated from Jehlik and Wakeley, Op.Cit 109. Appendix C.

MAP 52.



NET MIGRATION OF RURAL FARM POPULATION 1930-40.

ECONOMIC SUB-REGIONS.

Net decrease by migration
%
Over 30
21-29
16-21
11-15
0-10
Net increase by migration
0-10%.
MILES
0
100
200
N
Albers Equal-Area

net loss of rural farm population by migration was universal this migration must have been either out of the Corn Belt altogether, or to non-farm residence in the urbanised eastern section of the Corn Belt which increased substantially despite a declining birth rate, which in the case of the cities in particular had fallen below replacement level.

It may be concluded that the decade 1930 - 1940 was a period of modification of population growth of the previous decades rather than a complete reversal. The exodus of farm population continued and despite the depression urban population increased in the face of a declining birth rate. In short, the economic depression and the decline in the birth rate effected a slowing down of the pace of rural depopulation and urban expansion but did not halt the process of redistribution of population.

(3) 1940 - 1950

In the preceding chapters frequent reference to the characteristics of population growth in the decade 1940 - 1950 has already been made, especially in the case of the description of internal migration, which to some extent anticipated this final section. These previous statements must now be drawn together and in particular it is necessary to stress those dynamic elements of population growth and redistribution which have influenced the detailed distribution and density of population at the latest census which is analysed in the concluding chapter.

It has been shown in this chapter that the Corn Belt experienced a substantial increase in population during the decade of from approximately 14 million inhabitants to slightly over 16 million, at a rate for the decade of 8%. This increase was accounted for by natural increase facilitated by the upturn in the birth rate since despite considerable internal redistribution of population as described in the last chapter, the Corn Belt as a whole experienced a significant net loss by migration. The greatest increase occurred in the urban population which expanded at a very high rate while the rural population declined relatively and absolutely during the decade. The decline in the rural population was a feature of the farm element and rural non-farm population made significant gain. Although the growth in total population was shown to be related to natural increase and not net gain by migration, the increase in urbanisation was intensified by rural-urban migration within the Corn Belt, after a decade in which the rate of rural migration to urban centres had modulated. To this extent the pattern of growth was a reversion to the trend of the pre-1930 decades though at an intensified tempo and further exaggerated by increased birth rates.

The pattern of population growth between 1940 and 1950 has been shown in previous chapters to have had a profound effect on characteristics of population composition. The increase in the birth rate had the effect of diminishing even further the proportion of the foreign-born white population, already reduced in significance after the quota restrictions of 1921. The increase in negro migration on theother hand increased the significance of the nonwhite cultural element which was all the more emphatic for the marked localisation of negro population in coherent groups in the towns of the Corn Belt. In the case of the employment structure the rapid urban growth and continued rural depopulation in many sectors of the Corn Belt resulted in an intensification of the trend towards a reduction in the agricultural labour force and a concentration of manpower in the secondary and tertiary occupations. The abrupt upturn in the birth rate subsequent to over a decade of declining rates resulted in considerable distortion of the age structure nationally, which in the case of the Corn Belt was further complicated by the unbalancing effect of differential migration. Migration has been shown to have been age and sex selective and involved the removal from rural to urban residence a large proportion of the most fertile age groups. This was an important factor in the high rate of natural increase in the urban population during 1940 - 1950 and despite the increase in the specific birth rates in the rural population this implied a reduction in the rural rate of actual numerical increase.

Many other changes during the decade 1940 - 1950 have already been indicated and it is unnecessary to repeat them. It remains to describe more precisely the spatial distribution of population changes in the decade to facilitate a detailed consideration of characteristics of distribution and density at the last census.

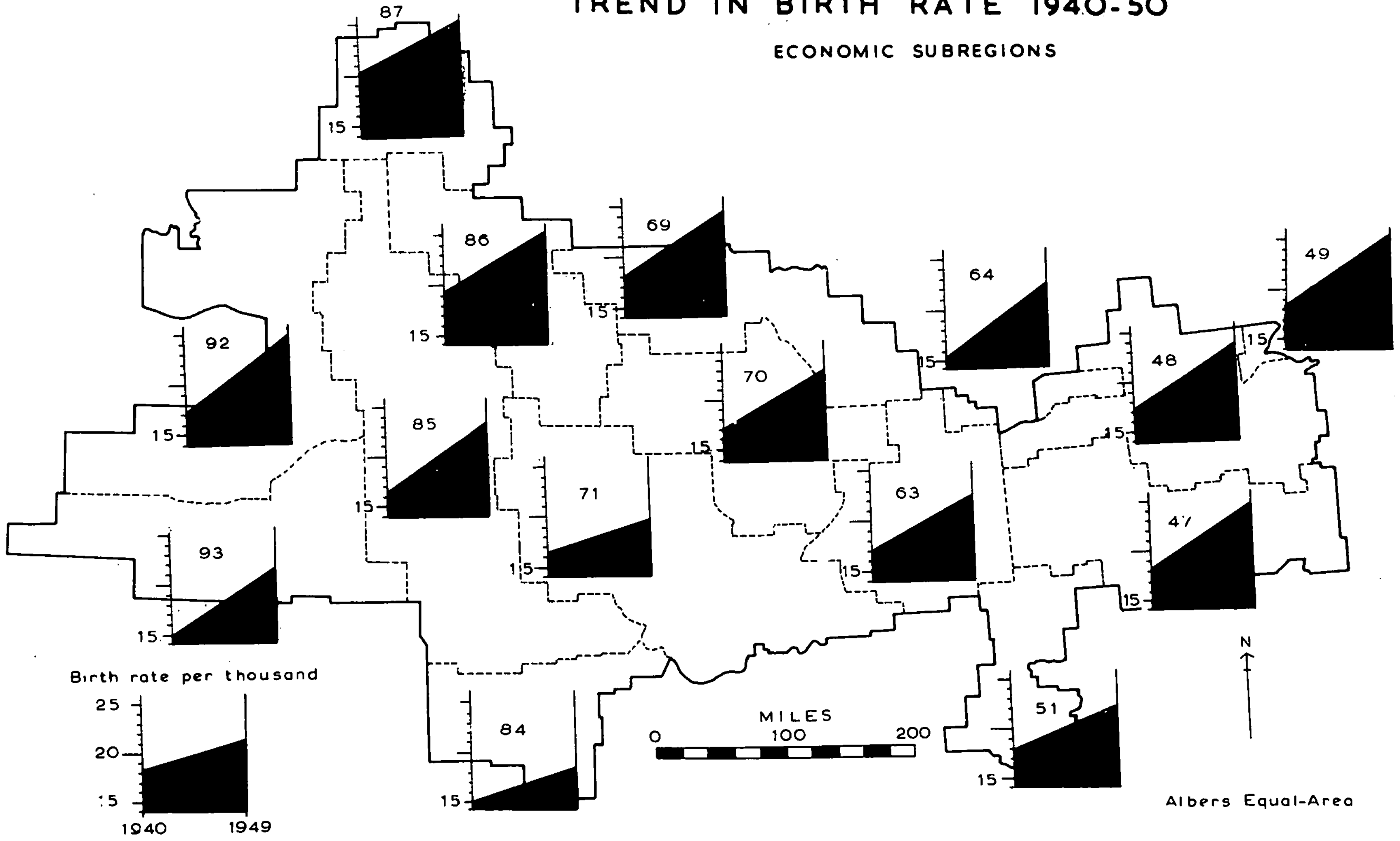
Three national circumstances were of significance in population matters within the Corn Belt during the decade. These were the recovery of the economy bringing increased industrial expansion and a return to the pre-depression trend of rapid urban growth, the incidence of the Second World War with its impetus to both agricultural and industrial production and disturbance of normal social patterns, and finally, the post-war increase in the birth rate.

The upturn in the birth rate was a new factor, following a century of steady decline in the birth rate which in the preceding decade had increased sharply in its descent. Map 53 indicates the trend in the crude birth rate between 1940 and 1950, that is, the number of live births per thousand inhabitants in the successive census years. It is seen from Map 53 that the increase in the birth

MAP 53.

TREND IN BIRTH RATE 1940-50

ECONOMIC SUBREGIONS



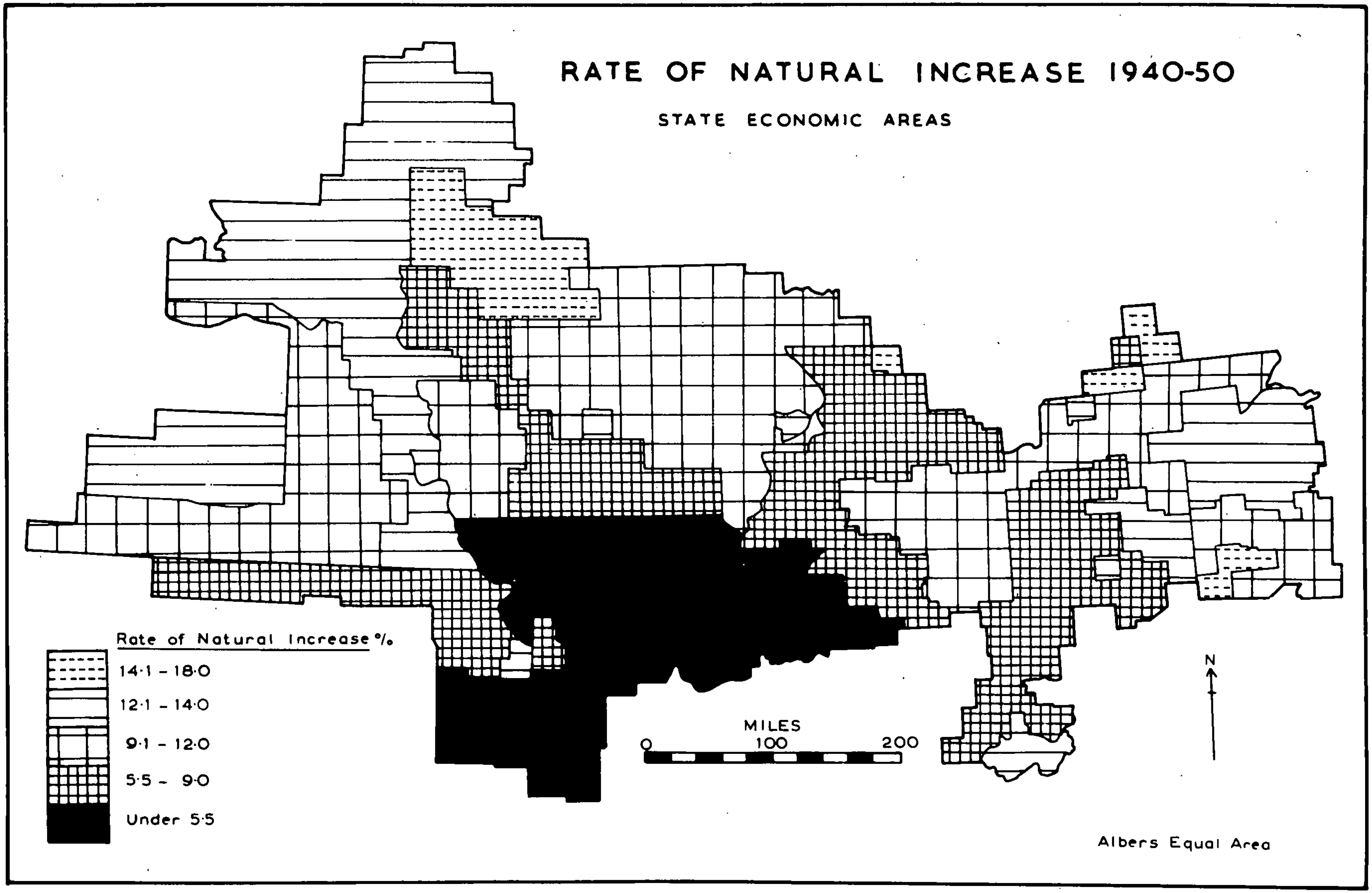
87
15
69
15
86
15
92
15
64
15
49
15
48
15
70
15
85
15
71
15
63
15
47
15
93
15
84
15
51
15
Birth rate per thousand
25
20
15
1940
1949
MILES
0
100
200
N
Albers Equal-Area

rate was universal and substanial but with some regional variation. The highest increase in the birth rate occurred in those economic subregions which had a high proportion of urban population, that is precisely those which had experienced drastic reductions in the previous decade. On the other hand in those rural areas which had experienced rural depopulation, as for instance subregions 71 and 84, the upturn in the birth rate was much lower.

These regional contrasts may be restated by reference to the rate of natural increase, expressed in Map 54 as the excess of births over deaths during the decade as a percentage of the 1940 population. Map 54 shows that high rates of natural increase of over 14.1% occurred in certain metropolitan areas of the Corn Belt and also in a predominantly rural area of the Iowa-Minnesota boundary, while the lowest rates of under 5.5% were experienced in the Southern Corn Belt in Missouri and Kansas which were areas of heavy out-migration and actual rural depopulation.

The high urban rates of natural increase are readily explained by the concentration of the more fertile age groups in the urban centres as a result of age selective rural-urban migration which in conjunction with the general uptrend in the birth rate resulted in a large urban numerical increase. In the same way, the high rate of natural increase in the rural area of the Iowa-Minnesota border must be

MAP 54.



RATE OF NATURAL INCREASE 1940-50

STATE ECONOMIC AREAS

Rate of Natural Increase %
14·1 - 18·0
12·1 - 14·0
9·1 - 12·0
5·5 - 9·0
Under 5·5
MILES
0
100
200
N
Albers Equal Area

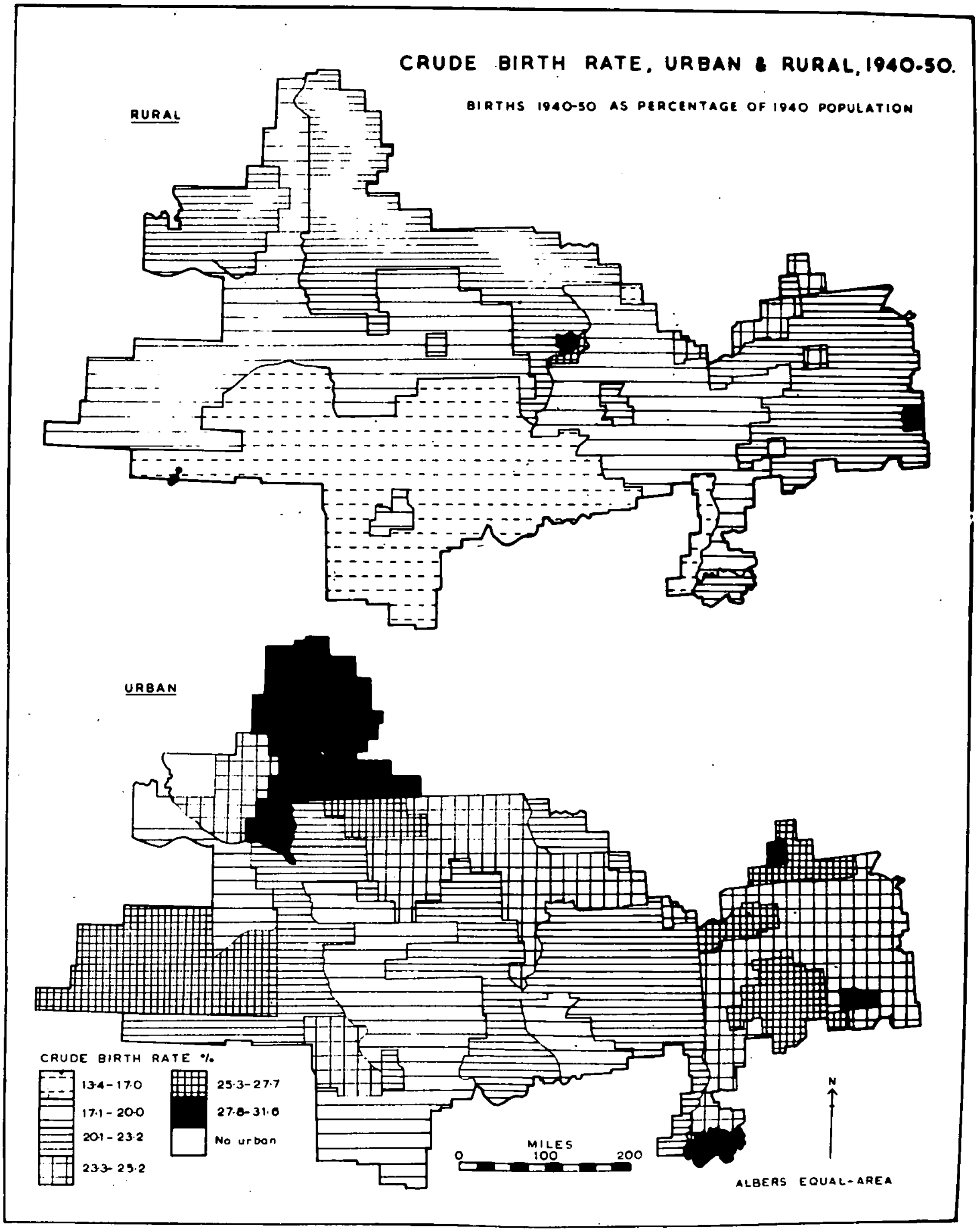
attributed to the increase in the birth rate. It should be realised that although rural out-migration had the effect of depreciating the numerical significance of births, and thus the crude birth rate, rural areas also experienced the increase in fertility during the decade 1940 - 1950 and in fact age and sex specific birth rates were as high in the rural areas as in the urban centres of the Corn Belt. Consequently, as was shown in the previous chapter (Vide Map 47), only in rural areas of very high out-migration did the migration rate exceed the rate of natural increase and constitute actual depopulation. In the case of rural areas which lost population by migration at intermediate or low rates and particularly in those areas which have been shown to have a low median age and a more balanced sex ratio, the rate of natural increase was quite high. This was apparently the case in the rural area of the Iowa-Minnesota border mentioned above as having a high rate of natural increase.

On the other hand, the rural areas with very low rates of natural increase in the Missouri and Kansas sections of the Southern Corn Belt with rates of under 5.5%, have experienced several decades of heavy loss of population and actual depopulation. Here the low rate of increase was obviously related to the decline in the proportion in the reproductive age groups, the very high sex ratio as a result of sex selective migration and also to the higher mortality rate as a result of the greater median age and proportion of elderly persons. (Vide Map 36).

The problem of differential urban and rural birth rates in the decade 1940 - 1950 is further examined in Map 55 which plots for State Economic Areas the crude birth rate of the urban and rural population.

From Map 55 it is apparent that urban crude birth rates were higher than rural throughout the Corn Belt and in only a few State Economic Areas did the rural even equal the urban value. Again the lowest rural crude birth rates are shown to have occurred in the areas of heaviest out-migration. The highest rural birth rates of from 20 - 23.2% were observed in two main circumstances. Firstly high rural crude birth rates occurred in areas where loss of rural population by migration was at a comparatively low rate, and especially this applied to the northern rather than southern sections. Secondly, rural crude birth rates were high in those areas of the Lower Great Lakes Region and East Central Lowland which were contiguous to large urban centres and where the rural non-farm element greatly exceeded the farm proportion. It has already been indicated that the rural non-farm age and sex composition was closer to the urban rather than rural farm pattern and that functionally a large proportion of the rural non-farm labour force was related to

MAP 55.



CRUDE BIRTH RATE, URBAN & RURAL, 1940-50.

BIRTHS 1940-50 AS PERCENTAGE OF 1940 POPULATION

RURAL
URBAN
CRUDE BIRTH RATE %
13·4 – 17·0
17·1 – 20·0
20·1 – 23·2
23·3 – 25·2
25·3 – 27·7
27·8 – 31·6
No urban
MILES
0
100
200
N
ALBERS EQUAL-AREA

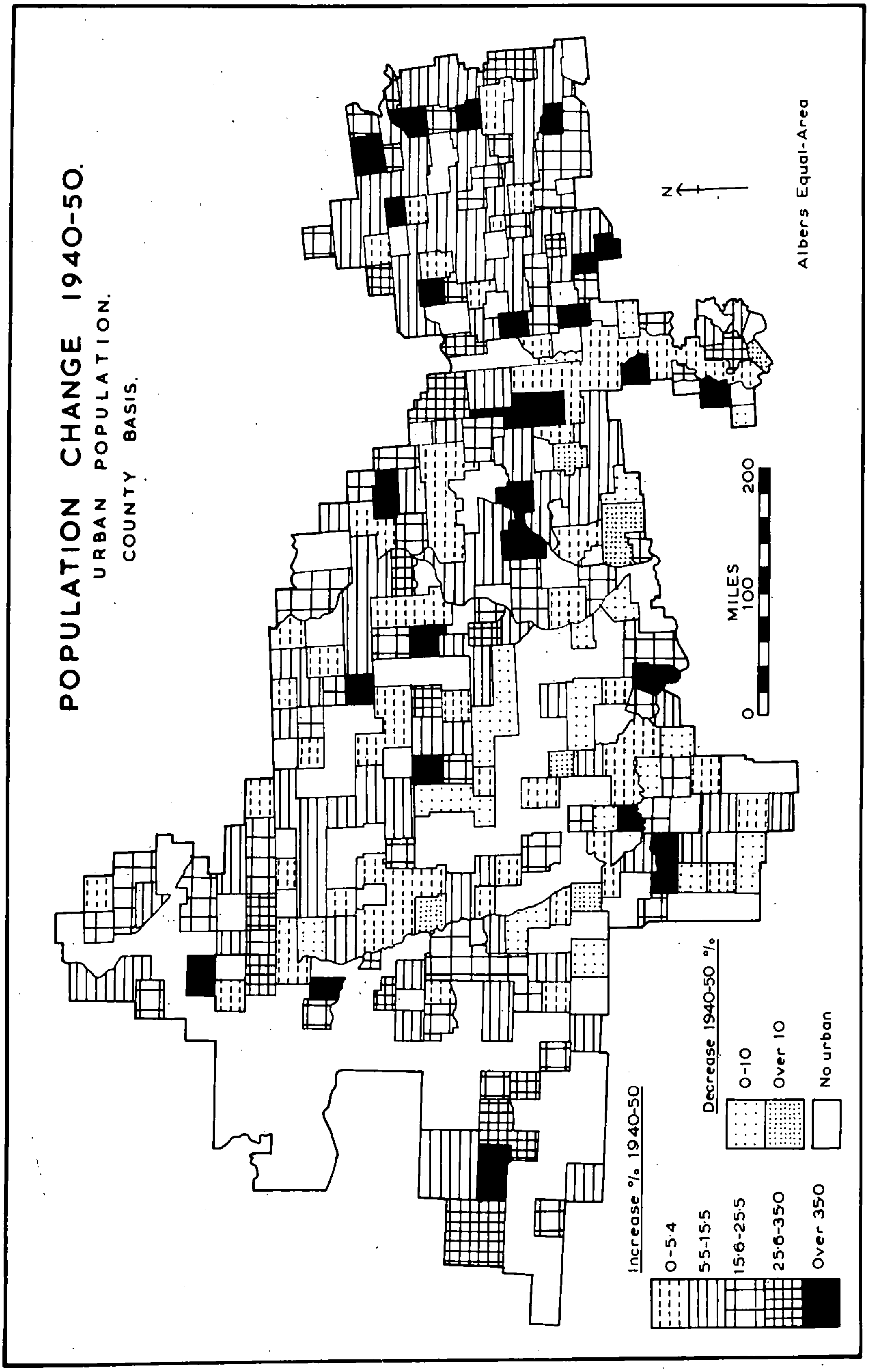
urban employment. It is also apparent that this affinity with urban demographic characteristics also extended to reproductive patterns.

The urban crude birth rate was universally very high; exclusively above 17.1% and predominantly above 20.1%. The highest rates occurred in the large metropolitan cities of Indiana, Michigan and Ohio, and especially those with large industrial labour forces. The latter category included a large proportion of in-migrants in the lower age groups. The high rates of Kentucky probably reflected the higher negro birth rate, while the very high rates of Minnesota and Nebraska represented a very small number of urban settlements rather than a common tendency throughout the large area involved.

Having described in some detail the components of population change in the decade 1940 - 1950 in the present and preceding chapters, it is now possible to summarise the detailed spatial pattern of population change that resulted.

Detailed Population Change, 1940 - 1950

The detailed features of population change between 1940 and 1950 are illustrated by Maps 56 - 58 on a county basis. Maps 56 and 57 indicate the detailed characteristics of population change for the rural and urban populations while Map 58 distinguishes between areas of increase and decrease.



POPULATION CHANGE 1940-50.

URBAN POPULATION.

COUNTY BASIS.

Increase % 1940-50
0-5·4
5·5-15·5
15·6-25·5
25·6-35·0
Over 35·0
Decrease 1940-50 %
0-10
Over 10
No urban
MILES
0
100
200
N
Albers Equal-Area

It is apparent from Map 56 that the major contrast in the characteristics of rural population change was between the eastern, and the central and western portions of the Corn Belt. This contrast was between an area embracing the Indiana, Ohio, Michigan and Northern Illinois sections which experienced an increase in rural population during the decade and virtually the whole of the Central and Western Corn Belt which lost rural population. Within this two-fold division further distinction can be made taking account of the rates of rural population change.

In the Eastern Corn Belt the increase in rural population may be attributed to the concentration in the non-farm sector, with its higher crude, though not specific, birth rate, and its gain by net migration compared with the net loss in the farm category. However, very high increases of over 10% were restricted to counties containing or adjacent to very large urban centres and reflected the concentration of rural non-farm population in close proximity to urban centres of employment and also the expansion of urban population into the rural-urban fringe and located within the census definition of rural territory though related functionally with the urban centre.

In the remainder of the Corn Belt rural population declined during the decade with the exception of isolated counties containing urban centres. However, a distinction must be made north and south of an axis extending approximately along the Mississippi-Des Moines-Upper Missouri Rivers separating a northern zone of intermediate rural population decrease of under 10% from a southern component where decreases of over 10% were almost universal. This contrast it has been already suggested represented differences in the volume of loss by migration and was considered in detail in Chapter 8.

The urban trend is illustrated by Map 57,[140] and is shown to have been almost exclusively one of increase at a very high rate. The highest rates of increase were experienced by the largest cities and the distribution of increases by over 35% coincided with that of the urbanised areas and largest cities. The relation of this growth to the influx of migration, and especially of young persons in the reproductive age groups has frequently been stressed. Some decline in urban population occurred in the central and southern Corn Belt and this involved particularly the very small towns and may again be attributed to migration, this time the out-migration to larger towns with greater employment opportunities.

The findings of Maps 56 and 57 have been compounded in Map 58 which differentiates between areas of increase and

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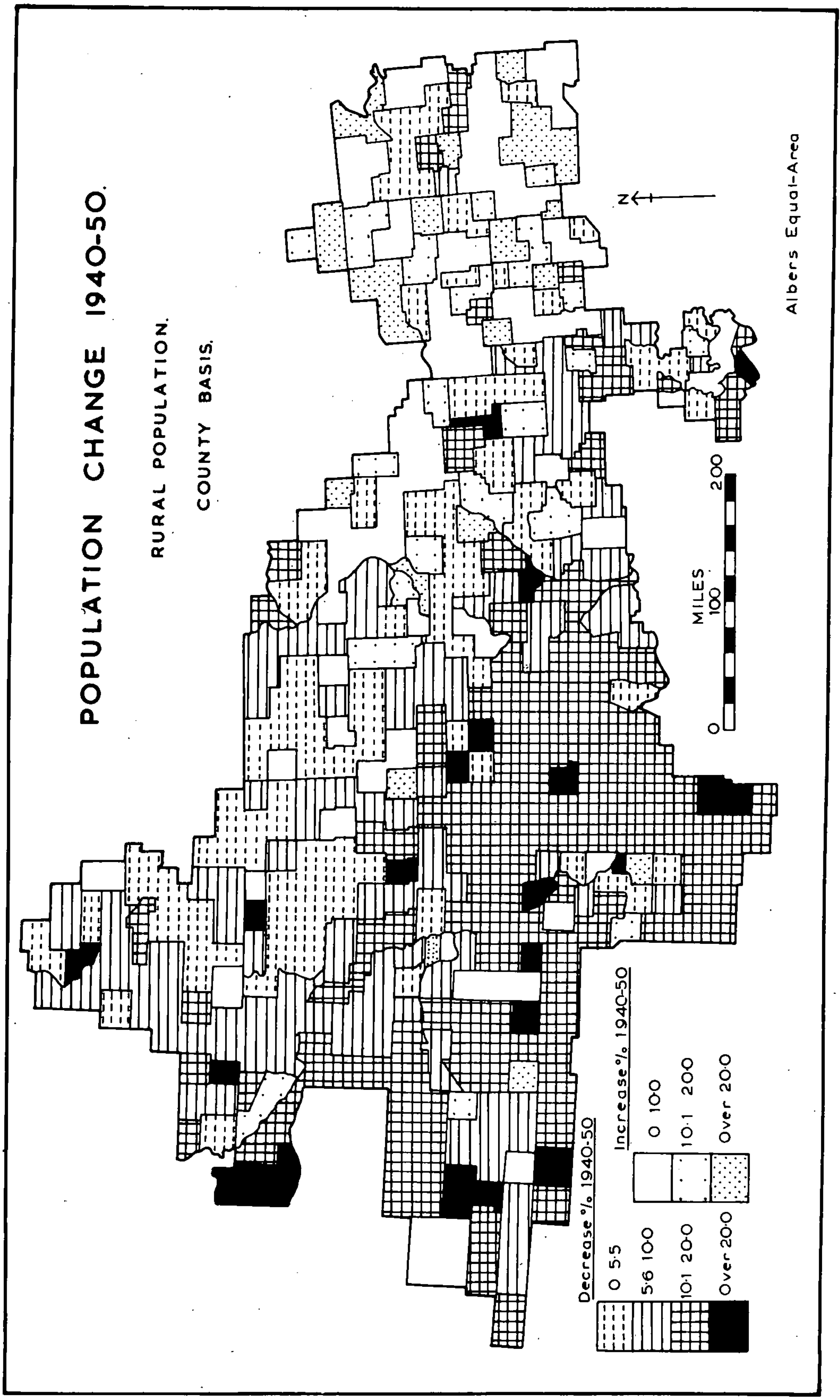
[140] In Map 57 the 1940 urban definition was used to facilitate comparison.

MAP 57.


POPULATION CHANGE 1940-50.
RURAL POPULATION.
COUNTY BASIS.
N
MILES
0
100
200
Albers Equal-Area
Decrease % 1940-50
0 5·5
5·6 10·0
10·1 20·0
Over 20·0
Increase % 1940-50
0 10·0
10·1 20·0
Over 20·0

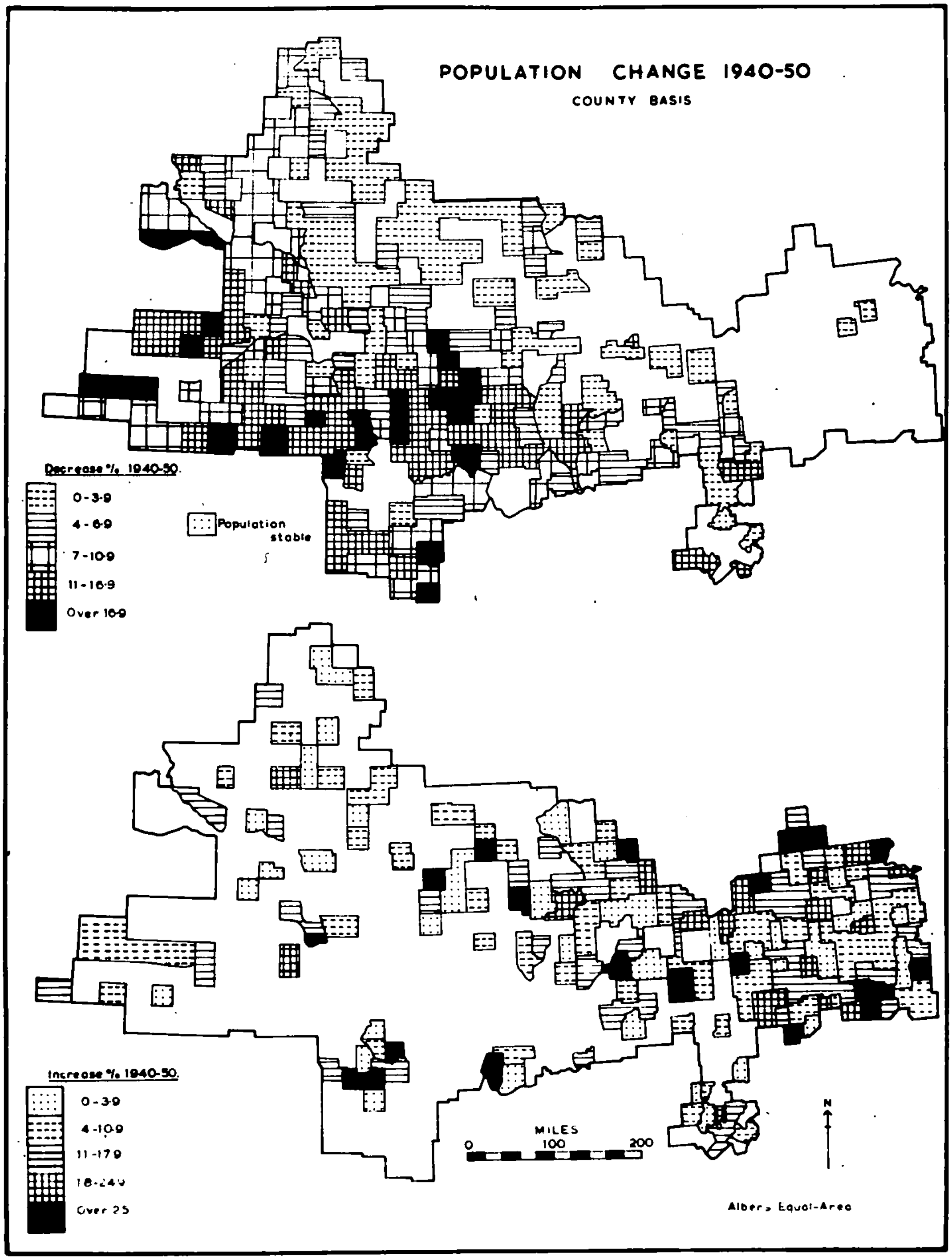
decline during the decade.

Map 58 offers impressive evidence of the rate at which the distribution of population in the Corn Belt has become increasingly concentrated in the eastern urbanised sectors as a result of both migration and the differential rural-urban rate of natural increase. Population increase is shown to be predominantly an urban phenomenon and involved especially the urban centres east of the Mississippi.

In fact the Central and Western Corn Belt, some two-thirds of its total area, lost population during the decade and in the case of the southern sector this was at a very high rate. Viewing this situation in the light of the experiences of previous decades 1940 - 1950 represented a return to the pre-depression trend of rural population loss and rapid urban growth at an intensified rate. Moreover it involved widespread rural depopulation in Missouri and Kansas in particular and produced metropolitan growth and expansion into the rural-urban fringe in the east rather than rapid expansion of all the urban centres throughout the Corn Belt.

The consequences of this trend, although beyond the present scope, are obviously cause for concern. The drift from rural areas has involved the younger, more progressive age groups, while the increasing concentration in the larger urban centres inevitably resulted in the

MAP 58.


POPULATION CHANGE 1940-50
COUNTY BASIS
Decrease % 1940-50.
0-3·9
4-6·9
7-10·9
11-16·9
Over 16·9
Population stable
Increase % 1940-50.
0-3·9
4-10·9
11-17·9
18-24·9
Over 25
MILES
0
100
200
N
Albers Equal-Area

expansion of the rural-urban fringe.

In fact as far as population growth was concerned by 1950 the wheel had come full circle. It was decribed in Chapter Three how in the initial peopling of the Corn Belt the movement was essentially westwards and involved a predominantly agricultural society which evolved the characteristic Corn Belt economy within a rural framework. By 1950 the movement of population and most rapid increase in population had been reversed and involved migration from rural residence eastwards to the industrial urban centres and implied a withdrawal from agriculture and effectively from direct relation to the Corn Belt agricultural economy.

This reversal of the direction of population movement and the increased concentration of population in the urbanised sections of the Corn Belt which has been the dominant trend of the twentieth century, and more especially of the decade 1940 - 1950 has been of great significance in determining the characteristics of the present population geography of the Corn Belt. In fact the thesis may be advanced that there now exist two distinct patterns of population distribution and density in the Corn Belt which to some degree are functionally unrelated.

The basic pattern of a fairly uniform rural population distribution and density closely related to the agricultural economy and which had evolved in essence by 1865 still remains in a modified form, but superimposed on this basic pattern of dispersed rural population and almost evenly spaced service centres is now a much more irregular urban distribution to some extent unrelated to the Corn Belt context of its setting.

It is the purpose of the final chapter to describe the detailed characteristics of the present distribution and density of population and especially its dual nature. The present pattern of distribution and density is described in relation to the demographic, social, economic and historical factors in its genesis and in this way brings together the major findings of previous chapters and summarises the work as a whole.

CHAPTER TEN

THE DETAILED DISTRIBUTION AND DENSITY OF POPULATION, 1950

CHAPTER TEN

THE DETAILED DISTRIBUTION AND DENSITY OF POPULATION, 1950

The pattern of population distribution and density in 1950 was essentially the end product of the events of the previous 150 years but more especially of the trends of the last half century. Previous chapters have indicated that the period 1790 - 1860 witnessed the settling of the Corn Belt and the establishment of a basic rural pattern. The period 1860 - 1900 was one of rapid population increase during which the first significant urban growth occurred. Finally, the period 1900 - 1950 was one of fluctuating trends but which fundamentally must be seen as a reversal of the earlier phases of growth with the dominant movement being eastwards towards the rapidly expanding urban centres. This movement reached a maximum in the decade 1940 - 1950 during which the rapid urban growth was further emphasised by the high urban rate of natural increase.

This evolution has been described in detail with particular emphasis on the initial settlement phase and on the latest stage of redistribution by internal migration since in these two instances least geographical work had been previously attempted. The result of this history of pioneer settlement, growth, and redistribution is that the present pattern of distribution and density is essentially a composite one. It is the purpose of this final chapter to describe this composite pattern of distribution and density in the light of the causative factors involved and which have been treated in various sections of the thesis. Before attempting to describe the composite structure of the distributional pattern it is first necessary to describe separately the individual distributions of the major residential components and assess their significance in the overall distribution and density.

1. URBAN POPULATION

The distribution of urban population has two distinct aspects. Firstly there is the total distribution, that is the spatial arrangement of urban centres classified according to town size, and secondly there is the relative distribution, that is the variation in the significance of the urban population in the total population throughout the Corn Belt. From a consideration of these two distributions it is possible to indicate:

1. The pattern of the distribution of urban centres in the Corn Belt and in particular the variations in town size and inter-urban distance.

2. Something may be indicated of the relationships of the pattern of distribution to contrasts in town size, town function and size of field of influence.

3. The spatial variation in the significance of the urban element in total population and thus the extent to which the distribution of towns is the chief determinant of overall population density.

In 1950 the total urban population of the Corn Belt was 8,716,650 persons of which figure 80.6% was resident in 264 towns of over 5,000 inhabitants. Further details of the composition of the urban population by town size are given in Table 78 below.

TABLE 78

THE COMPOSITION OF THE URBAN POPULATION OF THE CORN BELT IN 1950, BY TOWN SIZE

TOWN SIZE	NUMBER OF TOWNS	TOTAL POPULATION	% OF TOTAL URBAN POPULATION
Over 180,000	6	2,054,201	23.6
100 - 180,000	6	797,528	9.2
50 - 100,000	19	1,314,191	15.0
25 - 50,000	28	953,724	10.4
12 - 25,000	66	1,058,307	12.0
5 - 12,000	139	947,717	10.4
2.5 - 5,000	-	1,581,234	19.4
TOTAL		8,716,650	100.0

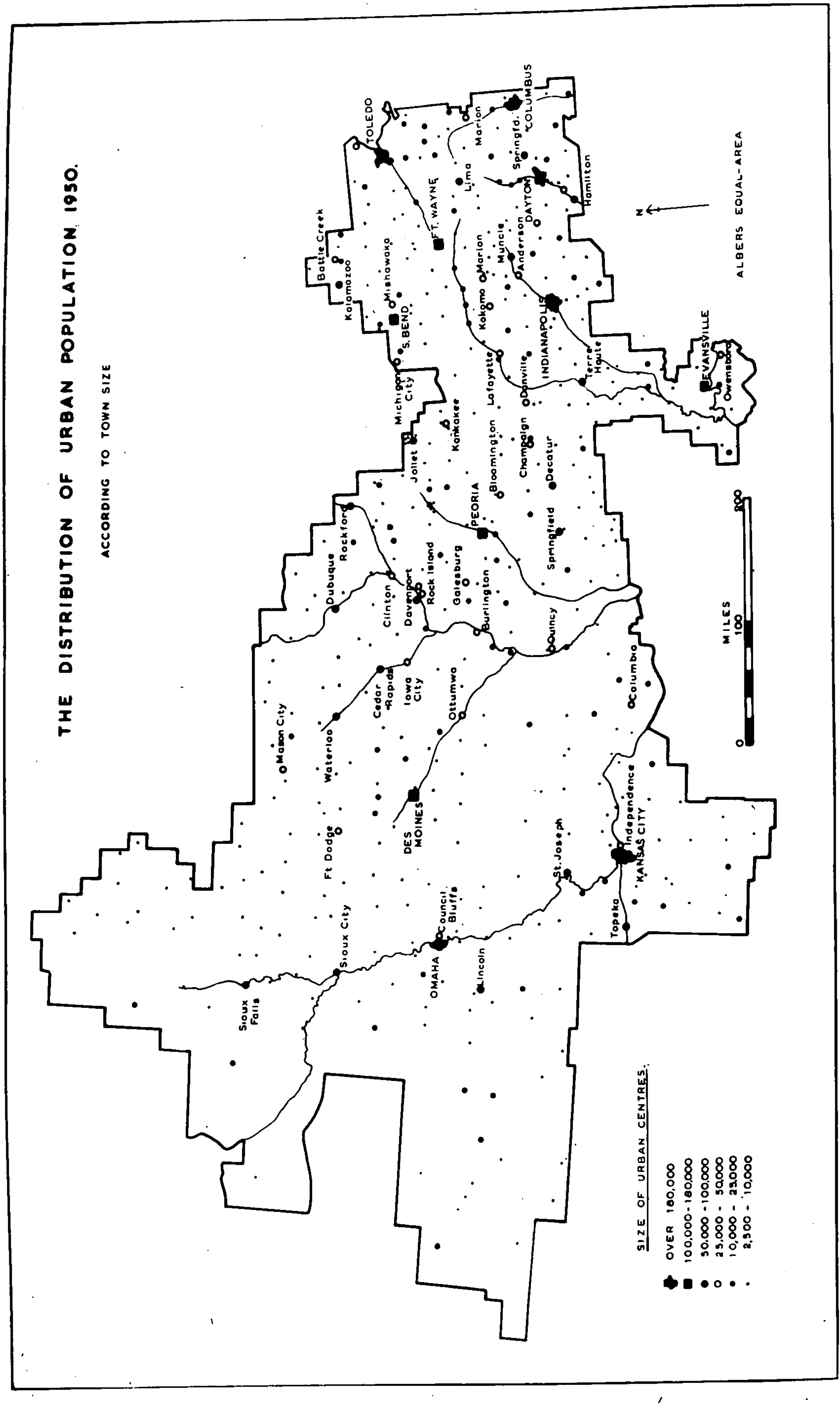
Source: U.S. Bureau of the Census, Census of Population, 1950, Vol.ii. Characteristics of the Population, Table 7

From Table 78 it is apparent that in 1950 numerically speaking the Corn Belt was an area of small towns. Of the 264 towns of more than 5,000 inhabitants more than half were in the range of from 5,000 to 12,000 and almost 75% were less than 25,000 in size. However in terms of the total urban population only 41% of the total resided in towns of less than 25,000 inhabitants despite their high numerical proportion while almost a quarter of the Corn Belt urban population resided in its six largest cities.

The distribution of all the urban places of the Corn Belt is shown in Map 59 classified by size of urban centre.

From Map 59 the most obvious pattern of distribution was the almost regular distribution of small towns of from 2,500 to 10,000 inhabitants though with a marked increase in dispersion westwards and southwards from the Mississippi Valley. This distribution represents the characteristic small town of the Corn Belt, the minor service centre serving a primarily agricultural service area. Superimposed on this distribution of small towns was a more dispersed and less regular pattern of larger towns in the range 10,000 to 25,000 inhabitants. These represented higher order service centres serving a wider area and frequently having specialised additional functions as for instance transport or educational centres or possessing light industries.

This pattern that has been described is seen from Map 59 to be the basic urban distribution of the Corn Belt and



THE DISTRIBUTION OF URBAN POPULATION 1950.

ACCORDING TO TOWN SIZE

SIZE OF URBAN CENTRES.
✚ OVER 180,000
■ 100,000 - 180,000
● 50,000 - 100,000
○ 25,000 - 50,000
• 10,000 - 25,000
· 2,500 - 10,000
MILES
0
100
200
N
ALBERS EQUAL-AREA
TOLEDO
COLUMBUS
Marion
Springfd.
Lima
DAYTON
Hamilton
FT. WAYNE
Muncie
Anderson
Marion
Kokomo
INDIANAPOLIS
Battle Creek
Kalamazoo
Mishawaka
S. BEND
Michigan City
Lafayette
Danville
Terre Haute
EVANSVILLE
Owensboro
Kankakee
Joliet
Bloomington
Champaign
Decatur
PEORIA
Springfield
Rockford
Dubuque
Clinton
Davenport
Rock Island
Galesburg
Burlington
Quincy
Columbia
Cedar Rapids
Iowa City
Ottumwa
Mason City
Waterloo
Ft Dodge
DES MOINES
Independence
KANSAS CITY
St. Joseph
Topeka
Council Bluffs
OMAHA
Lincoln
Sioux City
Sioux Falls

one in which there is a high degree of spatial uniformity. This tendency towards a uniformity in inter-urban distance in relation to town size, variation in rural population density and size of service area has attracted much attention from research workers for in the intimate and complex relationship between the smaller service centres and their tributary service areas lies the germ of the Corn Belt economy. A close relationship between the agricultural economy, rural population density and the size and spacing of urban centres is obviously implicit but the detailed nature of this relationship and the degree of spatial consistency has yet to be described over a large area.[141] Stewart emphasises the need for caution in generalisation concerning these town-country relationships especially as exactly the same spatial pattern of rural density and inter-urban distance of service centres may arise from completely different conditions.[142] It is the Writer's view that even in the case of the small service centres considerable variety of socio-economic circumstances exist and that individual research is necessary to establish functional relationships. In the case of the Central and Western Corn Belt the added complication of rural depopulation is relevant and confuses

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141. For a discussion of rural service centres within the Corn Belt, Vide Brush, J.E. "The Hierarchy of Central Places in Southwestern Wisconsin". Geographical Review, XLIII, 1953

142. Stewart, Q.J.Jr. "The Size and Spacing of Cities". Geographical Review, Vol. XLVIII, No.2. 1958.

any static concept of rural-urban relationships or strict relationship of type of agriculture to size and spacing of urban centres. It is considered sufficient in the present study to indicate that the distribution of the smaller towns of the Corn Belt is a reflection of their function as service centres of varying order in rural areas. The exact determinants of their size and spacing may be varied and often highly specialised. In particular these relationships must be dynamic rather than static and therefore each service centre should be examined in its individual circumstances.[143]

The basic pattern described above had some measure of uniformity and consistency in the Corn Belt though with an obvious variation related to overall population density. Superimposed on this pattern of small towns was a much more irregular and complex distribution of larger urban centres of which the size, function and inter-urban distance were not entirely related to their location in the Corn Belt.

In the case of these larger cities some further differentiation may be made on the basis of their size and functions. It was notable that the very large regional centres with more than 180,000 inhabitants in 1950 had essentially a peripheral distribution. This involved Kansas City, Omaha, Indianapolis, Dayton, Columbus and Toledo all located outside the heart of the Corn Belt. This peripheral

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143. For a detailed account of theories of urban location, centrality and inter-urban distance, Vide Mayer, H.M. and Kohn, C.F. Editors. "Readings in Urban Geography" Sections 7 & 8, University of Chicago Press, 1959.

distribution of the large cities is strengthened by the location of six other large cities peripheral to the Corn Belt but just outside the area as defined in 1950. They were, Chicago, St. Louis, Cincinnati, Detroit, Louisville, and Minneapolis - St. Paul. This distribution of the largest cities on the fringe of the Corn Belt in part accounts for thegreat regional significance of several much smaller cities in the heart of the Corn Belt.

The six cities with from 100,000 to 180,000 inhabitants fell into two groups in terms of function and distribution. Des Moines, Rock Island - Davenport - Moline, and Peoria were the major regional centres of the Central Corn Belt, while Evansville, Fort Wayne and South Bend had a peripheral location and were more specifically industrial centres.

The intermediate size cities of from 50,000 to 100,000 also fell into two groups in general. Those west of the Mississippi were minor regional centres located at nodal points with respect to their functions as collecting and distributing centres for wide areas of the Western and Central Corn Belt. Sioux Falls, Cedar Rapids, Sioux City, Lincoln and Topeka came in this category. East of the Mississippi most of the intermediate sized towns had significant industries and their distribution comprised the three industrial zones of the Eastern Corn Belt described in Chapter Six. The three industrial zones of the Lower Great Lakes, Central Indiana and the Miami Valley of Ohio contained some 20 industrial centres with populations of from 25,000 to 100,000. The distribution and size of these urban centres was obviously a reflection of their industrial functions.

The most consistent factor of actual location of the larger cities of the Corn Belt is the relationship between the major urban centres and the principal rivers. In particular the large cities of the Corn Belt were located almost exclusively on the Ohio and its tributaries the Wabash, White, Miami and Scioto, the Mississippi and its tributaries the Illinois, Des Moines, Rock and Cedar rivers and the Missouri and its tributaries the Kansas, Platte and Sioux rivers. The historical and geographical factors of the selection of river sites for urban centres in the Middle West have been reviewed by Burghardt.[144] The essential factor has been that large cities have developed at points most favourable for commerce and industry and in particular the crossing points over navigable rivers of themajor routes involved in the development and extension of the Middle West westwards enjoyed certain advantages in this respect. In the Eastern Corn Belt with the completion of the settlement and improvement of communications nodality had alesser influence in urban growth than the development of industries while in the Western Corn Belt those urban centres on the Missouri and Mississippi with the greatest nodality developed as collecting, break of bulk and distribution centres for the new lands.

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[144] Burghardt, A.F. "The Location of River Towns in the Central Lowland of the United States". Annals of the Association of American Geographers, Vol.49. No.3. 1959.

In relation to the larger cities of the Corn Belt account should be taken of the composite functional and geographical structure of the built-up area. In the initial chapter attention was drawn to the distribution between the central city and the densely settled urban fringe as recognised by the census. Much research has been published on the internal structure of American cities but for the sake of completeness Table in the Appendix indicates the differential distribution of population between the central city and urban fringe in the instance of the urbanised areas of the Corn Belt in 1950. In the case of the largest cities from 20 to 30% of the total population was located in the urban fringe and it was noted in Chapter Nine[145] that the rate of growth by migration was much greater in the case of the urban fringe than the central cities.

Finally a brief consideration of the relative distribution of the urban population of the Corn Belt adds further information on the significance of the urban centres in the total population distribution and density of the Corn Belt.

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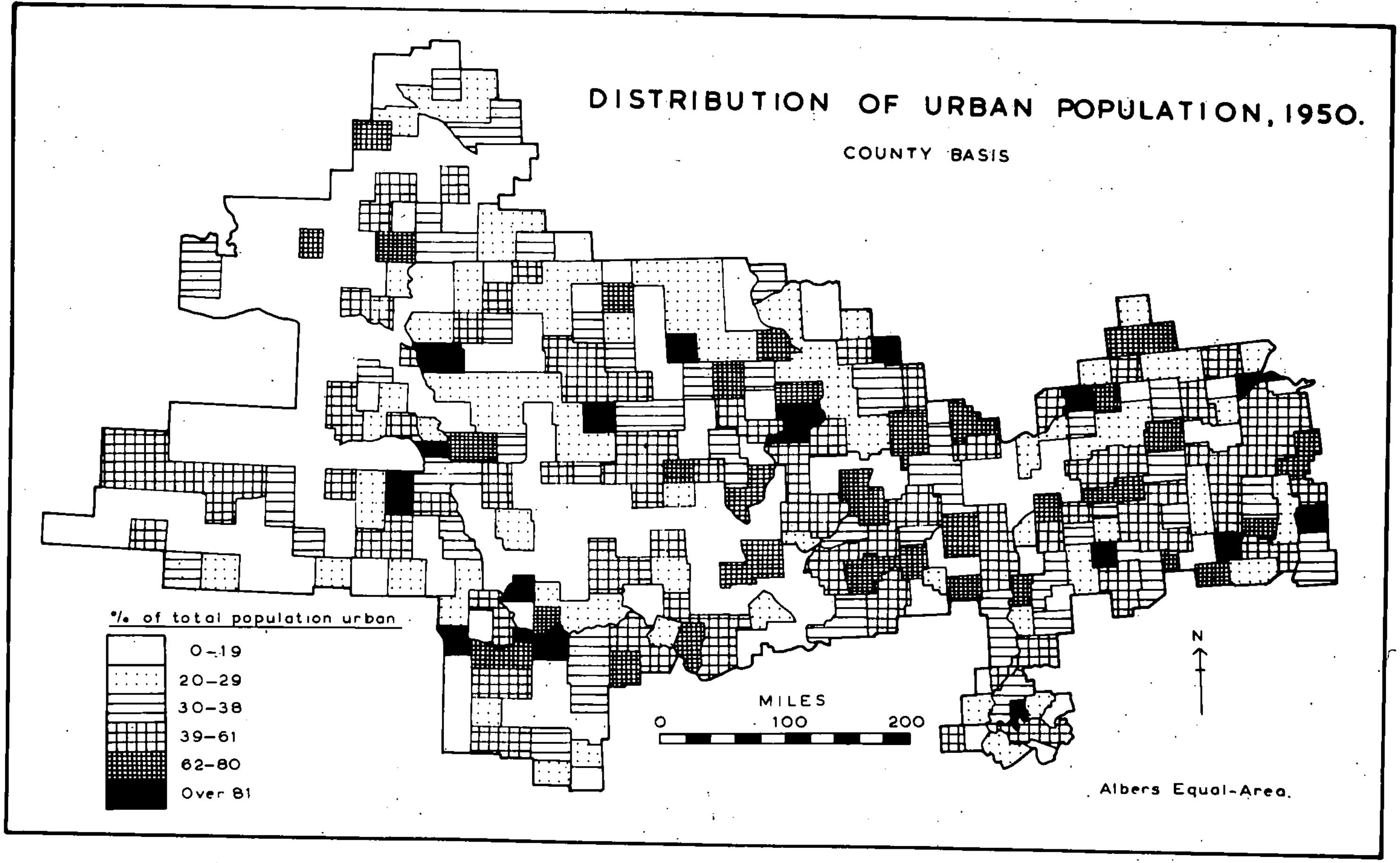
[145] Vide Chapter Nine, "The Growth of Population, 1900 - 1950"

The relative distribution of urban population is indicated in detail in Map 60. The pattern of relative distribution closely reflected the absolute distribution described above. The urban proportion exceeded 20% of the total population in almost all the counties of the Corn Belt with the exception of two major areas of very low overall population density. These were the western section of the Upper Missouri Valley and the Iowa-Missouri border of the West Central Lowland. It is apparent from the map that these two areas were the most rural and least urban of the Corn Belt in 1950. At the other extreme Map 60 indicates that the counties with over 80% of their total population in urban residence coincided exactly with the distribution of the urbanised areas. In between these two extremes there was considerable spatial variation in the significance of the urban element. Although the urban element represented 54.5% of the total population of the Corn Belt in 1950, this is shown to be chiefly a function of some 30 large cities while the majority of the Corn Belt had less than 40% of its population in urban residence and in at least half of the Corn Belt area the urban proportion of total population was less than 30%.

MAP 60.


DISTRIBUTION OF URBAN POPULATION, 1950.
COUNTY BASIS
% of total population urban
0–19
20–29
30–38
39–61
62–80
Over 81
MILES
0
100
200
N
Albers Equal-Area.

Summary and Conclusions on Urban Distribution

1. In 1950 54.5% of the Corn Belt population resided in towns of over 2,500 inhabitants and of this 80.6% resided in 264 towns of over 5,000 inhabitants.

2. Numerically the Corn Belt was an area of small towns but in terms of total population the 31 cities of over 50,000 inhabitants contained 41.7% of the total urban population.

3. Distinction has been made between a fairly uniform pattern of small towns, rural service centres of less than 10,000 inhabitants distributed with a tendency towards regularity throughout the Corn Belt, and superimposed on this pattern an irregular distribution of larger cities with more complex functions and in which industry was frequently significant, and which owed its genesis to urban growth and redistribution of rural population after 1900.

4. The very large metropolitan cities of the Corn Belt had a peripheral distribution with spheres of influence extending outside the Corn Belt, while marginal but just outside the Corn Belt were other large cities whose spheres of influence intruded into the Corn Belt and affected demographic characteristics within the Belt. The smaller regional capitals were located in the heart of the Corn Belt serving the central predominantly rural areas outside the sphere of influence of the peripheral metropolitan cities and west of

the industrial zones of the Eastern Corn Belt.

5. There was evidence in the spatial arrangement of the smaller urban centres, according to town size, of hierarchy in terms of function, size of urban field and inter-urban distance. The chief determinants appeared to be the characteristics of the agriculture and the rural population density but individual detailed study is necessary to indicate the mechanism of these urban-rural relationships.

6. Only three significant concentrations of urban centres existed in 1950, in the Lower Great Lakes, Central Indiana and Miami Valley coinciding with the distribution of manufacturing. These three concentrations accounted for the major contrasts in urban distribution in the Corn Belt. However although the absolute concentration of urban population was in the east the relative significance had a more uniform distribution.

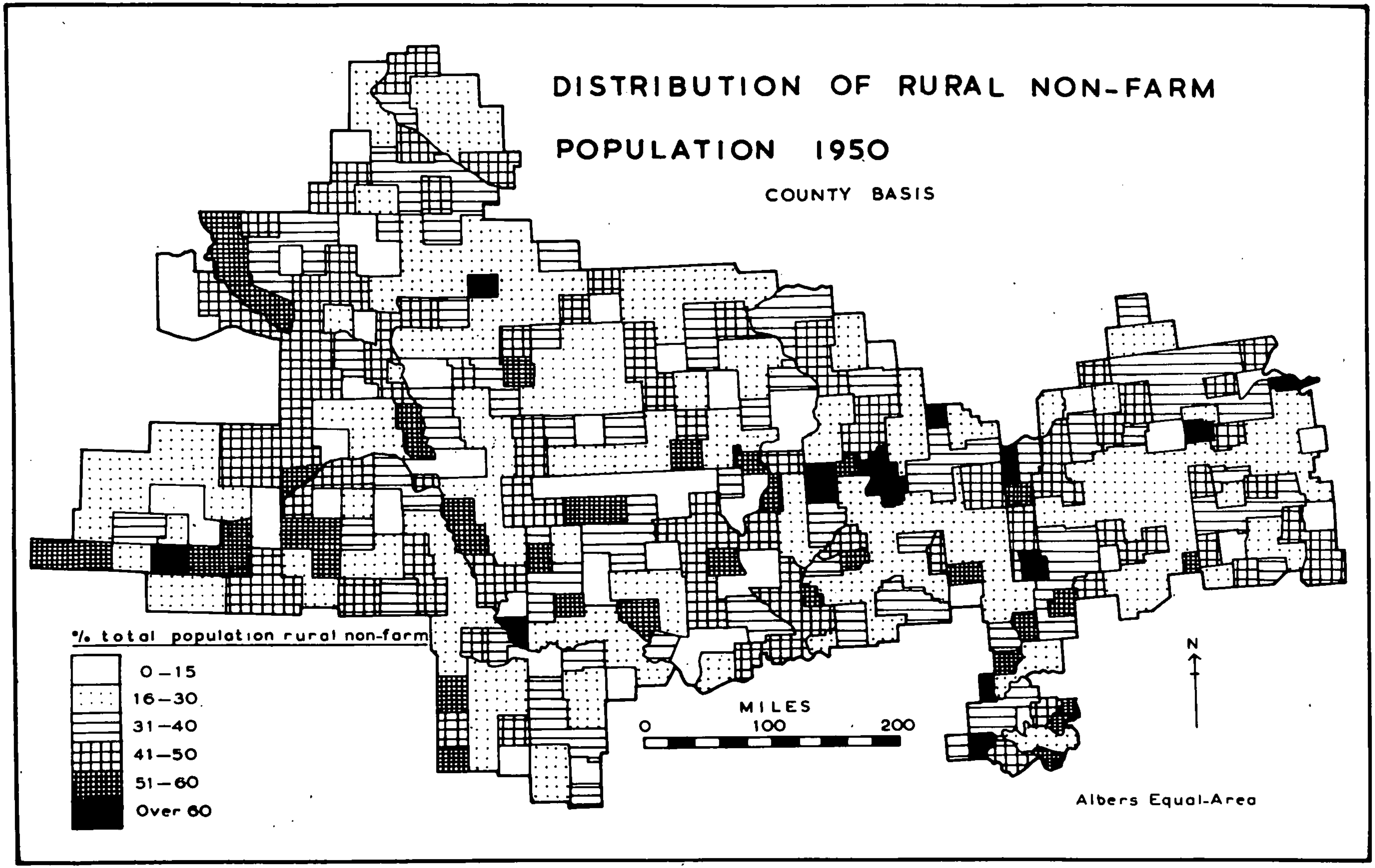
It had been shown that in numerous instances the rural non-farm element is closely related to the urban in both function and demographic characteristics. The distribution of rural non-farm population may now be considered.

2. DISTRIBUTION AND DENSITY OF RURAL POPULATION

Rural Non-Farm population

The relative distribution of rural non-farm population is indicated on a county basis by Map 61. This map indicates

MAP 61.



DISTRIBUTION OF RURAL NON-FARM POPULATION 1950

COUNTY BASIS

% total population rural non-farm
0 – 15
16 – 30
31 – 40
41 – 50
51 – 60
Over 60
MILES
0
100
200
N
Albers Equal-Area

that in 1950 the significance of the rural non-farm element over the majority of the Corn Belt was from 16 - 30% of the total population of each county. A higher proportion of over 40% occurred in two main circumstances; in counties containing or adjacent to the largest urban centres and in rural areas of low total population density, few towns and extensive agricultural land use.

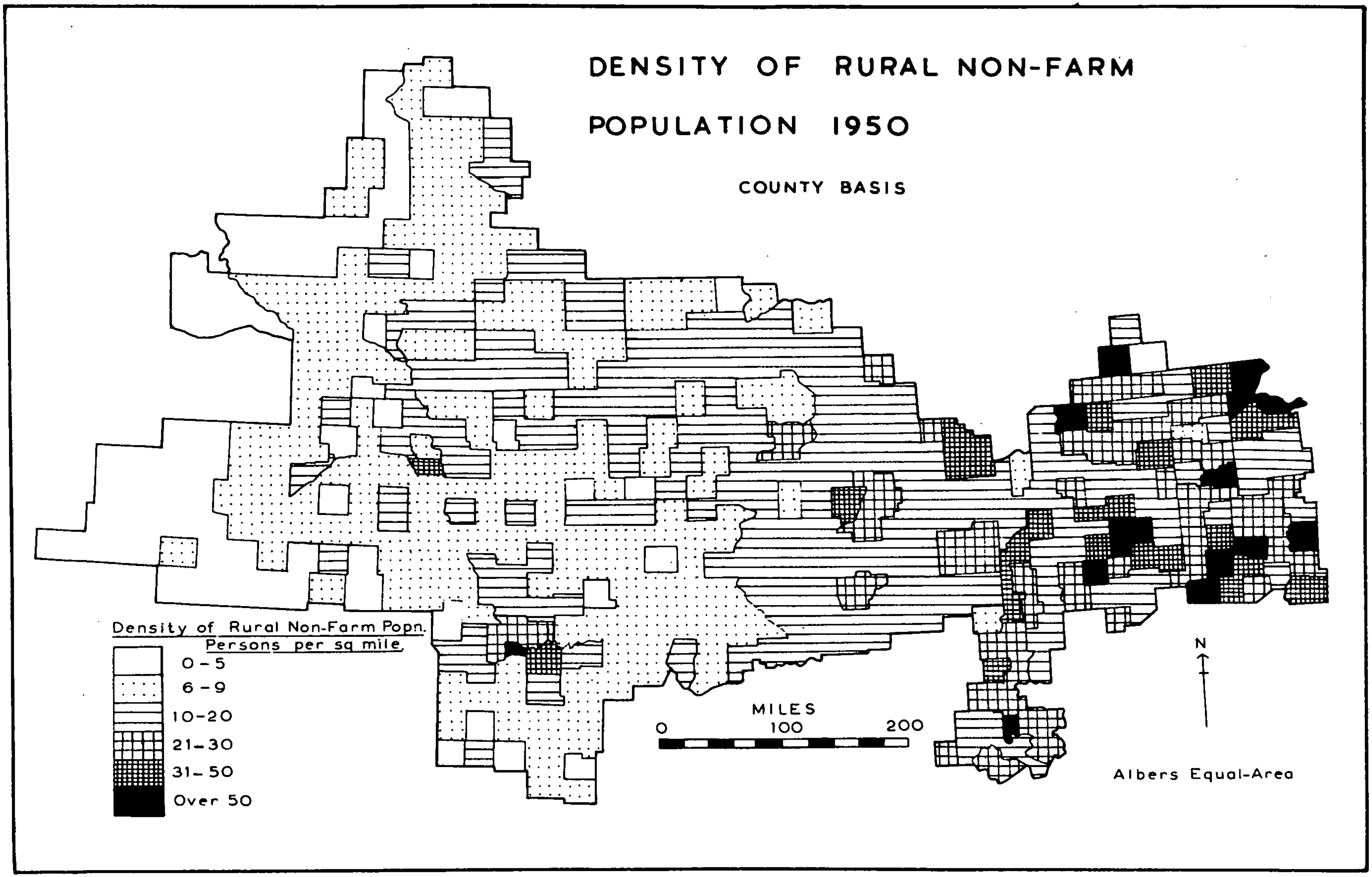
The association of high rural non-farm proportions with proximity to large urban centres was by no means universal but there was a consistently high rural non-farm proportion in counties adjacent to the large industrial centres of Central Indiana, the Miami Valley and more especially in the case of the Lower Great Lakes. Moreover it was shown in the preceding chapter that these counties adjacent to urban centres had a very high rate of growth.

In the case of the high proportion of rural non-farm in the rural areas of the Central and Western Corn Belt the chief determinant was the absence of towns which increased the total rural proportion both farm and non-farm. The high proportion in the western Upper Missouri Valley coincided with an area of large farms and extensive agricultural economy in which the rural farm element was correspondingly smaller than in areas of more intensive agriculture and family farm units. Moreover the high proportions of over 40% in the Upper Missouri Valley and South Central Corn Belt coincided with areas of rural depopulation which has been shown to involve rural farm particularly and consequently increased the significance of the non-farm element. However the chief factor in the significance of rural non-farm was the dependence of the farm operator on hired labour, of non-farm residence, in view of the increased farm size.

Map 62 indicated the detailed variation in the density of rural non-farm to add absolute values to the relative distribution described above. Map 62 indicates that in absolute terms the rural non-farm population of the Corn Belt in 1950 was concentrated overwhelmingly in the counties containing and adjacent to the large regional and industrial centres of the Eastern Corn Belt delimited by the densities of over 31 persons per square mile. West of this essentially eastern concentration the only counties with an equivalent density were those containing Peoria, Rock Island,- Moline - Davenport, Omaha and Kansas City.

The density of rural non-farm population outside these high density zones already indicated was contrasted east and west of an axis running approximately along the Mississippi and Des Moines Rivers. East of this axis was an area with a uniform density of 10 - 20 persons per square mile with higher densities occurring only in the counties containing Peoria, Springfield, Rockford, and Rock Island - Moline - Davenport. This density coincided with an area

MAP 62.



DENSITY OF RURAL NON-FARM POPULATION 1950

COUNTY BASIS

Density of Rural Non-Farm Popn.
Persons per sq mile
0 – 5
6 – 9
10–20
21–30
31–50
Over 50
MILES
0
100
200
N
Albers Equal-Area

of overall uniform population density and a regular distribution of minor service centres. It has already been indicated in Chapter Six that in this region the rural non-farm labour force was employed primarily in urban functions rather than agriculture involving employment in the minor service centres or commuting to the larger towns offering industrial employment.

West of the Mississippi - Des Moines Rivers the density of rural non-farm population fell below 10 per square mile reflecting an overall decrease in total population density and a decrease in the number of towns and the consequent concentration of regional service functions in the larger more widely dispersed cities. The lack of a variety in economic functions and infra-structure that is found in the Western Corn Belt accounted for the low density of rural non-farm population.

Summary of the Distributional Characteristics of the Rural Non-Farm Population, 1950

1. In the majority of the Corn Belt Counties the rural non-farm element constituted between 16 and 30% of the total population.

2. Higher relative concentrations occurred in counties containing or adjacent to large industrial centres or large regional service centres where employment opportunities existed within easy commuting range.

3. Higher relative concentrations also occurred in areas of extensive land use and large farms; mechanised agriculture with concentration on cattle rearing and cash grain production where the labour requirements could not be met by a single farm family. This applied especially to the western fringe of the Corn Belt. Conversely, lower concentrations of rural non-farm occurred in the heart of the Corn Belt where the system of agriculture involved family farm units and where large urban centres are more widely distributed than in the eastern margin.

4. In terms of the absolute distribution as revealed by a density map, the rural non-farm population was shown to be concentrated overwhelmingly in the Eastern Corn Belt and particularly was localised in the counties adjacent to the three industrial zones of the Lower Great Lakes, Central Indiana, and Western Ohio.

5. There was a strong tendency for the rural non-farm element to vary directly in significance with the degree of variety in economic activity and the economic infra-structure. Consequently the greatest concentrations were spatially coincident with the urban centres of secondary and tertiary employment opportunities while in the purely agricultural areas, especially where agriculture was based on intermediate sized family farm units, the absolute and relative significance of rural non-farm population was much reduced. This suggests that a distinction

must be made in the rural non-farm component between a smaller proportion occupied in agriculture and rural services, especially in the small rural service centres, related functionally to the basic Corn Belt rural economy, and, secondly, a much larger proportion located chiefly in the Eastern Corn Belt related functionally to urban activities and not directly to the rural setting in which they resided.

3. RURAL FARM POPULATION

In the case of urban population the factors involved in distribution and significance are well understood and involved factors of location and actual function. Similarly in the case of the rural non-farm element a fairly clear pattern emerged though with more complexity due to the contrasts in function. However in the case of the rural farm element a much greater number of variables influencing distribution and density are significant since a much closer relationship exists between settlement and environmental and economic conditions when production is directly dependent on the land. Consequently, before a specific examination is attempted it is necessary to summarise the major factors influencing distribution and density.

An earlier map, Map 32, showing the density of population engaged in agriculture per square mile of cropland indicated a remarkable degree of uniformity in the density of agricultural population throughout the Corn Belt despite contrasts in farming type. The heart[146] of the Corn Belt was shown to have a uniform density of from 5 to 7.9 persons per square mile of cropland engaged in agriculture, while the major contrasts occurred in the fringe areas. This contrast between the heart regions and the periphery is fundamental in rural population matters in the Corn Belt and reflects contrasts in the type of farming.[147]

A similar degree of uniformity will be shown to exist in the distribution and density of rural farm population and it is suggested that this regularity arises from two main circumstances. Firstly the system of family farm units especially in the heart of the Corn Belt, and secondly the effect of the rectangular land survey system which produced consolidated farm units with evenly-spaced homesteads in a pattern which subsequent changes in farm size and type of farming have not entirely obliterated.

The system of family farm units characterises the heart of the Corn Belt and despite the increase in out-migration of young farm residents this remains an important factor in rural farm population distribution and density. The agricultural system is based on a combination of cropping and concentrated feeding together with subsidiary interests chiefly dairy and poultry, which vary in significance regionally in a system which provides employment for all the adult family at all seasons on a holding of 200 acres or less. Moreover little additional hired labour of non-farm residence is required. In theory, therefore, the average size of farm multiplied by the average size of farm family would give an approximation to the actual rural farm density throughout large areas of the heart of the Corn Belt.

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[146] The "heart" of the Corn Belt consisted of the type of farming regions:- Cattle Feeding and Hogs; Cash Corn, Oats and Soybeans and Hogs and Soft Winter Wheat.

[147] For a theoretical approach to these relationships in terms of space structure vide Garrison, W. and Marble, D.F. "The Spatial Structure of Agricultural Activities", Annals of the Association of American Geographers, Vol.47. 1957.

Secondly, the rectangular land survey system which introduced the purchase of lands by units of quarter sections of 160 acres, frequently subdivided into farms of 80 acres, resulted in a tendency towards a dispersed rural settlement pattern and one in which a considerable degree of regularity existed. The Homestead Act of 186~~7~~2 had increased the size of the available farm unit by the time thefrontier had reached Central Iowa at a time when machinery facilitated the farming of larger units in an environment which required more extensive land use and in which no obstacle existed in the form of forest cover to restrict the size of holding capable of being improved by one owner. The result was that although the size of farm increased and rural population density was correspondingly reduced, the same uniformity of population distribution and density on consolidated holdings was maintained.

The trend since 1900, and especially since 1930 has been for an increase in farm size and a reduction in the number of farm holders, particularly in the Western Corn Belt. Although loss of rural population by migration has resulted in a decrease in density, it has not effected any change in the tendency towards a uniform distribution of population and a regularity in density inherited from the settlement under the rectangular survey system.

It has been suggested that the dominant characteristic of rural farm population distribution is the uniformity over large areas, especially in the heart of the Corn Belt, and contrasts between the heart regions and the periphery. Local contrasts in distributional characteristics are the exception rather than the rule and rather one should point to the regional contrasts with a high degree of uniformity within the regions. It may be suggested that the contrasts in rural farm population between the heart and the peripheral regions basically reflect changes in the type of farming as it affects characteristics of employment. These contrasts involved the western, north-eastern and southern peripheries, which in 1950 had markedly different patterns of rural farm population distribution and density from that of the heart of the Corn Belt.

A. THE WESTERN PERIPHERY (LIVESTOCK AND CASH GRAIN)

In the case of the western periphery the decrease in farm population density was directly related to the increased farm size imposed by the lower rainfall conditions and the necessity for extensive methods of land use. The average farm size in the Livestock and Cash Grain region exceeded 300 acres, and commonly, in the extreme west, exceeded 600 acres. This was achieved by a high capital input in mechanisation and a reliance on hired labour in the non-farm residential group. The family farm unit is not an economic possibility and the occupation of rural - non-farm residents in agriculture had the effect of reducing the relative significance of the rural farm element in the total population while the increased farm size had the effect of reducing the density of rural farm population to the lowest figure in the entire Corn Belt.

B. THE NORTH EASTERN PERIPHERY (LIVESTOCK AND PASTURE, LIVESTOCK AND DAIRY, DAIRY, SOYBEANS AND CASH GRAIN)

The contrast between the heart of the Corn Belt and the North Eastern fringe in rural farm population characteristics is as marked as in the case of the western periphery, though the basis of the contrast is the opposite extreme. The chief contrast is the decrease in farm size to under 125 acres, the smallest average size of holding in the Corn Belt. This reduction in size was related to the high quality of the land resulting in a favourable cropping combination giving high per acre returns. The proximity to urban centres has encouraged a concentration on whole milk and dairy production which produces good returns from comparatively small farm units. The greater density of farm population also reflected the increase in employment opportunities made available by the proximity of urban centres within commuting range. This had a double implication in that it accounted for a reduction in the amount of loss by migration and also facilitated a high proportion of part-time farming by farm operators.[148]

C. THE SOUTHERN PERIPHERY (LIVESTOCK AND PASTURE, LIVESTOCK CASH GRAIN AND DAIRY)

The chief characteristics of rural farm population distinguishing this peripheral area from the heart of the Corn Belt is the scale on which rural depopulation has resulted in a reduction of rural farm population density to a level comparable with that of the western periphery. Again a relationship with the type of farming may be suggested in that this southern margin represents the transition to the general farming of the poorer soils of the Ozark province. A deterioration in soil conditions results in lower yields and a scarcity of good cropland. Livestock are essential to maintain the quality of the soil and to utilise the hay and pasture. The result of the poorer quality of the environment

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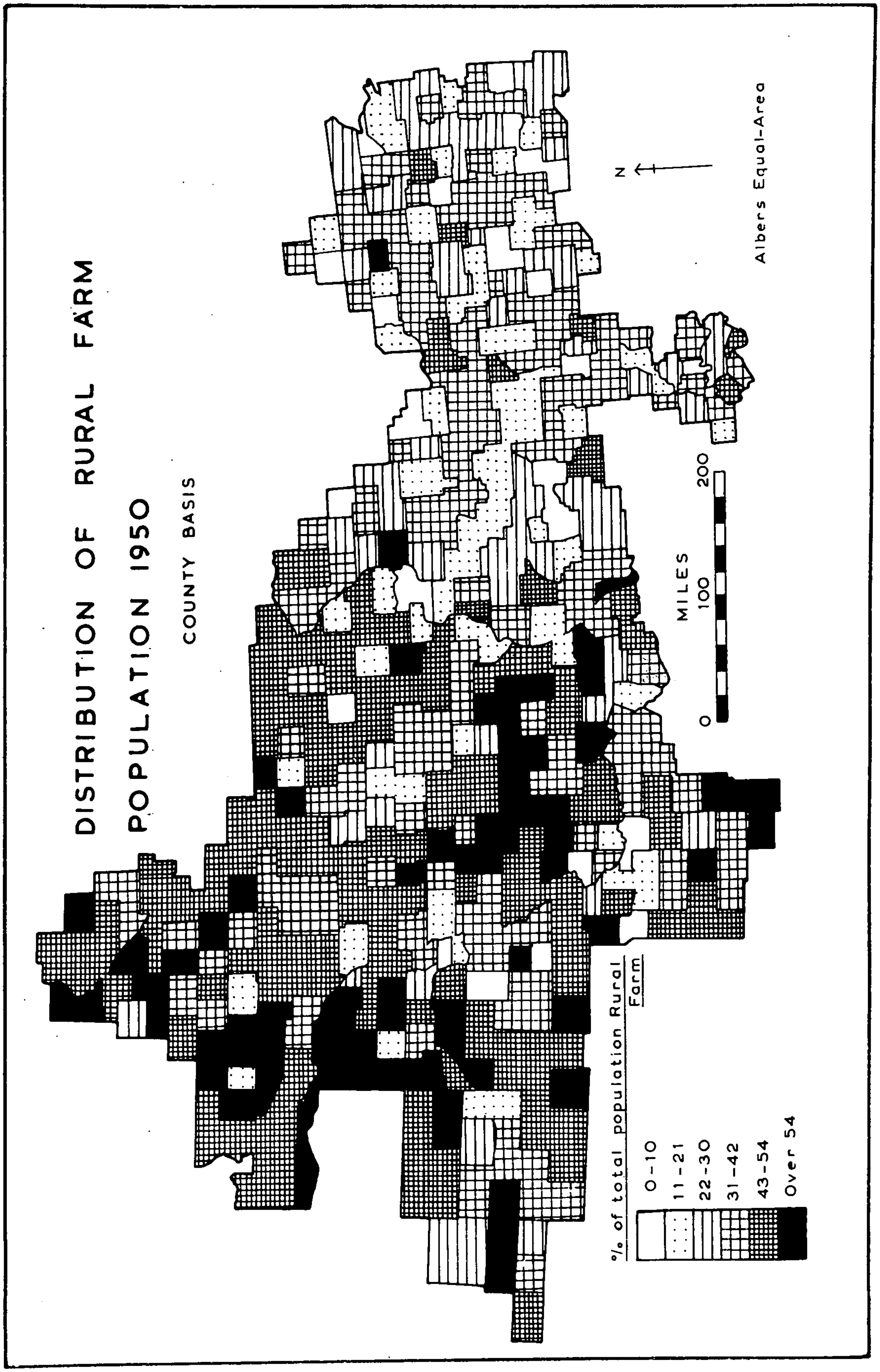
148. For the actual significance of part-time farming by farm operators in this and other peripheral regions vide Map 33 page 206 infra.

from the point of view of agriculture has been a substantial drift of farm operators from the region and the highest increases in farm size and mechanisation and the highest decreases in farm operators in the entire Corn Belt in the decade 1940 - 1950. Moreover the marginal nature of the smaller farm units has encouraged many operators to find seasonal employment off the farm. The result of this increase in farm size and mechanisation and heavy out-migration amounting to actual depopulation has been a considerable reduction in density of rural farm population to a level considerable below that of the heart of the Corn Belt.

The detailed distribution of rural farm population is plotted in Map 63 on a county basis, showing the relative significance of rural farm in the total population in 1950. Map 63 indicates that as far as the relative significance of of rural farm population was concerned, a very well-marked divide existed coinciding approximately with the Mississippi Valley separating the Western and Central Corn Belt with a very high proportion of rural farm, predominantly over 43% and in many counties over 54%, from the Eastern Corn Belt where the rural farm element was almost universally less than 30% and in many counties less than 20% of the total population.

The main factor in this east-west contrast was the differences in economic activity between an urbanised eastern sector with a predominance of urban population (Vide Map 60)



DISTRIBUTION OF RURAL FARM POPULATION 1950

COUNTY BASIS

% of total population Rural Farm
☐ 0-10
▒ 11-21
▥ 22-30
▦ 31-42
▩ 43-54
■ Over 54
MILES
0
100
200
N
Albers Equal-Area

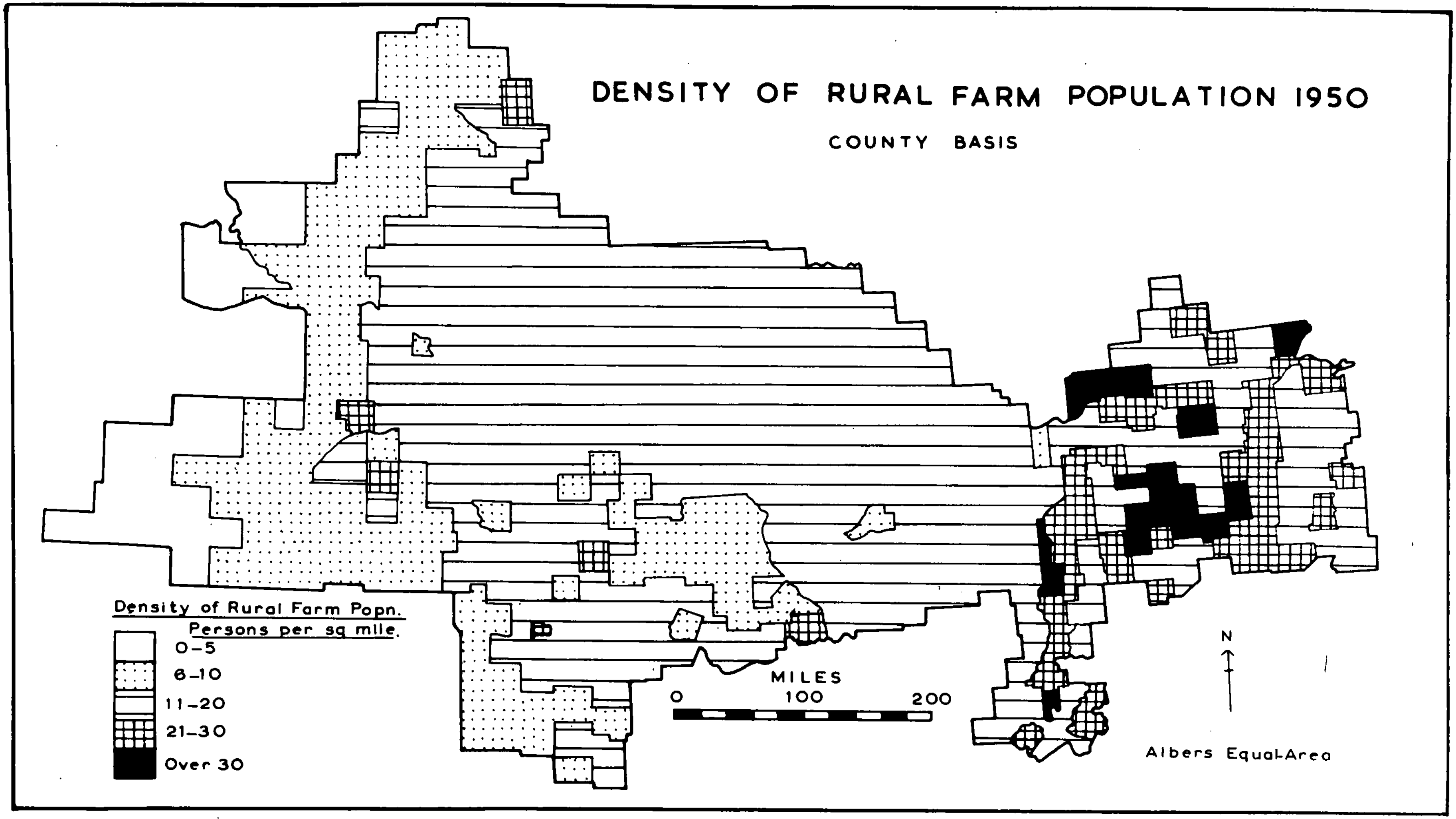
and consequently a higher proportion of rural non-farm. The Central and Western Corn Belt had few large cities and a much greater concentration of the labour force in agriculture and rural farm residence.

Absolute contrasts may be added to this relative distribution by a consideration of the variations in the density of rural farm population, as illustrated by Map 64.

It is apparent from Map 64 that by far the greater proportion of the Corn Belt, especially the central regions, had a uniform density of 11 - 20 rural farm residents per square mile. It has been suggested this uniformity essentially reflected the dispersed pattern of homesteads and the consistency in type of farming and size of holding over much of the heart of the Corn Belt.

Higher densities occurred particularly in the eastern and north-eastern periphery in areas of smaller farm holding and where proximity to urban centres has acted as a factor reducing the scale of migration. Conversely lower densities occurred in areas of extensive land use and larger farm unit where not only was overall density reduced but where the rural non-farm element was more significant in the agricultural labour force than in the Central and especially the Eastern Corn Belt. Moreover the density of the western and southern fringe has been greatly reduced in recent decades

MAP 64.



DENSITY OF RURAL FARM POPULATION 1950

COUNTY BASIS

Density of Rural Farm Popn.
Persons per sq mile.
0–5
6–10
11–20
21–30
Over 30
MILES
0
100
200
N
Albers Equal-Area

by heavy out-migration of farm population. This particularly applied to the southern fringe of poorer quality land which stood out in 1950 as an area of less than 10 rural farm persons per square mile.

Summary and Conclusions on the Distribution and Density of Rural Farm Population

1. The uniformity of distribution and density of rural farm population which characterised large areas of the Corn Belt was related to the method of survey and settlement under the terms of the 1785 Land Act. The rectangular pattern of farm holdings, homesteads and communications introduced an element of dispersion and regularity which has not been obliterated by subsequent changes of farm size and modification of the settlement pattern.

2. Farm size was an important factor influencing the density of rural farm population which in turn was related to the time at which the land was settled and contrasts in environmental and economic conditions.

3. The system of farming exerted a strong influence on density. In particular the system of family farm economic units made for a regularity of distribution and a relatively high density, whereas the larger farm of the extensive cropping and rearing of the western periphery with the greater reliance on hired labour resulted in a lowering of density of rural farm and a

relatively lower proportion of rural farm population in the total.

4. The actual type of farming accounted for the detailed variation in the distribution and density of rural farm population and theinfluence of variation in soils and climate as well as economic conditions was strong. There tended to be a direct relationship between the degree of intensity and profitability of farming and rural farm population which was exerted by the size of farm unit and the scale of out-migration. The lowest densities of under 10 per square mile occurred on the areas of most extensive land use in the western periphery and the areas of lowest per acre returns in the Ozark margin.

5. Migration was a very significant differential factor producing contrasts regionally. Rural farm migration has been shown to have been considerable throughout recent decades and has lowered densities appreciably. Moreover the age and sex selectivity of migration holds implications for the future. Out-migration was heaviest in the Southern and South Western Corn Belt and in many counties in these areas amounted to actual depopulation. Migration rates were rather lower in the heart of the Corn Belt where the family farm unit offered more stable employment opportunities but even here a decline in the rural farm population still obtained.

6. Distance from larger urban centres had a double influence

on rural farm population distribution and density. Firstly it facilitated a concentration on dairy and whole milk production resulting in profitable returns from the smallest farm units of the Corn Belt. Secondly proximity to towns offered alternative employment to farm operators and their families within commuting distance, both full time or part time. Moreover there was some movement of urban dwellers into rural farm residence in the rural-urban fringe though retaining their urban employment. The net effect of proximity to towns was to stabilise the rural farm population and accordingly the lowest loss by migration and highest densities of rural farm population occurred in the counties containing or adjacent to the larger urban centres of the Eastern Corn Belt.

The Composite Distribution and Density

The history of the evolution of the Corn Belt was one of contrasted trends, especially between the first century from 1800 to 1900 and the last fifty years since 1900. These trends have produced a composite settlement pattern in which there are elements of both uniformity and contrast. The individual distributions of the major residential groups have been described separately, it is now necessary to examine the inter-relation between them in the composite pattern.

It is the writer's opinion that there is an essential duality in the present population geography of the Corn Belt between two elements contrasted in terms of their evolution, distributional characteristics, present functional significance, landscape appearance and above all in their demographic characteristics. These two elements may be termed:-

(1) The Basic Corn Belt Pattern
(2) The Superimposed Urban and Suburban Pattern

These two elements may be described separately though it is impossible to differentiate between them accurately either statistically or cartographically, as there is considerable inter-relation and merging between the two. It is proposed therefore to develop this essential duality as a concept rather than attempt an evaluation incurring possible error and generalisation. It is the Writer's belief that such a concept, based on the previous findings of the thesis throws some light on the population geography of the Corn Belt and the genesis of the present complex pattern of distribution and density.

(1) THE BASIC CORN BELT PATTERN

The components of the basic Corn Belt pattern in 1950 were the agricultural labour force, the non-farm and urban workers of the rural service industries, a much smaller number of non-farm and urban residents employed in extractive and light industries, together with their families and dependents.

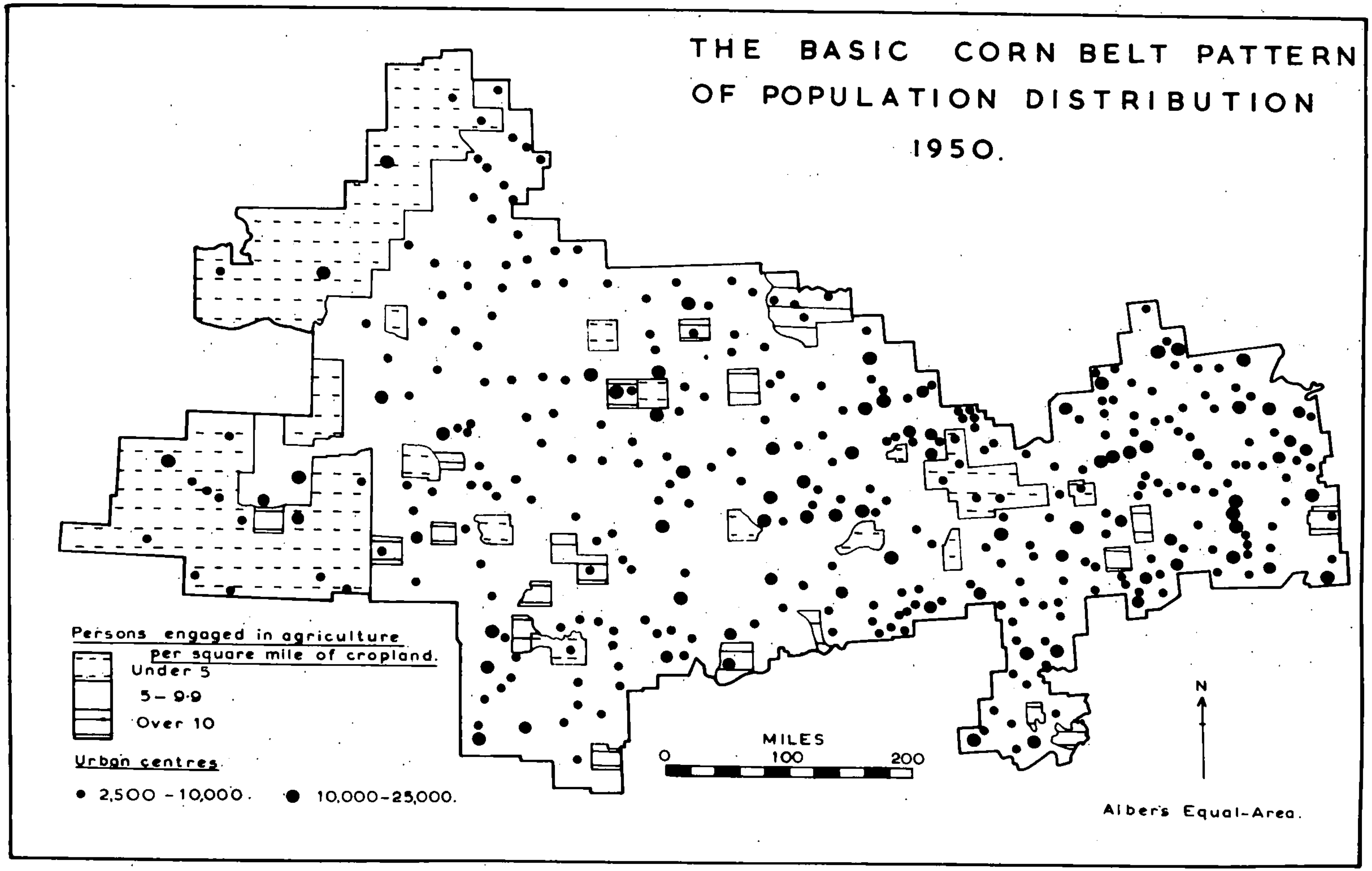
Within this organic pattern the most fundamental element was the agricultural labour force, the initial link with the soil, composed predominantly of the rural farm residents together with a small, but variable proportion of the rural non-farm population. The significance of the rural non-farm element in the agricultural labour force has been shown to vary with the intensity of agriculture and the proximity of urban centres. The spatial variation in the agricultural labour force has already been calculated (Map 32) and demonstrated to be extremely uniform in distribution and density though contrasts did arise between the Central Corn Belt and the periphery in relation to changes in type of agriculture. The agricultural labour force as the chief element in the basic Corn Belt pattern was resident in the dispersed farm homesteads in the case of the rural farm population and the scattered villages and hamlets in the case of the rural non-farm.

To this residential and functional structure a second element was organically related, the rural service centre. The rural service centres, of varying rank, size and order, consisted of urban population, supplemented by rural non-farm labour, employed basically in the provision of services for a tributary rural area. although in the case of many of the larger centres light industry, especially processing, was often significant. By definition the essential characteristic of the rural service centres is the organic relationship to the agricultural economy by their function as collecting, distributing, administrative and social foci for a tributary area, many of them being county capitals. These small towns fell predominantly within the range of 5,000 to 25,000, with the greater number (139 out of the 205) being within the range 5,000 - 12,000.

The distribution and consistency of size of these rural service centres adds to the uniformity of the basic Corn Belt pattern by their tendency to a regular inter-urban distance. The chief variables in inter-urban distance appeared to be overall population density, type of agriculture and the size rank of the service centre.

Map 65 is an attempt to map the essential characteristics of this basic Corn Belt pattern but does not represent a complete or exclusive enumeration. In Map 65 the distribution of towns within the size range 5,000 to 25,000 has been superimposed on the density of population engaged in agriculture per square mile of cropland. It is not a complete enumeration in that the families of persons engaged in agriculture are excluded and it is not an exclusive enumeration in that several of the towns plotted in the Eastern Corn Belt are not exclusively rural service centres but have significant industrial functions or are tributary to much larger industrial cities, which in part accounted for

MAP 65.



THE BASIC CORN BELT PATTERN OF POPULATION DISTRIBUTION 1950.

Persons engaged in agriculture per square mile of cropland.
Under 5
5 – 9·9
Over 10
Urban centres.
● 2,500 – 10,000.
● 10,000–25,000.
MILES
0
100
200
N
Alber's Equal-Area.

the greater concentration in this section of the Corn Belt. Moreover the concentration of towns in the southern section of Illinois was related to coal mining rather than service functions exclusively.

It may be considered, however, that Map 65 does accurately indicate a basic uniformity in the heart of the Corn Belt with agricultural densities between 5 and 9 persons per square mile of cropland. To the west the agricultural densities were lower in view of more extensive land use and rural service centres were commensurately more dispersed. In the east the increased agricultural density was matched by a concentration of service centres. In view of the vast size of the Corn Belt there was a remarkable homogeneity in the basic pattern of settlement with only relative contrasts between the heart and the peripheral regions.

This basic Corn Belt pattern of population distribution was essentially a modification of the initial settlement pattern, in existence by 1860. The chief modifications being the growth of rural service centres and an overall increase in density though with regional variations as a result of differential growth and migration.

Although the characteristics of the basic Corn Belt pattern are essentially of long standing the situation is not static. The proportion of population in the service centres of from 5,000 to 25,000 has been shown to be fairly stable, while the rural population, especially the farm element has been shown to have declined considerably over the last half-century. The basic pattern has lost population by net migration to the major cities of the Corn Belt and this suggests that the relationship between rural service centres and their tributary area is also changing.

(2) THE SUPERIMPOSED URBAN AND SUBURBAN DISTRIBUTION

The dominant characteristics of the basic Corn Belt distribution was its regularity and its relation to the early pattern of settlement. This contrasted sharply with the second element in the composite distribution and density, the superimposed pattern of large urban centres and sub-urban growth which was of an irregular nature and a product especially of the last fifty years.

The superimposed urban distribution was essentially of a more irregular and complex nature. The components were the urban populations of the large regional and industrial centres, a large proportion of the rural non-farm population resident in counties adjacent to the large cities and the sub-urban population resident in the rural-urban fringe associated functionally with the urban centres.

In this pattern, superimposed over the basic Corn

Belt pattern, there existed a greater complexity of economic activity and associated population characteristics. The functions of the cities were more complex than in the case of the rural service centres and were dependent on a more developed economic infra-structure. The result of this was a greater variety of employment composition and the removal of much of the labour force from any direct relationship with the Corn Belt agricultural economy.

Map 66 is an attempt to represent this superimposed urban distribution cartographically. The distribution of urban centres of over 25,000 inhabitants has been plotted and classified according to size, and in the case of cities of over 50,000 inhabitants, according to dominant function.[149] Many of the smaller cities had important functions as rural service centres of a higher order as well as possessing industry and in this sense they were related to both the basic and superimposed patterns of population distribution. In an attempt to plot the significance of the rural non-farm population related functionally to the superimposed urban distribution by virtue of urban employment counties with densities of over 21 rural non-farm persons per square mile were plotted. Although this does not represent exclusively

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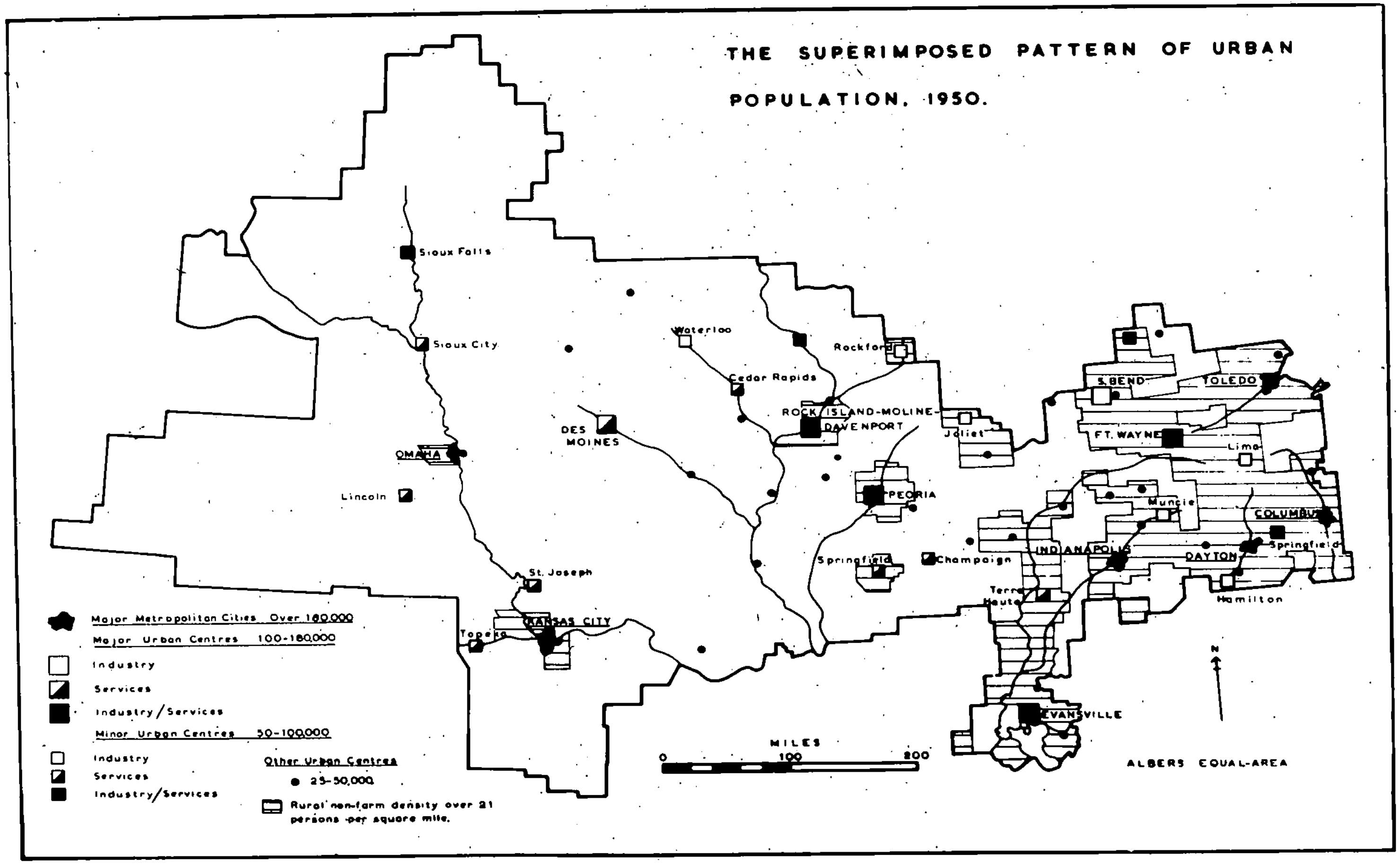
149. In Map 66 cities with over 45% of their civilian labour force employed in manufacturing industry were classified as "Industrial", cities with over 65% employed in services as "regional service centres"; and cities in which the proportion in each were approximately equal as having a combination of industrial and service functions.

MAP 66.



THE SUPERIMPOSED PATTERN OF URBAN POPULATION, 1950.

Sioux Falls
Sioux City
OMAHA
Lincoln
DES MOINES
Waterloo
Cedar Rapids
Rockford
ROCK ISLAND-MOLINE-DAVENPORT
Joliet
PEORIA
Springfield
Champaign
St. Joseph
KANSAS CITY
Topeka
S. BEND
TOLEDO
FT. WAYNE
Lima
Muncie
COLUMBUS
INDIANAPOLIS
DAYTON
Springfield
Hamilton
Terre Haute
EVANSVILLE
N
MILES
0
100
200
ALBERS EQUAL-AREA
Major Metropolitan Cities Over 180,000
Major Urban Centres 100-180,000
Industry
Services
Industry/Services
Minor Urban Centres 50-100,000
Industry
Services
Industry/Services
Other Urban Centres
● 25-50,000
Rural non-farm density over 21 persons per square mile.

the rural non-farm element which was economically related to urban employment it does indicate the degree to which high densities of rural non-farm population were concentrated in close proximity to large urban centres and may be used as a reliable index.

Recognising certain limitations the characteristics of the superimposed urban and suburban pattern may be described by reference to Map 66. Table 78 (page 354 supra) indicated that in the 59 cities with more than 25,000 inhabitants in 1950 resided 5,119,644 persons, or 58.2% of the total urban population of the Corn Belt. To this figure must be added a large proportion of the rural non-farm population of the Corn Belt which was functionally related to these urban centres. It is difficult to calculate the numerical significance of this rural non-farm element but it was concentrated predominantly in the East Central Lowland and Lower Great Lakes regions. Table 19 (page 93 supra) tabulated the rural non-farm population of these regions as being 1,588,505 in 1950, and Map 66 indicates the extent to which this population was concentrated in counties adjacent to the larger urban centres.

A further indication of thenumerical significance of the superimposed urban distribution is offered by the total population of the Standard Metropolitan Areas. This is tabulated in Table 80 below.

TABLE 80

POPULATION IN STANDARD METROPOLITAN AREAS OF THE CORN BELT, 1950

By order of magnitude

STANDARD METROPOLITAN AREA	POPULATION
Kansas City	814,357
Indianapolis	551,777
Columbus	503,410
Dayton	457,333
Toledo	395,551
Omaha	366,395
Peoria	250,512
Davenport - Rock Island - Moline	234,256
Des Moines	226,010
South Bend	205,058
Fort Wayne	183,722
Evansville	160,422
Rockford	152,385
Hamilton - Middletown	147,203
Springfield (Illinois)	131,484
Kalamazoo	126,707
Lincoln	119,742
Springfield (Ohio)	111,661
Topeka	105,418
Terre Haute	105,160
Cedar Rapids	104,274
Sioux City	103,917
Waterloo	100,448
Decatur	98,853
St. Joseph	96,826
Muncie	90,252
Lima	88,183
Sioux Falls	70,910
TOTAL POPULATION	6,102,126

Source: U.S. Bureau of the Census, Census of Population, 1950
Vol. ii. Characteristics of the Population. Table 10.

Although the Standard Metropolitan Areas included only the cities in the size categories over 50,000, since the figures also included the population of the immediate hinterlands economically related to the central cities, Table 80 does offer further evidence of the size of the population associated with the superimposed urban and suburban pattern.[150] It is seen from Table 80 that in 1950 over 6 million persons were resident in the Standard Metropolitan Areas of the Corn Belt, over 37% of the total population.

From Map 66 the extremely irregular distribution of the superimposed urban net is apparent. Essentially it was an eastern distribution especially when the rural non-farm element is considered. The components were the industrial zones of Central Indiana, the Lower Great Lakes and Western Ohio, together with a more scattered distribution of regional service centres and industrial cities. The actual functions of the component cities were varied in terms of dominance of industry and services in the labour force. There was a tendency for inter-urban distance to increase westwards away from the three industrial zones and a tendency for the urban population to be concentrated in a smaller number of large cities in which service functions occupied the greater proportion of the labour force.

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150. For the definition of Standard Metropolitan Areas, Vide Chapter 1, pp. 10-12 and Map 2.

It may be suggested that the development of this superimposed pattern of urban distribution occurred at a much later date than that of the basic Corn Belt pattern. Map 14 (page 68 supra) indicated that most of the major cities of the superimposed pattern were established by 1860 but were then relatively small, for the most part under 10,000 inhabitants. It was shown in Chapter Nine that the period of rapid urban expansion came after 1900 and coincided with industrial growth and migration from the farm population to urban employment. In fact the redistribution of population described in Chapter Eight was essentially a migration of population from the basic Corn Belt pattern to the urban and rural non-farm residence of the superimposed pattern.

A further distinctive feature of the superimposed urban pattern was the suburban growth associated with rapid population increase in recent decades. This suburban growth may be evaluated by a consideration of the proportion of total population resident in the central cities and urban fringes of the urbanised areas of the Corn Belt. This was tabulated in Table 79 (Appendix). Suburban growth was shown by Table 79 to have had contrasted characteristics as between the various urbanised areas. In general suburban development varied directly with the total population of the city but more especially was related to the significance of industry rather than service functions.

SUMMARY OF DETAILED DISTRIBUTION & DENSITY -CONTRASTS BETWEEN THE BASIC CORN BELT PATTERN AND THE SUPERIMPOSED URBAN AND SUB-URBAN DISTRIBUTION

The two components of the composite pattern of distribution and density have been described in detail and were found to be greatly contrasted in their demographic characteristics. These contrasts may be mentioned briefly as a summary to the distributional characteristics of population in the Corn Belt.

1. The basic Corn Belt pattern of population distribution, composed of a dispersed population engaged in agriculture together with the functionally related rural service centres, comprised the fundamental expression of the distinctive agricultural economy of the Corn Belt and as such was a universal pattern of distribution. By contrast, the superimposed pattern of large regional and industrial centres toegther with the rural non-farm labour force associated with urban functions had a more restricted and irregular distribution.

2. Whereas the basic Corn Belt pattern had a high degree of regularity in distribution and density with the chief contrasts being between the heart and the peripheral areas the superimposed urban pattern was irregular and resulted in the concentration of the total population in the Eastern Corn Belt. In the total composite pattern therefore the basic rural pattern comprised the fundamental structure of population

distribution in which there was a high degree of uniformity, while the superimposed urban net was responsible for the major contrasts in distribution and density.

3. The two patterns were contrasted in the manner and occurrence of their evolution. The basic pattern was a modification of the initial settlement pattern established before 1900 while the superimposed urban net was a product of the rapid urban expansion after 1900 and especially of rapid suburban growth after 1930.

4. The two distribution patterns were not entirely separate, they were linked by such factors as part-time farming by farm operators and the fact that many of the larger cities, in addition to their industrial functions, were also regional capitals functioning as collecting and distributing centres for agricultural produce on a major scale. Moreover the two patterns were linked demographically by the movement of population continuous since as early as 1900, from rural areas into the urban centres. Reference to migration statistics for the decade 1940 - 1950 indicated that current redistribution of population is continuing to widen the gap in total population between the two distributions even further.

The keynote of the demographic evolution of the Corn Belt since 1800 has been movement of population both in the initial settlement period and subsequent decades of redistribution. In recent decades this movement has been almost exclusively a redistribution of population from the basic Corn Belt pattern into the urban centres of the superimposed pattern of distribution. This is suggested as the chief claim to validity of the concept of a duality in population distribution and density in the Corn Belt that has been advanced in this chapter. It is the Writer's opinion that such a concept makes a meaningful distinction between that proportion of the population of the Corn Belt which was directly related organically to the agricultural economy, and the greater proportion which had only an indirect relation to the Corn Belt type of agriculture.

CONCLUSIONS

CONCLUSIONS

The major findings of the present research have been presented stage by stage in frequent summaries throughout the thesis while the final chapter brought together the findings relevant to an understanding of the present pattern of population distribution and density. It is not considered necessary to recapitulate in detail what has already been presented in chapter summaries but rather to make some final assessment of the significance of the findings of the research.

In the evolution of the composite pattern of population distribution and density that existed in 1950 one process above all others has been, and continues to be, of the greatest significance, that is the migration of population. Population mobility stands out as the chief constant in the demography of the Corn Belt in the form of an initial occupation and subsequent redistribution which in varying degree has influenced all other aspects of demography. This movement has been described as an advance into, and a partial retreat from, the heartland of the United States. The advance of the initial occupation was shown to have been tentative at first but gaining rapidly in momentum after 1840 until by 1870 the whole area of the present Corn Belt had been pioneered and the basis of its distinctive agricultural economy established. It is not surprising, therefore, that after a period of seventy years in which an area almost equal in size to the United

Kingdom and France combined had been pioneered and settled, the dominant process of the subsequent decades should be the redistribution of population in response to changes brought about by the economic development of the area. Consequently, by the close of the nineteenth century, in response to changes in the agricultural economy and the impetus of urban expansion based on industrial activity, redistribution of population had commenced and despite the effect of the depression, took place at an increasing tempo until by 1950 actual depopulation was of regional significance in the Corn Belt.

It is the Writer's opinion that a detailed appreciation of the character of the initial settlement and later redistribution by internal migration is essential to the understanding of the demography of the Corn Belt because of the impact of this population movement on all other aspects of the mechanism by which the present situation has evolved. Certain implications of population movement may be indicated as having been critical in this respect:-

1. In the settlement phase, the occupation of the land under the terms of the 1785 Land Act which imposed the control of settlement within the framework ofthe rectangular survey system and minimum purchase lots, implied a regularity and dispersion in the settlement pattern which has survived in essence in the present day basic Corn Belt pattern and is a

significant factor in the distribution and density of farm population. The fact that this occupation was to a large extent a controlled movement under the terms of the 1785 Land Act, the Northwest Ordinance and the 1861 Homestead Act, with legally defined consolidated holdings, to a large degree accounts for the incredible uniformity in the basic pattern of distribution and density of the population directly related to the agricultural economy.

2. The anti-slavery terms of the Northwest Ordinance were a significant factor in the racial homogeneity of the Corn Belt population.

3. The entry of foreign-born white immigrants into the Corn Belt, attracted initially by the free land available under the terms of the 1862 Homestead Act and subsequently by the employment opportunities in the expanding urban centres has been a significant factor in relation to the present day distribution of minority cultural groups.

4. The present distribution and increasing significance of negro population in the Corn Belt is again related to migration patterns with origins outside the Corn Belt.

5. A very strong relationship exists between migration patterns within the Corn Belt and changes in the employment composition. One of the chief causative factors in

internal migration is economic advantage and in the Corn Belt this has been associated with a drift from the land and agricultural employment to the urban centres, which in turn has effected drastic changes in distribution of population. On a more local scale, daily movement to work has been a factor in the location of dense rural non-farm population in close proximity to the urban centres of the Eastern Corn Belt, which again has been a strong influence in the overall distribution and density of population.

6. The age and sex structure of the Corn Belt population has been considerably modified by the effect of differential internal migration. In particular the movement from rural to urban areas has effected important differentials on a basis of residence. Age selectivity in migration has produced a high median age in the residual rural population and a correspondingly lower median age in urban centres. Similarly sex selectivity has resulted in a high sex ratio characterising areas of depopulation and a low sex ratio in the case of urban residents.

7. The distortion of the age and sex structure by migration has had considerable implications in relation to natural increase. The concentration of the more fertile age groups in the towns produced a high crude birth rate in the decade 1940 - 1950, while in the rural farm population

the combination of the loss of the younger age groups, the unbalanced sex ratio and the higher mortality rate associated with a high median age resulted in a low rate of natural increase.

8. The consequence of redistribution of population and its associated influences on natural increase has been a drastic modification of the initial settlement pattern. In particular it has been shown to have produced a composite pattern of distribution in which an irregular urban and suburban net has been superimposed on the more uniform basic agricultural pattern. So great has been the significance of migration and its impact on differential urban and rural population increase that the majority of the Corn Belt population is now concentrated in the superimposed urban distribution. Moreover the continuation of this migration pattern is further widening the gap between the two distributional patterns and increasing the concentration of the population in the Eastern Corn Belt and the peripheral cities at the expense of the central and western areas.

In view of the impact of internal migration and the high degree of population mobility it is the Writer's view that no consistent division of the Corn Belt into demographic regions is valid. It is suggested that the only valid criterion for distinguishing areas of contrasted population characteristics is the balance of migration and natural increase as factors determining population change. This has been found to be the critical ratio which summarises the remaining population characteristics from the point of view of age and sex composition, vital statistics, employment structure and population growth. The relative significance of net migration and natural increase in population change was plotted in detail in Map 46, page 303 supra. Any generalisation of this map into demographic regions would, in the Writer's view, result in an artificial division concealing significant variations and present a static interpretation of what is essentially a dynamic situation.

It is considered far more valid to recognise a fundamental duality in the Corn Belt population between a basic agricultural pattern and a superimposed urban and suburban pattern, strongly contrasted in their residential components, economic function and detailed demographic characteristics, rather than to parcel out the area into regions embracing elements of both patterns. As a result of this contrast in the demographic characteristics of the two distinct distributional patterns the Corn Belt cannot be regarded as an area of demographic uniformity. However, within the basic Corn Belt pattern a remarkable degree of uniformity has been shown to exist in the distribution and density of the population functionally related with agriculture.

It is suggested that this very specific uniformity, which it must be remembered involved less than half of the total population, may be advanced as the strongest argument for recognising the Corn Belt as a distinctive demographic area. In all other aspects of demography uniformity was found to be lacking.

It was stated in the Introduction that one objective in the work presented was the relation of population characteristics to the physical, economic and social background. This has been consistently attempted but two major factors were found to impose limitations. Firstly, certain inadequacies in the census material were found insuperable. Particularly the lack of adequate information on the critical consideration of migration necessitated the use of derived material which in some cases must be recognised as approximation rather than enumeration. Moreover the length of statistical operations in deriving migration data restricted the detailed analysis to the most recent decade. A further serious limitation was the lack of precise information on the characteristics of the rural non-farm group which is enumerated as one category but which forms the most diffuse residential group from the point of view of function. Secondly, certain limitations of technique were recognised, especially the rather limited amount of accurate inference that can be obtained from the areal coincidence of selected phenomena. Areal coincidence does not imply a functional relationship no matter how refined a statistical technique is employed in analysis.

In spite of these significant limitations the present thesis has described the demography of an area which must be considered as the heartland of the United States both from the point of view of geographical location and the national agricultural economy. The disturbing feature of the findings was the extent to which migration occurred as a demographic constant and in particular took the form of rural depopulation on a regional scale. That the withdrawal of population from rural areas and out of direct contact with agriculture and its deposition in urban centres and suburban sprawl was a response to changing economic conditions cannot be gainsaid. However, the long-term implications of the depopulation of the geographic and agricultural heart of a continent are something which must surely give pause for thought and concern in the future.

APPENDIX

-:-:-

TABLE 9

URBAN DEVELOPMENT IN THE CORN BELT, 1810 - 1860, NUMBER OF TOWNS

CENSUS	1810	1820		1830			1840		
SIZE OF URBAN CENTRE	UNDER 500	UNDER 1,000	1,000-1,500	UNDER 1,000	1,000-2,500	OVER 5,000	UNDER 2,500	2,500-5,000	OVER 5,000
Ohio	2	2	3	5	3	2	8	1	2
Kentucky							1		
Indiana							4	1	
Illinois							5	2	
Michigan							1		
Missouri									
Iowa									
Kansas									
Nebraska									
TOTAL	2	2	3	5	3	2	19	4	2

CENSUS	1850				1860			
SIZE OF URBAN CENTRE	UNDER 2,500	2,500-5,000	5,000-10,000	OVER 10,000	UNDER 2,500	2,500-5,000	5,000-10,000	OVER 10,000
Ohio	11	5	2	2	9	6	3	3
Kentucky	2							
Indiana	20	3	2		15	5	5	2
Illinois	10	3	2		8	5	7	2
Michigan	1	2				2	2	
Missouri	2				3	2	2	
Iowa	5	3			6	3	4	2
Kansas					3	1	1	
Nebraska					1			
TOTAL	51	16	6		45	26	24	9

Source: Calculated from U.S. Census of Population, 1950, Volume 11. Characteristics of Population Table 4.

TABLE 10

THE GROWTH OF URBAN POPULATION IN THE CORN BELT, 1810 - 1860, BY SIZE OF TOWN

	OHIO	KENTUCKY	INDIANA	ILLINOIS	MICHIGAN	MISSOURI	IOWA	KANSAS	NEBRASKA	TOWN SIZE
1810	583									Under 500
1820	1,029									Under 1,000
	5,294									1,000-2,500
1830	6,008	229								Under 2,500
	5,796									2,500-5,000
1840	8,977	500	4,484	5,542	1,703					Under 2,500
	3,977		2,692	5,137						2,500-5,000
	12,115									5,000-10,000
1850	13,856	2,990	23,162	10,409	1,064	2,671	7,710			Under 2,500
	16,058		11,568	7,983	5,320		9,730			2,500-5,000
	12,209		14,220	11,997						5,000-10,000
	28,859									Over 10,000
1860	16,646		22,213	15,610		2,032	8,743	2,566	1,883	Under 2,500
	23,264	4,805	16,597	18,781	6,897	7,582	11,246	2,616		1,500-5,000
	21,851		38,733	46,512	12,283	15,637	25,380	7,429		5,000-10,000
	52,403		30,095	27,763			24,267			Over 10,000

Source: Calculated from U.S. Bureau of the Census, Census of Population, 1950, Vol.ii. Characteristics of the Population, Table 4.

TABLE 11

GROWTH AND RATE OF INCREASE OF SELECTED URBAN CENTRES, 1810-1860

A. Total Population Growth

CITY	1810	1820	1830	1840	1850	1860
Dayton	383	1,000	2,950	6,067	10,977	20,081
Chillicothe		2,426	2,846	3,977	7,100	7,626
Columbus (Ohio)			2,435	6,048	17,882	18,554
Hamilton (Ohio)		660	1,079	1,409	3,210	7,223
Springfield (Ohio)		1,868	1,080	2,062	5,108	7,002
Toledo				1,222	3,829	13,768
Indianapolis				2,692	8,091	18,611
Terre Haute					4,051	8,594
Evansville					3,235	11,484
Lafayette					6,129	9,387
Fort Wayne					4,282	9,121
Peoria				1,467	5,095	14,045
Quincy				2,319	6,902	13,718
St. Joseph						8,932
Kansas City						4,418
Davenport						11,267
Dubuque						13,000
St. Louis (2)			4,977	16,469	77,860	160,773
Louisville	1,357	4,012	10,341	21,210	43,194	68,033
Cincinatti	2,540	9,642	24,831	46,338	115,435	161,044
Chicago				4,470	29,963	112,172

SEE NEXT PAGE FOR CONTINUATION OF TABLE 11

B. RATE OF POPULATION GROWTH (1)

CITY	1810	1820	1830	1840	1850	1860
Dayton	-	161.1	195.0	105.7	80.9	82.9
Chillicothe		-	17.3	39.7	78.5	7.4
Columbus (Ohio)			-	148.4	195.7	3.8
Hamilton (Ohio)		-	63.5	30.6	127.8	125.0
Springfield (Ohio)			42.2	90.9	147.7	37.1
Toledo					213.3	259.6
Indianapolis					200.6	130.0
Terre Haute						112.1
Evansville						255.0
Lafayette						53.2
Fort Wayne						113.0
Peoria					247.3	175.7
Quincy					197.6	98.8
St. Joseph						-
Kansas City						-
Davenport						509.7
Dubuque						318.3
St. Louis				230.9	372.8	106.5
Louisville				105.1	103.6	57.5
Cincinnati				86.6	149.1	39.5
Chicago					570.3	274.4

Source: Calculated from U.S. Bureau of the Census, Census of Population, 1950, Vol.ii. Characteristics of Population, Table IV.

(2) on previous page. Cities peripheral to the Corn Belt in 1950

(1) on this page. Rate of increase - ibcrease % over preceding decade

TABLE 23

THE DISTRIBUTION OF POPULATION BY AGRICULTURAL REGIONS, 1950

Agricultural Region	TOTAL	URBAN	RURAL FARM	RURAL NON-FARM
Cattle Feeding and Hogs (Missouri Valley)	2,264,558	1,403,262	258,695	380,088
Cattle Feeding and Hogs (Iowa-Illinois)	1,108,404	600,233	388,606	267,213
Cash Corn, Oats and Soybeans (Iowan Prairie)	505,225	304,630	106,135	94,751
Cash Corn, Oats and Soybeans (Grand Prairie)	1,256,294	687,727	223,192	345,375
Hogs and Soft Winter Wheat	4,034,870	2,563,813	562,934	908,123
Livestock, Dairy, Soybeans and Cash Grain	1,894,482	1,026,940	386,489	481,053
Hogs and Dairy	1,160,300	598,723	295,878	265,699
Livestock and Cash Grain	1,286,589	304,130	580,330	402,129
Livestock, Cash Grain and Dairy	739,915	418,818	171,089	150,008
Livestock and Pasture (Central Corn Belt)	1,123,032	394,292	411,184	327,556
Livestock and Pasture (Indiana-Michigan border)	675,009	413,743	98,190	163,076
TOTAL CORN BELT	16,049,210	8,716,650	3,555,590	3,774,970

Source: Calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume 1i. Characteristics of the Population, Table 12.

TABLE 24

THE PROPORTIONAL DISTRIBUTION OF POPULATION IN THE AGRICULTURAL REGIONS OF THE CORN BELT, 1950

Agricultural Region	TOTAL	URBAN	RURAL FARM	RURAL NON-FARM
Cattle Feeding and Hogs (Missouri Valley)	14.1	16.1	7.3	10.0
Cattle Feeding and Hogs (Iowa-Illinois)	6.9	6.8	12.9	7.2
Cash Corn, Oats and Soybeans (Iowan Prairie)	3.1	3.5	3.0	2.5
Cash Corn, Oats and Soybeans (Grand Prairie)	7.9	7.9	6.3	9.2
Hogs and Winter Wheat	25.1	29.4	15.8	23.1
Livestock, Dairy, Soybeans and Cash Grain	11.8	11.8	10.9	12.7
Hogs and Dairy	7.3	6.9	8.3	7.1
Livestock and Cash Grain	8.0	3.5	16.4	10.7
Livestock, Cash Grain and Dairy	4.6	4.8	4.8	4.8
Livestock and Pasture (Central Corn Belt)	7.0	4.5	11.6	8.7
Livestock and Pasture (Indiana-Michigan border)	4.2	4.8	2.7	4.0
TOTAL CORN BELT	100.0	100.0	100.0	100.0

SourceL Calculated from Table 21

TABLE 25

COMPOSITION BY RESIDENCE OF THE POPULATION OF THE AGRICULTURAL REGIONS OF THE CORN BELT, 1950

Agricultural Region	URBAN	RURAL FARM	RURAL NON-FARM
Cattle Feeding and Hogs (Missouri Valley)	62.0	11.9	26.1
Cattle Feeding and Hogs (Iowa-Illinois)	54.3	35.0	10.7
Cash Corn, Oats and Soybeans (Iowan Prairie)	60.5	21.0	18.5
Cash Corn, Oats and Soybeans (Grand Prairie)	54.5	17.8	27.7
Hogs and Soft Winter Wheat	63.6	13.7	22.7
Livestock, Dairy, Soybeans and Cash Grain	54.3	20.4	25.3
Hogs and Dairy	51.5	25.4	23.1
Livestock and Cash Grain	41.9	45.0	13.1
Livestock, Cash Grain and Dairy	56.7	23.2	20.1
Livestock and Pasture (Central Corn Belt)	35.0	36.7	28.3
Livestock and Pasture (Indiana-Michigan border)	61.2	14.6	24.2
TOTAL CORN BELT	54.5	22.2	23.2

Source: Calculated from Table 21

TABLE 39

COMPOSITION OF FOREIGN-BORN WHITE POPULATION IN SELECTED URBANISED AREAS, 1950

Classified by Country of Origin

URBANISED AREA	TOTAL	ENGLAND & WALES	SCOTLAND	EIRE	SCANDINAVIA	NETHERLANDS	FRANCE	GERMANY	POLAND	GREECE	ITALY	CANADA	MEXICO	CZECHOSLAVAKIA	AUSTRIA	HUNGARY	U.S.S.R.	YUGOSLAVIA	ASIA	OTHERS
Columbus	12,734	1,175	286	408	179	41	148	2,123	401	480	2,439	771	31	179	438	647	985	317	263	1423
Dayton	10,235	730	207	293	132	56	133	2,665	541	388	617	647	35	180	357	1,151	616	348	230	909
Toledo	22,592	1,249	482	549	409	64	242	3,760	4,195	645	832	2,049	294	769	503	1,771	942	168	735	1,934
Fort Wayne	3,706	285	64	85	89	31	71	1,227	202	266	213	347	52	19	82	60	133	21	90	369
Indianapolis	10,007	877	352	850	299	119	172	2,076	361	464	560	708	47	95	369	257	600	337	313	1,142
South Bend	12,184	409	135	174	450	167	98	1,023	2,362	280	700	664	31	153	605	2,149	410	310	109	1,955
Rock Island-Davenport	11,749	432	153	207	2,271	191	125	2,219	276	460	293	443	502	200	195	71	515	107	131	1,960
Peoria	5,306	557	201	198	343	30	134	1,367	174	162	310	314	53	42	180	124	184	166	206	561
Rockford	12,349	430	169	94	6,392	39	71	574	141	115	2,387	315	101	54	74	21	99	19	28	920
Springfield, Ill.	4,245	366	210	96	86	13	116	825	115	56	741	144	22	64	298	155	106	69	33	700
Cedar Rapids	3,353	181	62	116	275	29	15	287	54	124	54	179	45	1,390	57	10	140	17	157	161
Des Moines	6,728	691	213	190	1,298	64	111	556	270	158	1,138	426	216	49	134	28	434	141	87	524
Omaha	19,575	712	209	503	3,563	59	83	2,349	1,909	234	2,458	705	490	2,281	476	212	1,551	162	199	1,520
Sioux City	5,049	256	73	99	1,428	158	27	571	229	194	133	286	80	67	59	17	792	17	175	388
Waterloo	2,600	215	68	88	654	57	15	654	58	102	33	198	40	39	41	8	123	33	19	155
Lincoln	4,374	228	42	75	470	16	32	630	56	71	59	194	68	120	49	18	1,900	4	78	264
Kansas City	22,753	1,439	381	1,055	1,466	92	271	2,661	1,833	452	2,482	1,342	1,976	318	867	222	2,510	1,299	301	1,786
St. Joseph	2,174	115	22	120	90	8	23	459	238	50	86	95	147	36	67	54	311	47	59	147
Topeka	2,124	218	56	54	246	9	34	230	59	19	27	271	440	13	26	10	275	1	24	112
Kalamazoo	5,249	333	87	74	166	2,172	36	367	382	107	132	505	35	66	71	164	114	43	45	350
TOTAL	179,086	10,898	3,472	5,328	20,296	3,415	1,963	26,62[illegible]	14,756	4,917	15,694	10,603	4,705	6,134	4,948	7,149	12,740	3,926	3,282	18,280

TABLE 50

THE MANUFACTURING LABOUR FORCE OF THE URBANISED AREAS OF THE CORN BELT, 1950

Urbanised Area	Total Civilian Labour Force	% Employed in manufacturing	% Employed in Engineering, Metals and Food		
			Eng.	Metals	Food
South Bend-Mishawaka	72,813	54.5	35.4	-	1.9
Kalamazoo	35,599	46.7	5.9	5.0	-
Toledo	148,489	38.8	17.5	4.8	2.3
Hamilton-Middleton	24,317	56.0	19.5	12.0	-
Dayton	141,379	47.0	27.6	3.1	1.9
Springfield (Ohio)	40,983	41.5	18.3	3.3	-
Columbus	176,658	30.6	7.9	4.5	3.0
Indianapolis	245,727	38.5	15.8	4.5	3.8
Fort Wayne	59,472	44.5	26.8	3.3	3.3
Terre Haute	31,029	28.2	-	-	8.3
Evansville	55,171	44.8	22.0	-	5.7
Decatur	30,019	34.0	5.2	-	6.8
Peoria	65,021	45.8	23.6	2.4	7.2
Rockford	54,743	56.5	22.2	16.5	-
Springfield (Ill.)	40,963	27.6	11.6	-	3.7
Rock Island-Moline	81,162	45.4	25.3	7.2	2.9
Cedar Rapids	34,494	39.6	13.8	-	13.3
Des Moines	85,448	26.8	4.6	-	3.3
Sioux City	37,460	29.3	-	-	13.6
Waterloo	36,074	48.2	18.3	-	15.5
Kansas City	198,227	30.6	5.9	3.2	5.4
Omaha	127,945	25.8	-	1.6	10.6
Topeka	43,901	20.8	-	-	5.4
Lincoln	42,563	21.4	-	-	2.5
St. Joseph	31,958	33.4	-	16.4	-

Source: Calculated from U.S. Bureau of the Census, Census of Population, 1950. Vol. ii. *Characteristics of the Population*. Table 35.

TABLE 51

PERCENTAGE LABOUR FORCE EMPLOYED IN SERVICE INDUSTRIES IN THE URBANISED AREAS OF THE CORN BELT IN 1950

Urbanised Area	% Employed in Services	% Employed in Transport	% Employed in Public Administration	% Employed in trade
Lincoln	77.4	7.5	7.8	24.5
Topeka	73.6	12.1	8.7	20.5
Omaha	73.5	13.3	4.6	23.8
Des Moines	72.3	5.6	6.4	25.6
Sioux City	69.5	7.5	-	31.4
Springfield (Ill.)	69.3	5.2	11.3	22.5
Kansas City	68.8	9.9	4.9	15.2
Terre Haute	67.9	9.7	4.5	25.5
St. Joseph	65.2	7.9	3.4	27.5
Decatur	65.1	10.0	5.2	23.2
Columbus	62.4	7.1	7.6	22.1
Indianapolis	61.3	6.5	4.7	22.0
Toledo	60.6	8.8	4.4	16.7
Cedar Rapids	59.2	5.5	-	24.6
Springfield (Ohio)	57.7	3.7	5.5	15.0
Evansville	54.1	5.5	2.7	22.4
Rock Island-Moline	54.0	4.7	2.6	21.8
Peoria	53.5	4.7	2.8	22.0
Kalamazoo	52.7	-	-	19.7
Dayton	52.6	2.5	11.0	17.7
Fort Wayne	52.2	6.9	2.8	27.0
Waterloo	50.6	5.3	-	21.4
South Bend	45.2	3.0	6.3	17.5
Hamilton	43.5	-	-	17.0
Rockford	43.1	2.1	2.0	18.6

Source: Calculated from U.S. Bureau of the Census, Census of Population, Vol.ii. Characteristics of the Population, Table 35.

TABLE 53

SEX RATIOS OF THE URBANISED AREAS OF THE CORN BELT IN 1950

Urbanised Area[1]	Sex Ratio	Nonwhite Sex Ratio[2]
Kansas City	92	
Indianpolis	93	91
Columbus	96	
Toledo	97	
Dayton	96	
Omaha	94	
Des Moines	91	
Davenport-Rock Island-Moline	98	
South Bend	101	101
Peoria	98	
For Wayne	93	93
Evansville	93	92
Rockford	95	
Lincoln	91	
Springfield (Illinois)	90	
Sioux City	94	
Topeka	90	
Waterloo	95	
Kalamazoo	94	
St. Joseph	90	
Springfield (Ohio)	93	
Cedar Rapids	93	
Terre Haute	92	
Decatur	92	
Hamilton	95	

Source: U.S. Census of Population, 1950, Vol.ii. Characteristics of Population, Table 35.

1. Arranged in order of descending magnitude of total population.

2. Nonwhite almost exclusively negro - significant nonwhite groups only.

TABLE 55

MARITAL STATUS BY AGE GROUPS IN INDIANA AND IOWA, 1950

Indiana		15-19	20-24	25-44	45-54	55-64	65-74	75-84	Over 85
Married	Male	3.6	46.3	85.9	86.8	82.7	72.6	53.5	32.8
	Female	18.4	70.8	86.3	79.9	68.7	46.6	20.2	8.2
Single	Male	96.3	52.3	10.8	7.1	6.8	7.2	6.1	5.3
	Female	81.1	26.6	7.6	6.4	6.4	18.0	7.2	7.3
Widowed	Male	0.1	0.1	0.5	2.6	7.3	18.0	39.1	61.1
	Female	0.1	0.3	3.7	9.3	21.9	43.1	70.1	84.0

Iowa									
Married	Male	2.9	42.7	84.6	85.6	81.8	71.3	55.2	33.8
	Female	15.0	69.0	87.3	81.5	69.9	44.0	22.8	0.8
Single	Male	97.0	56.4	12.8	9.4	9.1	10.7	8.7	7.6
	Female	84.7	29.3	8.3	8.1	8.4	9.4	8.5	0.7
Widowed	Male	0.1	0.1	0.5	1.0	6.3	15.8	34.4	58.1
	Female	0.1	0.2	1.6	7.2	19.0	40.3	67.6	84.0

Source: Calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population, Table 57.

TABLE 56

MARITAL STATUS BY ~~URBAN~~-RURAL AND FARM - NON-FARM RESIDENTIAL GROUPS IN 1950

Four selected Corn Belt States

	% of total males over 14 years				% of total females over 14 years			
	Single	Married	Widowed	Divorced	Single	Married	Widowed	Divorced
1. **Indiana**								
Urban	22.3	70.6	4.2	2.9	18.0	65.8	12.3	3.8
Rural Non-Farm	23.5	69.4	4.9	2.1	16.3	70.1	11.6	2.0
Rural Farm	27.0	67.3	4.6	1.1	18.0	73.7	7.4	0.9
2. **Illinois**								
Urban	25.0	68.1	4.5	2.4	20.2	64.2	12.5	3.1
Rural Non-Farm	27.7	65.2	5.1	2.0	17.0	68.8	12.5	1.8
Rural Farm	28.6	66.6	3.9	0.9	18.0	74.9	6.5	0.6
3. **Iowa**	23.7	69.0	4.6	2.6	21.0	62.8	13.0	3.1
Urban								
Rural Non-Farm	24.2	68.4	5.7	1.8	17.6	66.0	14.8	1.6
Rural Farm	30.0	66.2	3.0	0.8	17.8	76.7	5.0	0.5
4. **Nebraska**								
Urban	23.8	69.4	4.5	2.3	21.3	63.4	12.4	2.9
Rural Non-Farm	27.9	64.4	5.9	1.9	18.4	65.1	14.9	1.6
Rural Farm	32.0	64.3	3.0	0.6	18.3	76.4	5.0	0.4

Source: Calculated from U.S. Bureau of the Census, Census of Population, 1950. Volume ii. *Characteristics of the Population*, Table 57.

TABLE 57

THE AGE COMPOSITION OF THE URBANISED AREAS OF THE CORN BELT, 1950

Urbanised Area	% Under 14	% 15-64	% 65 and over
Kansas City	21.7	69.6	8.7
Indianapolis	23.0	68.8	8.2
Columbus	21.4	70.2	8.4
Toledo	22.7	68.5	8.8
Dayton	24.3	68.7	7.0
Omaha	22.8	68.7	8.5
Des Moines	24.0	67.0	9.0
Rock Island - Davenport	23.0	67.7	9.3
South Bend	23.0	69.9	7.1
Peoria	23.0	68.0	8.2
Fort Wayne	23.5	68.3	8.2
Evansville	24.5	67.7	8.0
Rockford	23.5	68.1	8.4
Lincoln	20.0	69.9	10.1
Springfield (Illinois)	21.8	68.6	9.6
Sioux City	24.5	66.6	8.9
Topeka	21.9	68.0	10.1
Waterloo	24.8	67.1	8.1
Kalamazoo	22.5	68.3	9.2
St. Joseph	20.8	67.1	12.1
Springfield (Ohio)	23.5	67.1	9.4
Cedar Rapids	22.5	67.5	10.0
Terre Haute	20.8	66.7	11.3
Decatur	23.0	68.0	9.0
Hamilton	26.0	66.0	8.0

Source: Calculated from U.S. Bureau of the Census, Census of Population, 1950, Volume ii. Characteristics of the Population, Table 33.

TABLE 75

THE CHANGE IN POPULATION BY SIZE OF SETTLEMENT, 1900 - 1950

Composition of Population by Settlement Size

	1900	1910	1920	1930	1940	1950
1. **INDIANA**						
250-500,000	-	-	10.7	11.2	11.3	10.9
100-250,000	6.7	8.7	-	13.7	9.7	13.0
50-100,000	2.3	9.1	12.4	5.6	8.3	6.7
25-50,000	4.7	-	6.7	9.0	9.6	8.8
10-25,000	8.7	12.6	10.2	7.3	6.9	7.3
5-10,000	6.4	7.0	5.7	5.3	6.0	6.2
2.5-5,000	5.4	5.0	4.9	4.9	3.3	3.5
Rural Population						
1000-2,500	5.8	6.0	5.2	4.6	4.9	4.3
Under 1,000	4.7	5.1	4.9	4.8	4.5	3.8
Other Rural	55.2	46.5	39.3	35.2	35.6	35.6
2. **IOWA**						
250-500,000	-	-	-	-	-	-
100-250,000	-	-	5.3	5.8	6.3	6.8
50-100,000	2.8	3.9	5.3	7.9	10.3	11.3
25-50,000	7.0	11.0	6.5	8.5	7.7	10.3
10-25,000	5.8	6.2	8.0	6.8	6.0	5.8
5-10,000	3.2	2.7	4.8	3.8	5.9	6.9
2.5-5,000	6.9	6.9	6.5	6.8	6.4	5.8
Rural Population						
1,000-2,500	7.7	7.8	8.0	7.5	7.5	7.4
Under 1,000	10.2	12.0	11.9	11.3	11.0	10.4
Other Rural	56.4	49.7	43.7	41.6	38.7	35.2
3. **ILLINOIS**						
Over 250,000(1)	35.2	38.8	41.7	44.2	43.0	41.6
100-250,000	-	-	-	1.4	1.3	1.3
50-100,000	1.2	3.1	4.1	6.3	6.2	7.8
25-50,000	3.3	4.6	6.7	6.8	6.5	5.8
10-25,000	6.6	5.9	6.3	6.3	7.0	7.9
5-10,000	3.8	5.1	5.0	5.2	5.6	6.4
2.5-5,000	4.1	4.3	4.2	3.6	3.9	3.8
Rural Population						
1,000-2,500	6.5	6.2	5.4	4.3	4.3	4.0
Under 1,000	6.1	5.8	5.1	4.2	4.1	3.6
Other Rural	33.2	26.3	21.6	17.6	18.0	18.0

(1) This is Chicago, outside the present Corn Belt.

CONTINUED:::::::::: **TABLE 75**

	1900	1910	1920	1930	1940	1950
4. NEBRASKA						
250-500,000	-	-	-	-	-	18.9
100-250,000	9.6	10.4	14.8	15.5	17.0	-
50-100,000	-	-	4.2	5.5	6.2	7.5
25-50,000	6.2	5.9	-	-	-	-
10-25,000	-	0.9	2.8	5.7	7.0	9.1
5-10,000	4.5	5.2	5.0	4.5	4.2	4.6
2.5-5,000	3.4	3.7	4.4	4.1	4.7	5.6
Rural Population						
1,000-2,500	6.1	8.0	9.0	7.8	8.1	8.3
Under 1,000	11.6	12.4	12.3	11.8	12.0	10.5
Other Rural	58.6	53.5	47.5	45.1	40.9	35.4

Source: U.S. Bureau of the Census, Census of Population, 1950, Vol.ii. Characteristics of the Population, Table 3.

TABLE 76

POPULATION GROWTH IN THE STANDARD METROPOLITAN AREAS OF THE CORN BELT, 1940-1950

Comparison of Reproductive Change and Net Migration

Standard Metropolitan Area	Reproductive Change	Net Migration	Total Change	% Change Central City	% Change Metropolitan Ring
Kansas City	9.7	8.4	18.1	14.4	24.4
Indianapolis	11.4	7.6	19.0	10.4	68.5
Columbus	10.3	14.3	24.6	22.8	54.3
Dayton	14.0	21.0	35.0	15.7	77.0
Toledo	9.6	3.6	13.2	7.5	48.3
Omaha	11.1	1.0	12.1	12.2	13.8
Peoria	10.7	7.3	17.0	6.4	30.0
Davenport-Rock Island-Moline	10.8	6.9	17.7	12.0	34.7
Des Moines	11.1	3.8	14.9	11.4	33.4
South Bend	13.4	10.1	23.5	14.5	47.2
Fort Wayne	12.7	5.5	18.2	12.8	36.6
Evansville	11.6	10.3	21.9	-5.7	32.5
Rockford	13.0	11.7	24.7	9.8	62.7
Hamilton-Middletown	13.2	5.6	18.8	12.0	44.5
Springfield, Illinois	8.8	3.0	11.8	8.1	17.7
Kalamazoo	11.2	11.3	22.5	6.7	50.0
Lincoln	9.1	3.6	12.7	20.6	12.1
Springfield, Ohio	11.1	4.4	15.5	11.1	32.7
Topeka	8.4	7.5	15.9	16.2	13.7
Terre Haute	7.1	-3.1	4.0	2.4	10.6
Cedar Rapids	10.6	6.2	16.8	16.4	18.3
Sioux City	12.4	-11.6	0.8	2.0	-6.3
Waterloo	14.2	7.2	21.8	26.0	25.0

Source: Bogue, D.J. "Components of Population Change, 1940-1950", Scripps Foundation Studies in Population Distribution, No.12. 1957, Tables 1 and 2. Miami University, Oxford, Ohio, 1957.

TABLE 79

THE POPULATION OF THE URBANISED AREAS, 1950

Urbanised Area	Total Population	Central City	Fringe	% in Central City
Kansas City	698,350	456,622	241,728	65.3
Indianapolis	502,375	427,173	75,202	85.0
Columbus	437,707	375,901	61,806	85.5
Toledo	364,344	303,616	60,728	83.3
Dayton	346,864	243,872	102,992	70.3
Omaha	310,291	251,117	59,174	80.9
Des Moines	199,925	177,965	21,969	89.0
Davenport-Rock Island -Moline	194,925	160,656	34,269	82.4
South Bend	168,165	115,911	52,254	68.9
Peoria	154,539	111,856	42,683	72.3
Fort Wayne	140,314	133,607	6,707	95.2
Evansville	137,573	128,636	8,937	93.5
Rockford	122,226	92,927	29,299	76.0
Lincoln	99,509	98,884	625	99.3
Springfield (Ill.)	97,371	81,628	15,743	83.8
Sioux City	90,101	83,991	6,110	93.2
Topeka	89,104	78,791	10,113	88.4
Waterloo	84,386	65,198	19,188	77.2
Kalamazoo	83,332	57,704	25,628	69.2
St. Joseph	82,290	78,588	3,702	95.5
Springfield (Ohio)	82,284	78,508	3,776	95.4
Cedar Rapids	78,212	72,296	5,916	92.4
Terre Haute	78,028	64,214	13,814	82.2
Decatur	73,713	66,269	7,444	89.9
Hamilton	63,270	57,951	5,319	91.5
TOTAL CORN BELT	4,779,187	3,863,861	915,326	80.8

Source: U.S. Bureau of the Census, Census of Population, 1950 Vol. 2. Characteristics of the Population, Table 9.

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E.G.	Economic Geography.
P.I.A.S.	Proceedings of the Indiana Academy of Science.
S.F.R.P.	Scripps Foundation for Research in Population Distribution.
A.A.A.G.	Annals of the Association of American Geographers.
G.R.	Geographical Review.
G.	Geography.

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