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J. H. LONGWELL, *Director*

The Rural Population Resources of Missouri

C. E. LIVELY and MARGARET L. BRIGHT

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SUMMARY

The population of Missouri is a resource that in the course of time may vary both in size and quality. Changes in birth and death rates affect the size while social and economic conditions affect the quality. This bulletin is concerned with certain changes and trends which affect both the size and the quality of the rural population.

The rural population of Missouri reached its maximum size about 1900. Decline in number of persons since that time has been related to the reorganization of agriculture and other rural industries of the State. The rural population, and particularly the rural-farm population, shows a rate of increase considerably above that necessary to maintain a stationary rural population. Intercounty variation is marked, the highest rates of increase being located in the southeast portion of the State.

During the years of industrial prosperity before 1930, emigration from the rural districts tended to relieve the threatened population pressure resulting from a high rate of natural increase. Between 1930-1940, the decline in urban prosperity reduced those losses, particularly in the less favored areas of the State. Since 1940 migration from rural areas has more than compensated for the gain accruing through natural increase.

Because of its relatively high rate of natural increase, the farm population produces more potential workers than can be absorbed by agriculture without expanding the manpower of the industry. The proportion of farm-reared males aged 20 years that can be absorbed during the decade, 1940-1950, varies from 60 per cent in the best farming areas of the northwest to 39 per cent in the poorest Ozark areas and 35 per cent in the southeast lowland area. Because of this situation, some differentiation in educational policies is suggested.

With the approach of a stationary population and the increased mechanization of productive processes, interest in mere numbers is likely to decline. In the future, interest may center about the problem of obtaining a better relationship between population and opportunity and the problem of improving the quality of the population. An examination of such factors as the ratio of rural population to land area, the per capita value of farm products produced, the level of living of the rural population, the incidence of dependency in the rural population, the educational attainment of the adult rural population, and the proportion of rural children attending school, leads to the conclusion that the opportunities for the development of the capacities and abilities of the rural population of Missouri are very unequally distributed. Although variation in opportunity for population development is obviously related to variation in economic status, it is apparent that improvement of such opportunity is not wholly dependent upon the improvement of economic conditions.

The Rural Population Resources of Missouri

C. E. LIVELY and MARGARET L. BRIGHT

I. INTRODUCTION

The population of a state may be regarded as a precious resource, varying from time to time in size and quality because of the vicissitudes of nature and of man. Nature may provide a rich environment for the growth of population or she may set definite limits beyond which population may not grow without courting disaster. By means of invention, man increases his productive capacity and thereby provides for the support of a larger population. By changing the birth and death rates, he profoundly affects the rate of population growth. Furthermore, he creates social conditions which in the long run influence the quality of the population.

Much has been written concerning the physical and biological resources of the State of Missouri. Such writings deal with the nature and distribution of these resources and the problems associated with their development and conservation. In like manner, we may consider the population of Missouri from the viewpoints of the distribution and activities of present numbers, probable future changes in the number and distribution of the people, the conditions under which population is being produced, and the problems associated with their development. In the following pages certain current knowledge regarding the rural population of Missouri, selected and presented with a view to describing briefly the human resources of the State, is presented. This bulletin represents a revision of one published under the same title in 1939 as Research Bulletin 306. Data available since 1940 are included in this revision.

II. NUMBER AND DISTRIBUTION OF THE RURAL POPULATION

On April 1, 1940 the total population of Missouri consisted of 3,784,664 persons. Of these, 51.8 per cent lived in 87 cities, i.e., in incorporated places having 2,500 or more inhabitants. An additional 10.1 per cent lived in 706 incorporated villages of less than 2,500 population, and approximately 8.6 per cent dwelt in unincorporated villages and other unincorporated territory not including farms. Approximately three-tenths (29.6 per cent) of the population of the State lived on farms in rural territory.

Although more than one-half of the population lived in cities in

TABLE 1. POPULATION OF MISSOURI, URBAN AND RURAL:
1890 to 1940

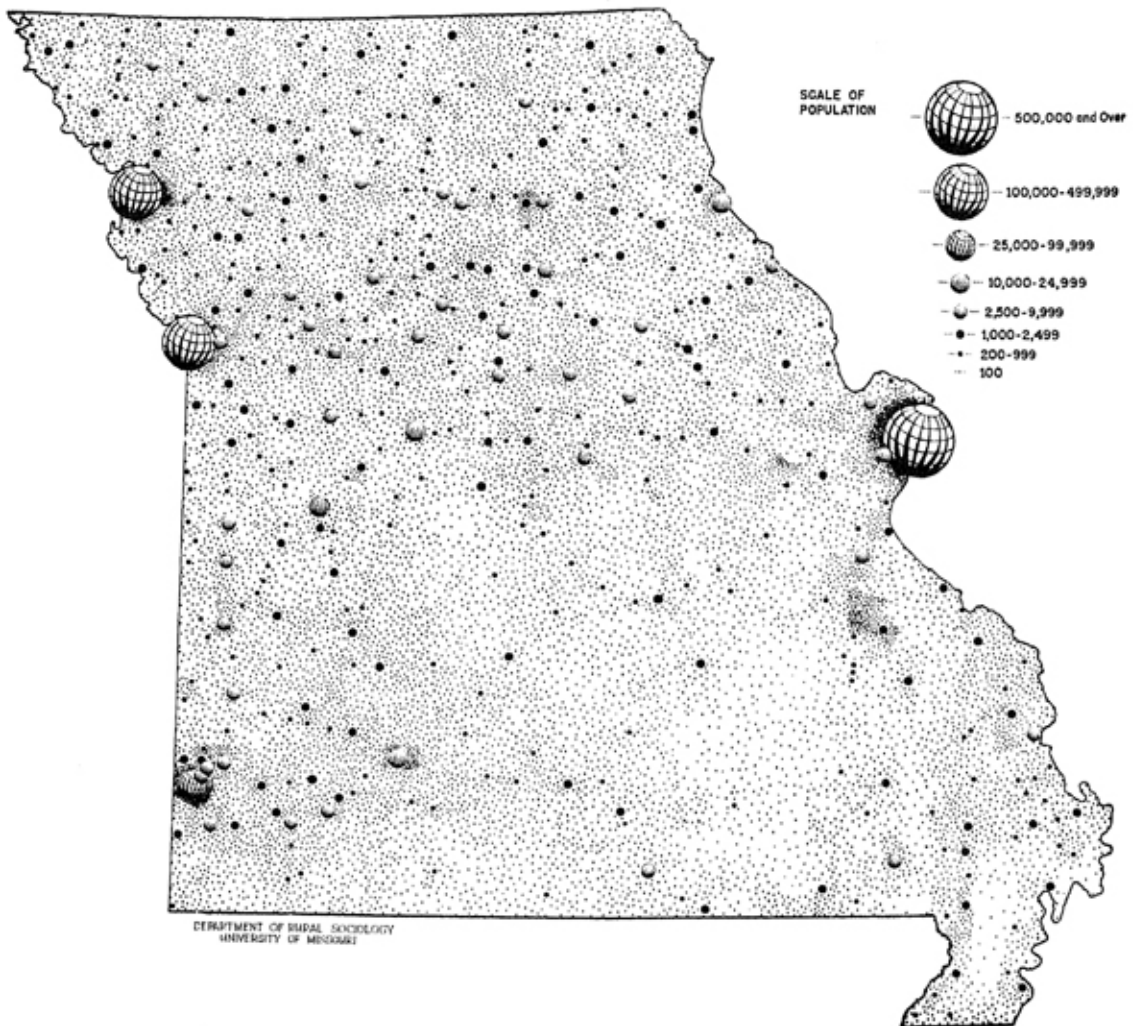
Class	1940	1930	1910	1890
TOTAL	3,784,664	3,629,367	3,293,355	2,679,185
Urban	1,960,696	1,859,119	1,398,817	856,966
Rural	1,823,968	1,770,248	1,894,518	1,822,219
Rural-farm	1,118,644	1,108,969
Rural-nonfarm	705,324	661,279
Per cent urban	51.8	51.2	42.5	32.0
Per cent rural	48.2	48.8	57.5	68.0
Per cent rural-farm	29.6	30.6
Per cent rural-nonfarm	18.6	18.2

Source: U.S. Census of Population

1940, from a geographic viewpoint the urban population was highly concentrated. Approximately three-fifths of the urban, and one-third of the total population lived in Kansas City and St. Louis. Most of the counties of the State may be termed rural. In 1940, a total of 57 counties had no incorporated place with a population as large as 2,500. In 46 additional counties more than half of the population was classified as rural. In only eleven counties was more than half of the total population living in urban centers. (Cf. Maps 1, 2 and 3.)

In 1940 the rural population of Missouri was distributed over the State in a fairly even manner. There were notable concentrations in the neighborhood of cities and in the southeast lowland region. Less than average density of rural population occurred throughout the south-central and southeast central Ozark area, but variations were not great. The average density of rural population in 1940 was 26.3 persons per square mile. Only 11 counties had a density of 40 or more persons per square mile. Five of these—Dunklin, Mississippi, New Madrid, Pemiscot, and Scott—are located in the southeast lowlands; five more—Buchanan, Clay, Greene, Jackson and St. Louis are located in the neighborhood of large cities; St. Francois has considerable mining population classified as rural. At the other extreme, only seven counties had a rural population density of less than 15 persons per square mile. These are all located in the southern half of the State. Five counties—Carter, Dent, Madison, Reynolds, and Shannon—lie in the southeastern Ozark area; Camden contains much of the Lake of the Ozarks.

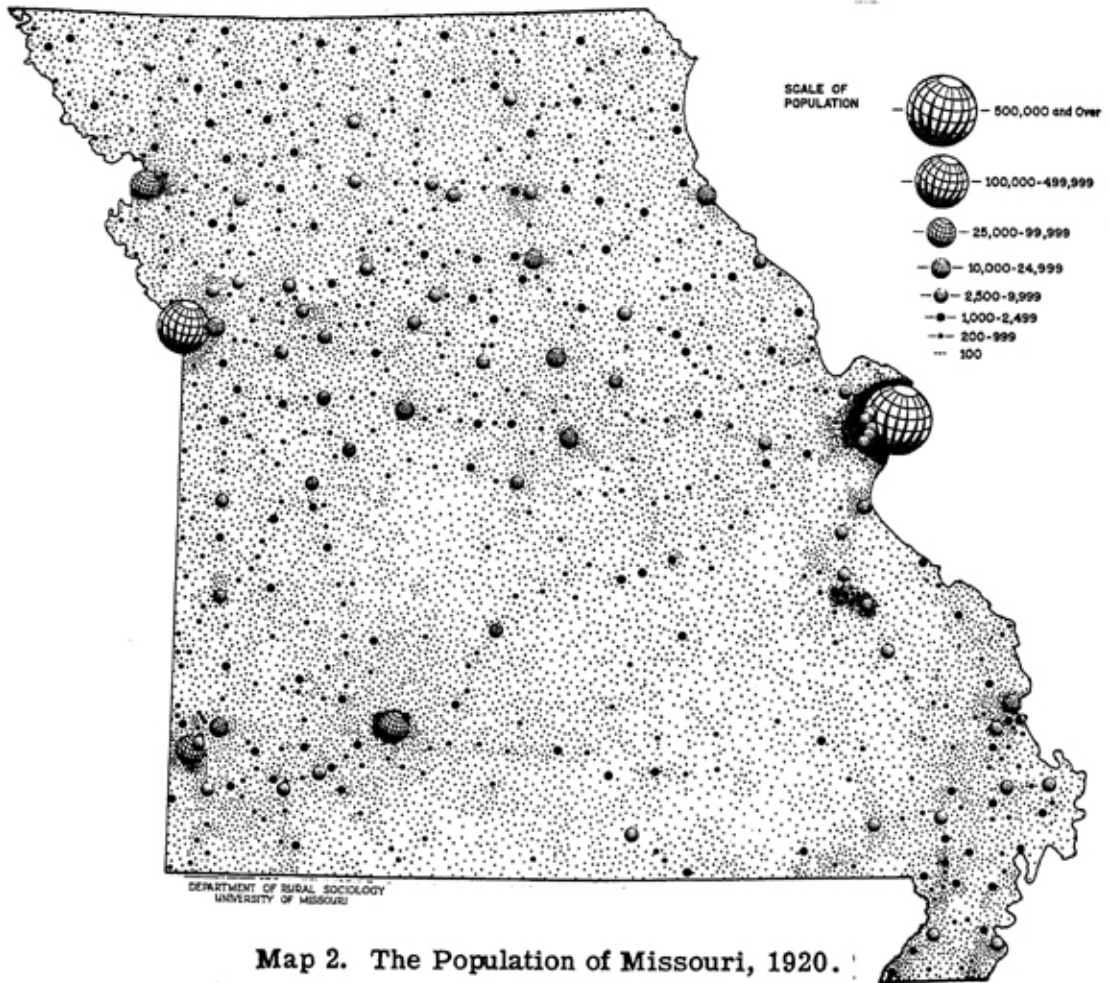
The rural-farm population was also fairly well distributed over the State in 1940. Only four counties—Dunklin, New Madrid, Pemiscot and Stoddard—contained as much as 2 per cent or more of the total rural-farm population. All these counties are located in Southeast Missouri, the area of the most rapid growth of rural-farm population in recent years. Thirty counties with one per cent or more each of



Map 1. The Population of Missouri, 1900.

the total rural-farm population were well scattered, but only four were located north of the Missouri River. Only seven counties had less than 0.5 per cent of the rural-farm population. They were Carter, Hickory, Madison, Schuyler, Scotland, Warren, and Worth. All were relatively small counties. Except for heavy concentrations in the neighborhood of St. Louis and Kansas City, the rural-nonfarm population showed a definite tendency to distribute itself in a manner similar to that of the rural-farm population. (See Maps 3 and 4.)

Trends in Number and Distribution.—From the beginning of the 19th century, the population of Missouri grew rapidly. By 1900 the rural population had reached a maximum of 1,978,561 persons, but declined steadily thereafter to 1930. Between 1930-1940, however, the rural population increased 3 per cent, constituting 1,823,968 persons in 1940. During this decade the rural-nonfarm population increased 6.7 per cent, and the rural-farm population increased slightly



Map 2. The Population of Missouri, 1920.

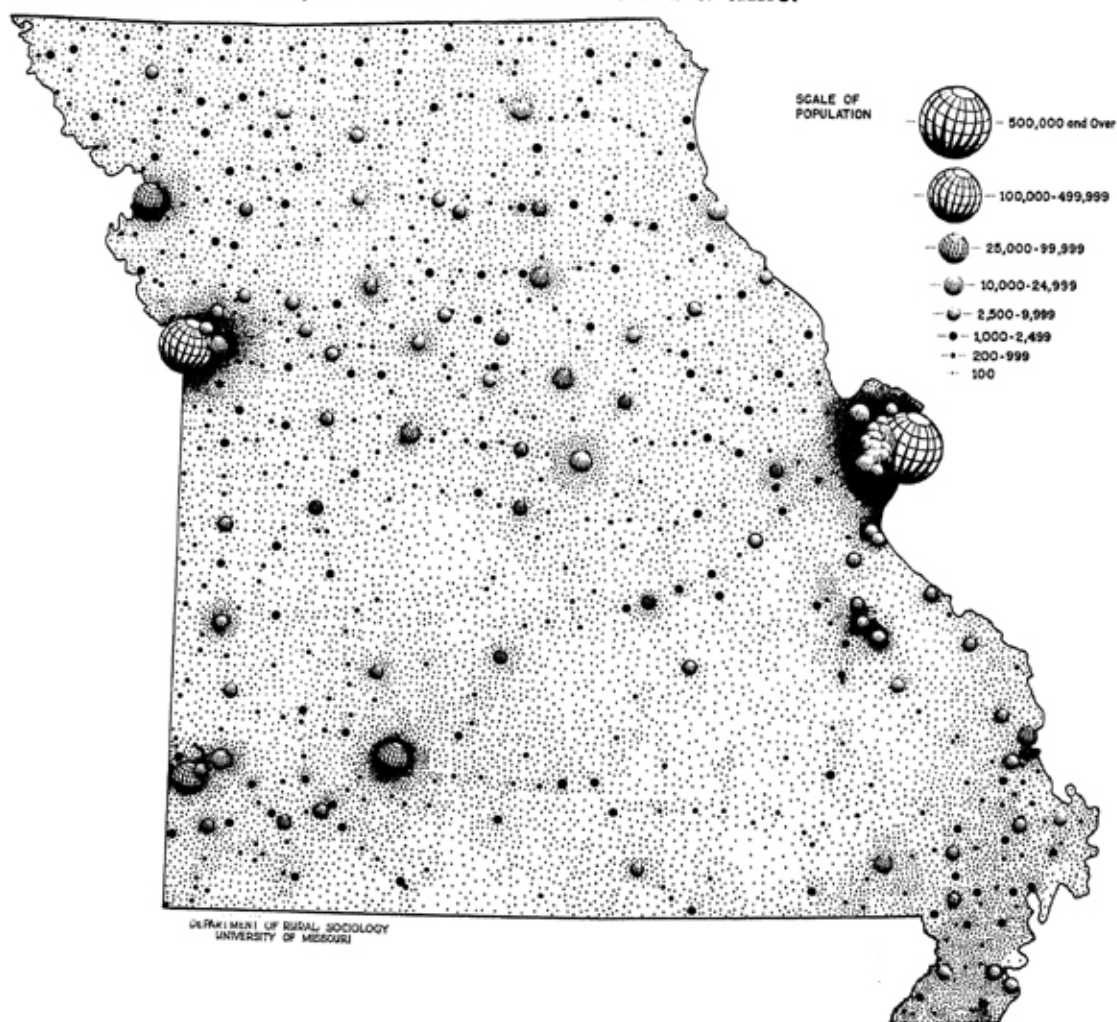
less than one per cent. All evidence indicates that a considerable decline in rural population has occurred since 1940.

Although the total rural population of the State reached its maximum about 1900, there was considerable variation from this date among the respective counties. Franklin and Marion counties passed the maximum with respect to rural population about 30 years earlier. In the Census of 1880, 13 counties were credited with a larger rural population than at any census thereafter. The Census of 1890 added to the list, making a total of 30 counties that attained their maximum rural population during 1890 or before. With the exception of Barry, none of these counties was located in the Ozark area. Most of them were located in the Missouri River Valley, the section of the State that was first settled.

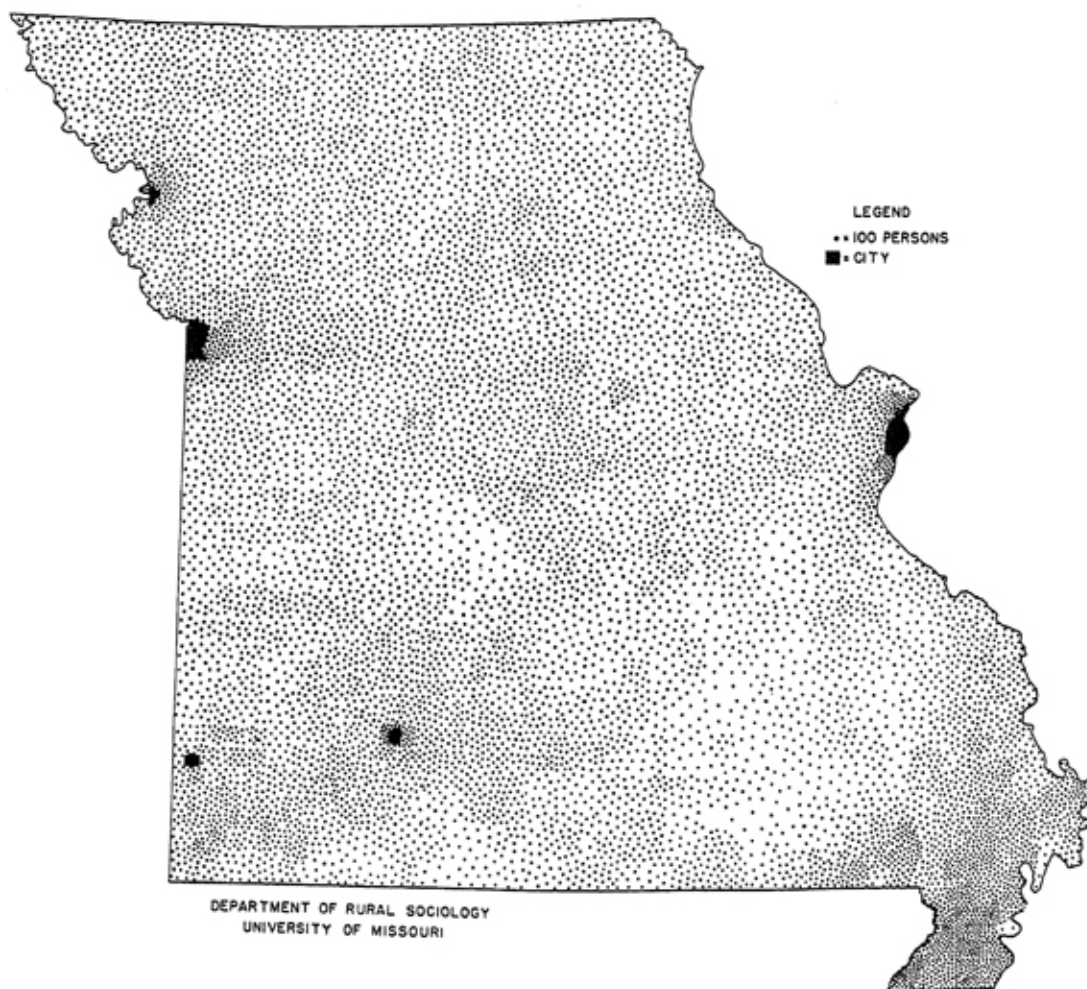
Up to 1900, a total of 38 counties had not attained their maximum rural population as indicated by later censuses. By 1910, eighteen of these had reached their maximum, four others passed that point in 1920, and two were added in 1930. Fourteen counties returned a

larger rural population in the Census of 1940 than in any previous census. These were Butler, Clay, Dunklin, Iron, McDonald, Jackson, Mississippi, New Madrid, Pemiscot, St. Louis, Scott, Stoddard, Taney and Washington. It is possible that some of these counties have not yet attained their maximum rural population.

The decline of rural population in Missouri has been one aspect of change incident to the changing pattern of agriculture and other rural industries in the State. In this process, the older counties changed first. The counties in which the rural population was greatest in 1920 or later are located mostly in the southeast Ozark and the southeast lowland areas. This territory was settled at a relatively late date. The southeast lowlands include much excellent farm land, and the birth rate is high. It is possible that the rural population of these counties may continue to increase for a time.



Map 3. The Population of Missouri, 1940.



Map 4. The Farm Population of Missouri, 1940.

The population in urban places has increased steadily during each decade. In 1900 only 36.3 per cent of the population lived in places of 2,500 or more persons. By 1940 over half was so classified. At each census since 1840 the rate of growth of urban places has exceeded that in rural territory.

The rural-nonfarm population has shown a steady increase since the first count in 1920, and had undoubtedly been increasing prior to that time. Since 1920, however, the population living in unincorporated places has increased while the population living in incorporated places of less than 2,500 population has decreased. In 1920 only 36 per cent of the rural-nonfarm population lived in unincorporated places, while in 1940 the proportion was 46 per cent. On the other hand, while the number of incorporated villages in Missouri has continued to grow in number, the population living in such places has declined from 389,711 in 1920 to 381,211 in 1940. In 1890 there were

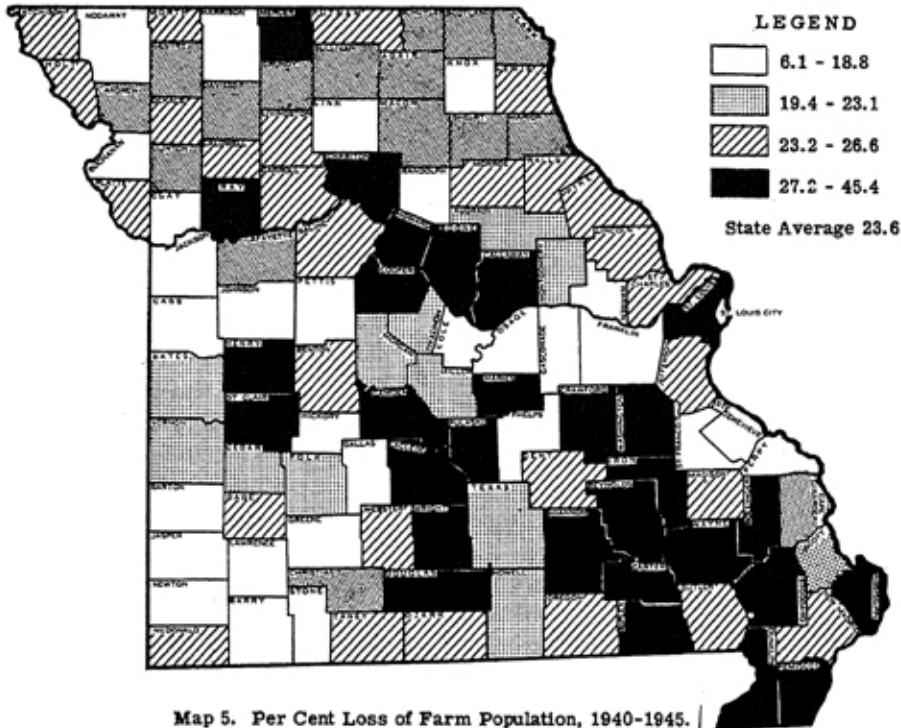
389 incorporated villages in the State, and the number increased steadily to 701 in 1940. Since 1900, however, the rate of increase in the number of incorporated villages has declined. Incorporated villages under 500 population have gained in relative importance, in 1940 constituting approximately two-thirds of all incorporated villages. Incorporated villages with a population of 500-1499 persons have decreased in relative importance since 1920, while those with a population of 1500-2499 persons have changed very little in relative importance.

The slight increase in the rural-farm population which occurred between 1930 and 1940, reversing the trend in previous decades, was not uniform throughout the State. A total of 16 counties gained farm population to the extent of 10 per cent or more, while 6 counties gained 20 per cent or more. On the other hand, 18 counties lost farm population equal to 10 per cent or more. Counties experiencing increases were located chiefly in the southern half of the State, while counties losing farm population were located chiefly in the northern and western portions of the State. It is significant to note that the better agricultural counties experienced a loss in farm population during the depression. Exception is to be noted in certain counties of the southeast lowlands. On the other hand, a number of the poorer agricultural counties showed gains in farm population.

Since 1940 the farm population of Missouri has declined. The definition of farm population in the 1945 Census of Agriculture is not strictly comparable with that of the 1940 Census; it is a more restricted definition. In other words, by definition, fewer persons were included in the 1945 than in the 1940 census, which means that the decrease between 1940 and 1945 is, in part, an over-statement.¹ By this definition the farm population decreased 23.6 per cent from 1940 to 1945. Map 5 shows that the counties having the highest percentage of loss were located primarily in the southern part of the State. Jackson county had the lowest percentage, 6.1, while the rate of decrease in Wayne county was 45.4 per cent. Since 1945 there has been some increase in the farm population of the United States as a whole resulting from the return of veterans. Estimates indicate, however, that the increase in Missouri has not been great.

The size of the farm population of the future will depend upon a number of circumstances. Important among these are the rate of natural increase, the prevailing situation with respect to land use, type of farming and mechanization of agricultural processes, and the occurrence of comparative economic opportunities in agriculture elsewhere and in the non-agricultural occupations.

¹An exact measure of the degree of over-statement cannot be given at this time.



III. THE NATURAL INCREASE OF THE RURAL POPULATION

Where no migration is involved, the change in the size of a population is measured by the difference between the number of births and the number of deaths. If there are more births than deaths, the difference becomes an increase. For example, in Missouri during the year 1940, there were 68,159 births.² With an enumerated population of 3,784,664 persons in the State, the crude birth rate amounted to 18 births per thousand persons per year. During the same year the number of registered deaths was 43,777, which gave a crude death rate of 11.6 deaths per thousand persons per year. The excess of births over deaths, therefore, was equal to 24,382, and the crude rate of natural increase was 6.4. This means that for every 1000 persons in the population more than 6 persons were gained during that year by virtue of an excess of births over deaths. If this rate (0.64 per cent per year) were maintained and no loss from migration occurred, it would mean that the population would continue to grow at a substantial rate. In order to understand more fully the changes that are taking place in this respect, it is necessary to consider the trends in birth and death rates separately.

The Rural Birth Rate.—The birth rate for the United States as a

²This figure is corrected for under-registration. Of the births occurring in Missouri, in 1940, only 90.2 were registered according to a study made by the U. S. Bureau of the Census on the completeness of birth registration for that year.

TABLE 2. URBAN AND RURAL POPULATION, MISSOURI, 1810-1940

Year	Population			Per Cent of Total	
	Total-State	Urban	Rural	Urban	Rural
1940	3,784,664	1,960,696	1,823,968	51.8	48.2
1930	3,629,367	1,859,119	1,770,248	51.2	48.8
1920	3,404,055	1,586,903	1,817,152	46.6	53.4
1910	3,293,335	1,393,705	1,899,630	42.3	57.7
1900	3,106,665	1,128,104	1,978,561	36.3	63.7
1890	2,679,185	856,966	1,822,219	32.0	68.0
1880	2,168,380	545,993	1,622,387	25.2	74.8
1870	1,721,295	429,578	1,291,717	25.0	75.0
1860	1,182,012	203,487	978,525	17.2	82.8
1850	682,044	80,558	601,486	11.8	88.2
1840	383,702	16,469	367,233	4.3	95.7
1830	140,455	4,977	135,478	3.5	96.5
1820	66,586	- -	66,586	- -	100.0
1810	19,783	- -	19,783	- -	100.0

Source: U.S. Census of Population

whole had apparently been decreasing for at least a century prior to 1940. Probably the State of Missouri was no exception. But because of the increasing population, the total number of births in the State undoubtedly increased steadily until sometime after 1910. The peak year probably yielded about 80,000 births, after which a steady decline brought the number down to about 64,000 in 1933. After that date, the number increased slowly until the conditions of World War II brought a rapid increase that may result in an all-time high in total number of births. A total of 80,698 were registered in 1946. This increase in number of births since the war has been characteristic of all states, both urban and rural.

The number of children under 5 years of age per 1000 women aged 20 to 44 years is a useful measure of the fertility of a people. This ratio of children to women is called the "fertility ratio". It is not a birth rate, but is, rather, a measure of effective fertility, i.e., fertility reduced by the average mortality of children under 5 years of age. The correlation of this ratio with the actual birth rate is sufficiently high so that for ordinary purposes it may be used as a substitute when for any reason the true birth rate cannot be obtained. Table 3 shows that in 1940 the fertility ratios for the native-white population was lowest in Kansas City and St. Louis; that they were next lowest in cities of less than 100,000 population; and that they were the highest in the rural-farm population. The native-white fertility ratio was only 46 per cent as high in the urban population as in the rural-farm population. The fertility ratio of the native-white rural-nonfarm population was intermediate between that of the urban and rural-farm populations.

Between 1910 and 1940 the native-white fertility ratio in Missouri

TABLE 3. NUMBER OF NATIVE-WHITE CHILDREN UNDER 5 YEARS OF AGE PER 1,000 NATIVE-WHITE WOMEN AGED 20-44 YEARS BY AREA OF RESIDENCE, 1910, 1930 AND 1940 ^(a)

Area of Residence	1940	1930	1910
Missouri	417	468	604
Cities 100,000 and over	276	306	345
Kansas City	265	280	303
St. Louis	282	319	362
Cities 25,000-100,000	313	352	435
Cities 10,000-25,000	308	387	475
Cities 2,500-10,000	366	424	499
Urban	298	334	388
Rural	573	641	787
Nonfarm	486	564	- -
Farm	639	696	- -

(a) Data for 1910 and 1930 from Natural Resources Committee, Population Statistics, I, National Data, Washington, D. C., 1937, p. 45. Data for 1940 computed from 16th Census of the United States.

declined from 604 to 417, a decrease of 31 per cent. The decline has been greater in rural areas than in urban areas, although the rate has remained over twice as high in the rural-farm areas as in the urban. The native-white fertility ratio declined 23.2 per cent for the urban population and 27.2 per cent for the rural population. A substantial decline in the fertility of both the rural-farm and rural-nonfarm populations has occurred since 1920. In the single decade, 1930-1940, the fertility ratio decreased 8.4 per cent in the rural-farm, and 14.5 in the rural-nonfarm population.

In 1940 the fertility ratio of the total Negro population of Missouri was only 88 per cent as great as that of the total native-white, amounting to 366. This is largely accounted for by the fact that 78 per cent of the Negroes resided in urban areas where fertility ratios tend to be low.

When considered separately, the rural Negro population had a fertility ratio considerably above that found among rural native-whites. And whereas the fertility ratio of the rural native-white population declined between 1930 and 1940, it increased 4.8 per cent among rural Negroes. The rural Negro population is concentrated in the southeast lowland counties where the ratio of children under 5 years to women of childbearing age is extremely high among whites also.

By the use of life tables it is possible to obtain the number of children under 5 years of age that is necessary at prevailing death rates to maintain a stationary population. Dividing the fertility ratio by this replacement figure, it is possible to obtain a replacement index. Table 4 shows the replacement indices for the native-white population

TABLE 4. REPLACEMENT INDICES FOR NATIVE-WHITE POPULATION OF MISSOURI, 1920, 1930, and 1940, BY AREA OF RESIDENCE (a)

Area of Residence	1940	1930	1920
Missouri	0.97	1.05	1.13
Cities 100,000 and over	0.64	0.69	0.67
Kansas City	0.61	0.63	0.65
St. Louis	0.65	0.72	0.68
Cities 25,000-100,000	0.73	0.79	0.84
Cities 10,000-25,000	0.71	0.87	0.93
Cities 2,500-10,000	0.85	0.95	1.00
Urban	0.69	0.75	0.75
Rural	1.33	1.44	1.52
Nonfarm	1.13	1.27	1.33
Farm	1.48	1.57	1.62

(a) Replacement Indices for 1920 and 1930 from Thompson, W.S., Population Index, 4 (4), October, 1938, p. 270. Indices for 1940 computed.

as of 1940.³ Since an index of 1.0 indicates a stationary farm population, it will be seen from the table that under conditions of 1940, the population of Missouri was producing only 97 per cent of the number of children required to maintain permanently a stationary population.⁴

Although the rural-nonfarm population was more than reproducing itself and the rural-farm population was producing 48 per cent more children than necessary to maintain a stationary population, the urban population had a 31 per cent deficit. Thus, if the fertility rates of 1940 were maintained and no migration into or out of the State occurred, in the course of time the surplus of births over deaths would disappear and the population of the State as a whole would scarcely be able to maintain itself. Actually, many Missouri-born persons migrate to other states, while many persons born in other states move into Missouri. For some time, however, the tendency has been for the number of persons who leave the State to exceed the number who enter it. The effect of this interchange of population upon fertility is at present unknown.

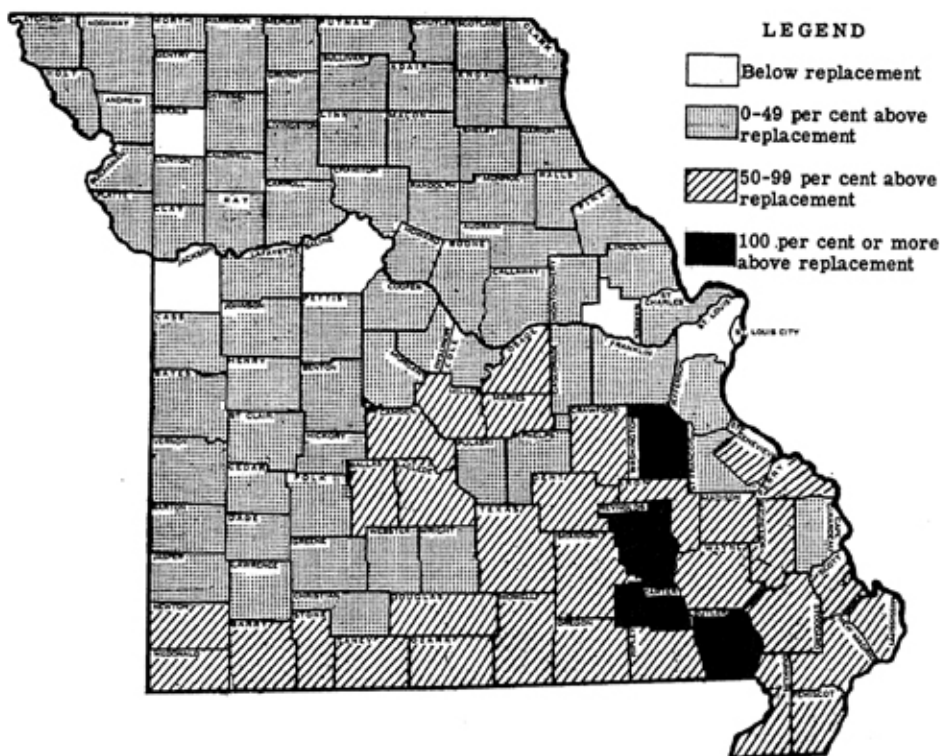
If the birth rate continues to decline, it will eventually be necessary either to retain a higher percentage of native-born persons within the State or to import a larger number from without if the size of the population is to be maintained. On the other hand, the birth rate of the rural population, and particularly of the rural-farm population, is still considerably higher than necessary to maintain a stationary population. If the farms, and rural districts generally, do not export population to the cities, or elsewhere, the rural areas may easily become overcrowded, thus reducing whatever economic opportunity now occurs in these areas.

³ Negroes omitted since they constitute only about 3 per cent of the rural population.

⁴ This statement is not in conflict with the fact that a surplus of births over deaths still existed. This surplus was the result of a favorable age distribution of the population.

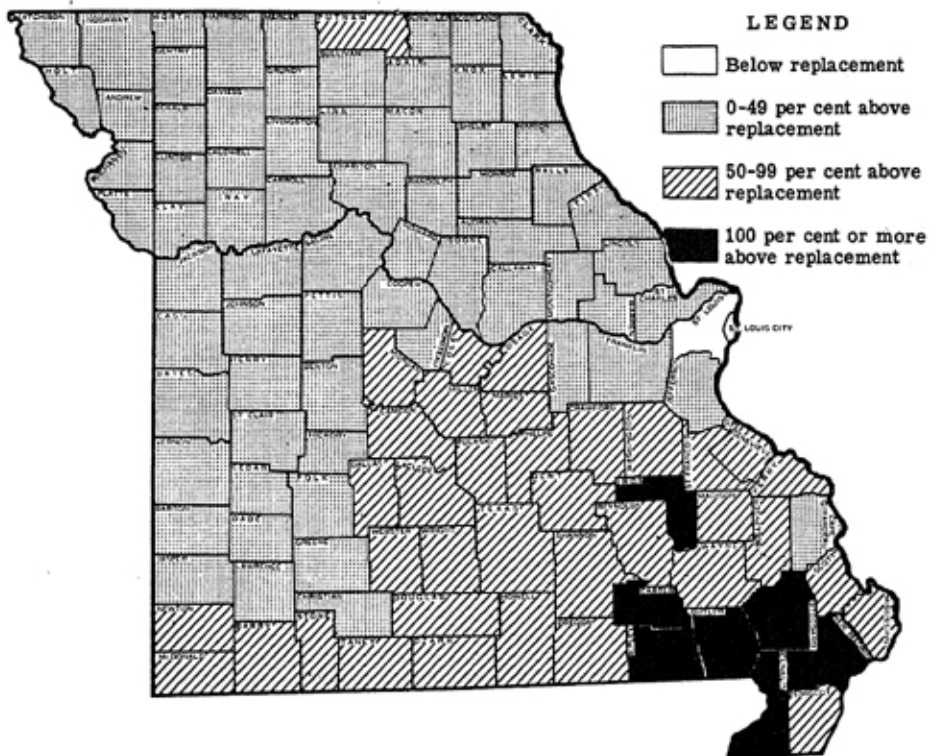
When the geography of rural reproduction is considered, it is evident that the birth rate is by no means uniform throughout Missouri. Map 6 shows the fertility ratio, by counties, for the rural population as of 1940. It is evident from this map that the highest rates of reproduction are to be found in the southern and southeastern sections of the State, and the lowest rates in the northern and western sections. So great is the variation that the counties of Carter, Butler and Washington had fertility ratios in 1940 that were more than twice as high as those prevailing in Jackson, St. Louis, DeKalb, Saline and Warren.

Since the map is shaded to indicate the relation of the prevailing fertility ratio to that required to maintain a stationary population, it may be seen that, in 1940, five counties (Jackson, DeKalb, Saline, Warren and St. Louis) were not producing sufficient children to maintain the rural population.⁵ A total of 73 counties were producing a surplus of something less than 50 per cent. These counties with few exceptions are located in the northern and western portions of the State. An additional 33 counties, in the southern and southeastern



Map 6. Number of children under 5 Years of Age per 1,000 Women Aged 20-44 Years, Total Rural Population, by counties, 1940.

⁵In the calculations the number of children under 5 years per 1000 women aged 20-44 years required to maintain a stationary population is taken to be 431.



Map 7. Number of Children Under 5 Years of Age Per 1,000 Women Aged 20-44 Years, Rural-Farm Population, by Counties, 1940.

sections, were producing from 50 to 99 per cent more children than needed to maintain a stationary population. Finally, four counties (Carter, Butler, Reynolds and Washington) were producing twice as many children as were necessary to maintain the population. From the standpoint of level of living, these counties are among the poorest in the State.

Upon breaking the rural population into its components, rural-farm and rural-nonfarm, it becomes evident that although the fertility ratios of these two classes of rural population are correlated, the former is consistently higher than the latter. In the rural-farm population, only one county, St. Louis, was failing to produce enough children to meet replacement needs. With one exception, all counties north of the Missouri River together with a number of counties south were producing fewer than 50 per cent above replacement needs. However, there were 37 counties in which the surplus ranged from 50 to 99 per cent. Also, in 7 counties, located in the Ozark highlands and the southeast lowlands, the rural-farm population was producing children at the rate of 100 per cent or more above replacement needs. (See Map 7.)

The rural-nonfarm population was failing of permanent reproduc-

tion in 35 counties in 1940. Approximately two-thirds of these counties lay north of the Missouri River. In 9 counties the surplus of children ranged from 50 to 99 per cent, and in four (Dent, Madison, Reynolds, and Washington) the surplus was equal to 100 per cent or more. Thus, it is evident that although a considerable surplus of births over deaths occurred in Missouri in 1940, the rate at which children were being produced was scarcely sufficient to maintain the population at a stationary level. Following 1940 the number of births increased sharply and as late as 1946 the number was well above the pre-war figure. This rise in number of births probably should not be interpreted as a permanent change, however. During the same period a sharp increase in the number of marriages occurred, and more marriages means more children. The increased number of marriages was apparently the result of two factors, chiefly: the realization of many marriages delayed during the war, and the earlier marriages of many due to prosperous conditions following the war. Until proof is forthcoming, it must be assumed that a gradual return to the reproductive performance of pre-war days will occur.

The Rural Death Rate.—The crude death rate for the State of Missouri has remained relatively constant for upwards of 20 years, amounting to 12.5 in 1920, 11.8 in 1930 and 11.6 in 1940. Although the average expectancy of life at birth has increased significantly during this time, the growing population in the older age groups where mortality rates show less variation has tended to offset this gain. Table 5 shows that the gain in expectancy of life during the two decades accrued almost wholly to persons under 45 years of age. Between 1920 and 1930, the specific death rates for all age groups under 45 fell from 50 to 65 per cent. Since 1940, infant mortality has declined to approxi-

TABLE 5. NUMBER OF DEATHS, AND DEATH RATES ^(a), BY AGE, MISSOURI, 1920, 1930, and 1940

Age	1940		1930		1920	
	Number of Deaths	Death Rate	Number of Deaths	Death Rate	Number of Deaths	Death Rate
Total	43,777	11.6	43,099	11.9	42,638	12.5
Under 1 year	2,885	53.0	3,645	62.5	5,309	84.7
1-4 years	725	3.2	1,408	5.7	2,755	10.4
5-14 years	579	1.0	1,200	1.8	1,917	2.8
15-24 years	1,205	1.9	2,099	3.3	2,989	5.0
25-44 years	4,319	3.8	5,734	5.4	7,492	7.4
45-64 years	11,503	14.2	11,367	16.2	9,105	15.1
65 yrs. & over	22,551	69.2	17,523	71.7	12,948	69.8

(a) Number per 1,000 enumerated population

Source: U.S. Bureau of Census, Vital Statistics, Special Reports, Vol. 20, No. 26, Missouri, February 18, 1944.

TABLE 6. AGE-ADJUSTED DEATH RATES BY URBAN AND RURAL AND BY RACE, MISSOURI, 1940

Type of Residence	Total	White	Non-White
Total	10.1	9.6	17.3
Urban-total	11.5	10.7	18.4
100,000 Population or more	11.5	10.5	18.3
10,000 to 99,999 Population	11.0	10.7	17.7
2,500 to 9,999 Population	11.8	11.4	18.6
Rural	8.6	8.5	13.8

Source: Bureau of Census, Vital Statistics - Special Reports, Vol. 23, No. 1, p. 23.

mately one-third of the 1920 rate. This is the lowest infant mortality ever recorded in Missouri.

When comparing the death rates of rural and urban populations, it is necessary to adjust for differences in age. Table 6 shows what the rural and urban death rates would be in Missouri if both populations had the age distribution of the total population of the United States in 1940. It is clear that when adjusted for age differences, both whites and non-whites in rural Missouri had a considerably lower death rate than the rest of the State.⁶ With proper medical and health facilities, rural death rates could be lowered still further.

IV. MIGRATION

Both the size and quality of a population may be affected by migration. If more people leave the State than move into it, the size of the population is reduced to the extent of the difference. Conversely, if more people move into the State than move out of it, the size of the population is increased by the amount of the excess.

People are constantly moving to and from the rural districts. During periods of war and economic prosperity, the number of people so moving tends to increase, and during periods of economic depression the number tends to decrease. Still, the interchange does not stop altogether.

During a given period of time, the difference between the inflow and the outflow of migration may be called "net migration", or the net result of migration. In the past, the rural districts have customarily experienced a net loss of population as a result of migration. This means that during a given time period the number of people moving from farms and villages to towns and cities has exceeded the number moving from towns and cities to farms and villages.

The extent of net rural migration in Missouri before 1920 is not known. Because of inadequate data, it is not possible to offer estimates

⁶Part of this difference may be due to under-registration of rural deaths and to other factors.

of such migration. It is possible only to indicate the changes in number of persons living in rural territory, decade by decade. Although it is possible, in this manner, to infer something of the migratory trend, these data do not in any sense represent a measure of net migration. For example, counties having fewer people living in rural territory in 1920 than in 1910 undoubtedly experienced some net loss by migration during the decade. In like manner, counties returning rural population increases of 20 per cent or more between 1910 and 1920 may be regarded as having experienced more in-migration than out-migration. Beyond this little can be said.

In terms of Census enumerations, 46 counties had attained maximum rural population by 1900, and before 1910 the total rural population of the State began to decrease. During the decade, 1900-1910, a total of 82 counties decreased in rural population, giving proof of a net loss by migration. A total of 32 counties showed an increase in rural population, but only three (Dunklin, New Madrid, and Pemiscot) increased as much as 20 per cent or more.

During the subsequent decade, 1910-1920, a total of 92 counties decreased in rural population and, therefore, may be said to have experienced a net loss of rural population as a result of migration. Of the 22 counties gaining rural population, only four (Carter, Jackson, Pemiscot, and St. Louis) gained as much as 20 per cent or more.

The decade 1920-1930 was one of profound changes in the rural population of Missouri. Although an estimated decrease of 46,900 persons⁷ occurred, the net loss resulting from migration amounted to 261,900 persons. Thus, while the rural population decreased by only 2.6 per cent during the decade, the estimated net loss from migration amounted to 14.3 per cent of the rural population of 1920.⁸ The net loss to the rural population resulting from migration came chiefly from the rural-farm population. A net total of 245,300 persons left the farms during the decade. This number was equal to 20.2 per cent of the rural-farm population of 1920. On the other hand, the estimated net loss to the rural-nonfarm population amounted to only 16,600 persons. This number was equal to 2.7 per cent of the rural-nonfarm population of 1920.

Estimates of net migration by counties indicated that only 5 counties gained rural population as a net result of migration between 1920 and 1930. They were Clay, Jackson, Mississippi, Pemiscot and St. Louis. Jackson and St. Louis counties gained more than 40 per cent each, but Clay and Mississippi gained less than 10 per cent. All other

⁷Decrease in hundreds after enumerations of 1920 and 1930 were corrected for under-enumeration of children under 5 years of age.

⁸Estimates take no account of children born between 1920 and 1930.

counties, 109 in number, experienced a net loss from migration. Of these, 49 lost from 10 to 19 per cent of the 1920 rural population, 47 lost 20 to 29 per cent, 7 lost 30 per cent or more, and 6 lost less than 10 per cent. Counties with losses of less than 10 per cent were Buchanan, Cass, New Madrid, Ralls, St. Francois, and Taney. Counties with losses of 30 per cent or more were Carter, Madison, Ozark, Perry, Phelps, Reynolds, and Ste. Genevieve. Counties with losses of more than 10 per cent were concentrated in the southern half of the State.

Between 1930 and 1940 the loss of rural population through migration decreased. Increases were observed in 53 counties and losses in the remaining 61 counties. Counties losing rural population during this decade were located chiefly in the northern half of the State. Data on net-migration during the decade are available for the rural-farm population only. An estimated net total of 87,400 persons left farms during this decade.⁹

Estimates by counties indicate that 10 gained rural-farm population as a result of net migration between 1930 and 1940. Five counties gained less than 5 per cent; three gained from 5-10 per cent; Mississippi county gained 19 per cent and Butler 38 per cent. Taney county showed no gain or loss as a result of migration. All other counties, 103 in number, experienced a net loss. Of these, 39 counties lost less than 10 per cent of the 1930 rural-farm population; 58 lost 10 to 19 per cent and 6 had losses amounting to 20 per cent or more. Counties with losses of 20 per cent or more were Bates, Camden, Carroll, Harrison, Stone and Sullivan. Counties with the greatest losses were concentrated in the northern and west central sections of the State.

Estimates from the Bureau of Agricultural Economics show that 83.6 per cent of all persons migrating from farms in the decade 1930-1940 were between the ages of 15 and 30 years. Females left farms at a somewhat earlier age than males, the largest number of females migrating between the ages of 15 and 19 years and the largest number of males migrating between the ages of 20 and 24 years. Although some of these young people find their way back to farms, particularly during periods of depression, it is to be expected that the major portion of them spend their productive years away from farms.

After 1940, migration from rural areas of the State increased greatly as a result of employment opportunities in defense and industrial areas and the induction of men into the armed forces. No exact measure of this migration is available. However, as previously indicated the loss of rural-farm population, 1940-1945, was 23.6 per cent.

⁹Bernert, Eleanor H., "County Variation in the Net Migration from the Rural-Farm Population, 1930-40", Bureau of Agricultural Economics, December, 1944.

There has probably been some increase in the rural-farm population since 1945 as a result of the return of veterans, but it is impossible at this time to determine what effect this will have upon the net migration pattern of the State for the decade, 1940-1950.

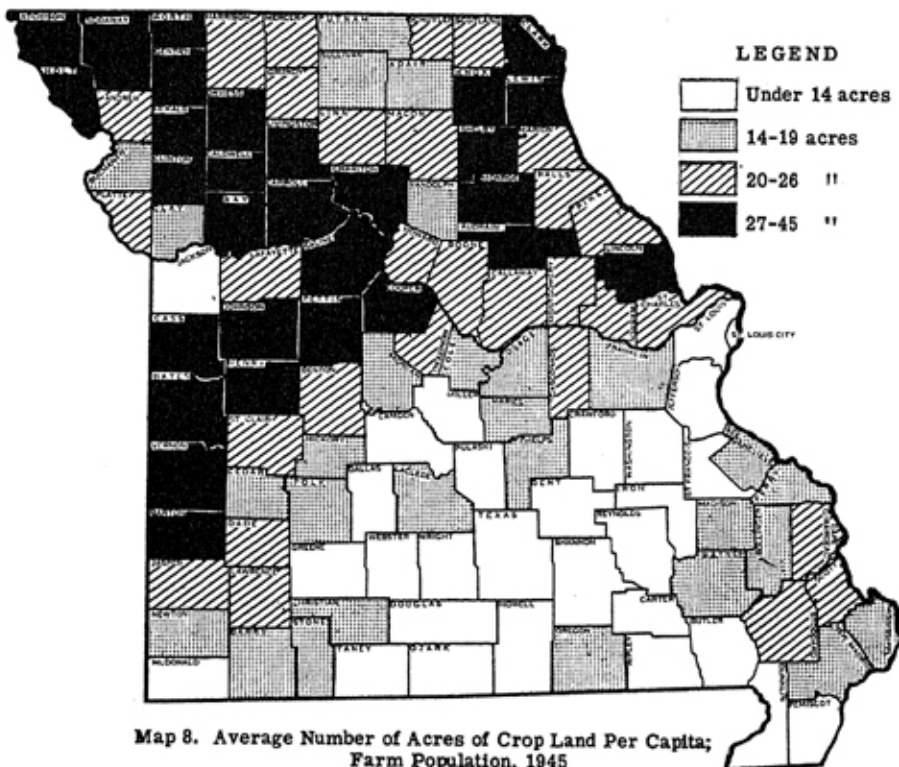
V. FACTORS CONDITIONING THE DEVELOPMENT OF RURAL POPULATION RESOURCES

It is now coming to be generally understood that the geographic pattern of agriculture which was established in pioneer days and which has been perpetuated with certain variations to the present, is in need of further modification in the interest of proper land use and soil conservation. That such adjustments in the agricultural pattern of the State as may be indicated will effect certain changes in the present pattern of rural population can scarcely be doubted. Therefore, in the following pages, attention is called to certain factors which serve to suggest needed adjustments in the interests of greater developmental opportunity and improvement of population quality.

So long as the ratio of population to arable land and other resources was low, labor was scarce, economic opportunity was widespread, and attitudes generally were favorable to an increase in population. But with the subsequent exploitation of physical resources and the development of labor-saving devices, interest in the growth of mere numbers has waned rapidly. Henceforth, interest is likely to center primarily upon the problem of obtaining a closer relationship between population and opportunity and the problem of improving further, or at least maintaining, the quality of the population.

Rural Population and Land Area.—The distribution of rural population, particularly the distribution of farm population in relation to farm land, is an important factor in population maintenance and population development since, other things equal, the land area per unit of population determines the amount of wealth and income available for the support of the people and their activities. Reference to Map 4 suggests that the farm population of Missouri is distributed rather evenly throughout the State. Computation shows, however, that in 1940 the amount of farm land per capita of the rural-farm population varied from 8.4 acres in Pemiscot county to 54.8 acres in Knox county. The state average was 31.1 acres. Because of migration, the state average had risen to 41.3 acres by 1945. Pemiscot county was still low with 12.6 acres per capita and Knox was still high with 66.2 acres per capita.

In some respects the amount of crop land available represents a still better measure of the possibilities for population support. The average number of acres of crop land per capita of the farm population



Map 8. Average Number of Acres of Crop Land Per Capita;
Farm Population, 1945

in 1945 was 19.7. It varied from 8.8 acres in St. Francois, a mining county with much part-time farming, to 45.0 acres in Atchison county. Low acreages prevailed throughout the Ozark and Southeast Missouri areas; the highest acreages occurred in the north and western portions of the State. (See Map 8.)

Value of Farm Products.—The value of the farm products produced by a people serves as a fair measure of their gross income from agriculture. When this value is reduced to a per capita basis, it removes the influence of variation in the size of the farm family. According to the 1945 Census of Agriculture, the average value per rural-farm inhabitant of farm products produced in 1944 was \$683 for the State of Missouri. Map 9 shows the average value for the respective counties. The close resemblance between Maps 8 and 9 should be noted.

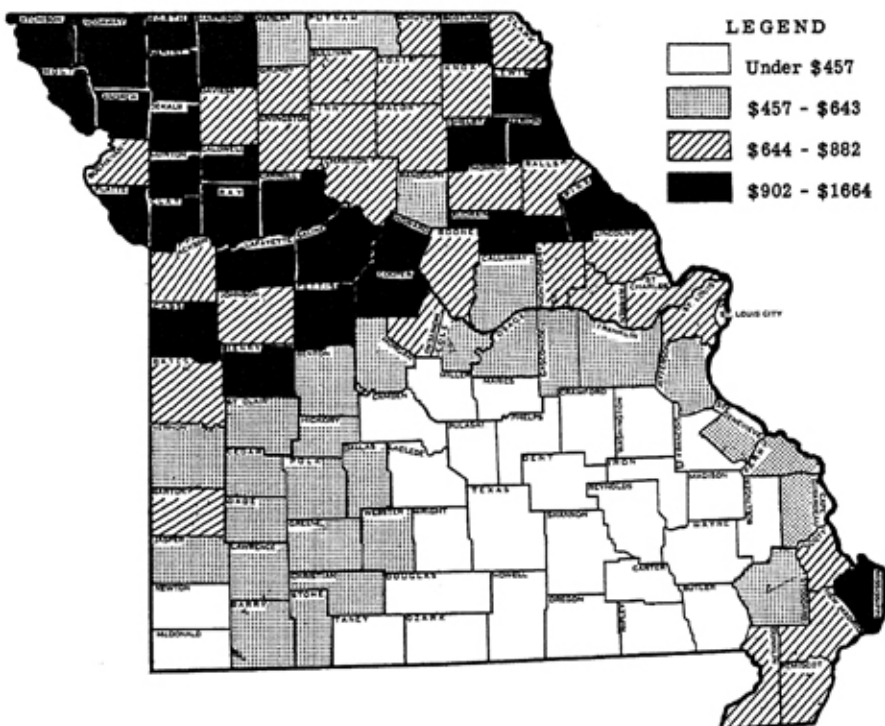
Most of the counties north of the Missouri River had per capita values of farm products above average for the State. Most of the counties in the south half of the State were below average in this respect. A total of 28 counties in the Ozark area had per capita values under \$457. A total of 8 counties (Butler, Carter, Iron, Madison, Reynolds, Ripley, Shannon and Wayne) had average values under \$300. At the other extreme, were 28 counties with average values above \$900; Atchison, Clay and Clinton had average values above \$1200.

Comparison of per capita values of farm products produced in 1939 and 1944 shows that the state average rose during the 5 years

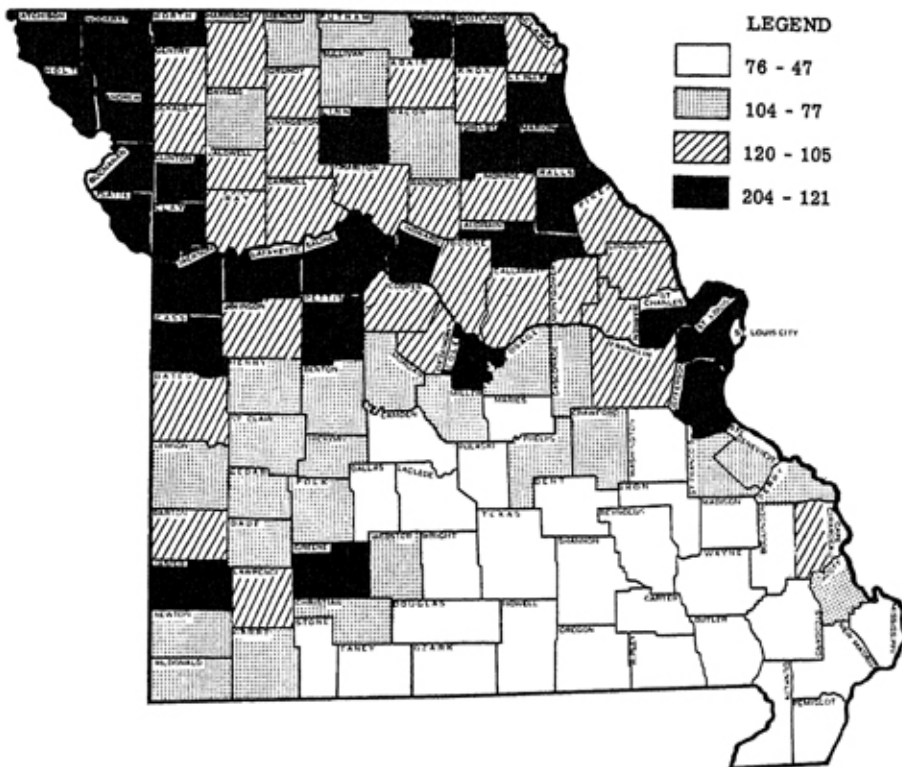
from \$234 to \$683, but the general pattern of variation among the counties was not greatly affected by this period of rising prosperity. In general, the counties that had highest per capita values of farm products produced in 1939 also had the highest per capita values in 1944. Correspondingly, most of the counties that had lowest values in 1939 also had lowest values in 1944. However, the low value counties made a considerably higher percentage gain during the 5-year period than the high value counties.

It is true that the farm operators of these low value counties supplemented their income from farm products by working, on the average, 141 days off the farm in 1939 and 166 days in 1944. However, this was only slightly greater than the number of days worked off the farm by the 25 counties having the highest per capita value of farm products. Hence, it cannot be said that in these low income counties work off the farm compensates for the low per capita value of farm products produced.

Rural-Farm Plane of Living.—The level of living of a people represents the manner in which they translate the resources of their environment, including income, into a pattern of living. In short, the term connotes how the people live. In its entirety, the mode of living of a people virtually defies accurate measurement; yet it is



Map 9. Per Capita Value of Farm Products Produced in 1944; Farm Population, 1945



Map 10. Index of Rural-Farm Plane of Living, 1940, by Counties.

possible to construct some useful measures of certain aspects of living. The indices of level of living used herein are based upon factors contained in the Federal Census of 1940.

As of 1940, the median index of the level of living of rural-farm families in Missouri was 104.5. The index ranged from 47 in Butler county to 204 in St. Louis county. All counties north of the Missouri River except five had indices equal to or above the median for the State. So, also, did 18 counties located south of the Missouri River. The lowest indices were found in the Ozark and southeast lowland counties. (See Map 10.)

As may be noted, the rural-farm level of living index displays wide variation among counties. There is a strong tendency for the higher levels of living to be found where the acreage of farm land per capita and the value of farm products per capita are also high. This is inevitably so since the level of living index used is to a considerable extent a consumption index and therefore largely dependent upon income.

The level of living of the farm population shows a tendency to be highest where the educational attainment of the adult population is highest. The level of living is also related to the prevailing birth rate as measured by the fertility ratio. The relationship is inverse, how-

ever. That is, the fertility of the farm population tends to be highest where the level of living is lowest. Conversely, where the fertility of the farm population is low, the level of living tends to be high.

Although the above measures of economic welfare are of necessity incomplete, they appear to be sufficient to warrant the conclusion that a considerable proportion of the farm population of Missouri is handicapped in the attempt to develop its capacities and abilities. Compared to other sections, it is clear that much of the farm population of southern Missouri receives incomes and maintains levels of living that are but slightly above those to be found in the poorest areas of the United States.

Rural-Nonfarm Plane of Living.—The plane of living of the rural-nonfarm population as measured by the consumption index used was related to that of the rural-farm population.¹⁰ Since the economic prosperity of the rural-nonfarm population is dependent to a high degree upon the prosperity of the farm population, what has been said above regarding the latter also applies with considerable force to the former.

Number of Dependents.—The number of dependents in a population represents a factor which strongly conditions population development. If the ratio of dependents to gainful workers is low, the total economic return per unit of population will be greater than where the ratio is high. With the economic return per gainful worker constant, an increase in proportion of dependents decreases the return per unit of population. The dependents in a population are composed chiefly of children below the age of gainful workers, and aged persons who have ceased to be gainful workers. For purposes of this discussion, such dependents are defined as persons under 15 years of age, and 65 years of age or over.

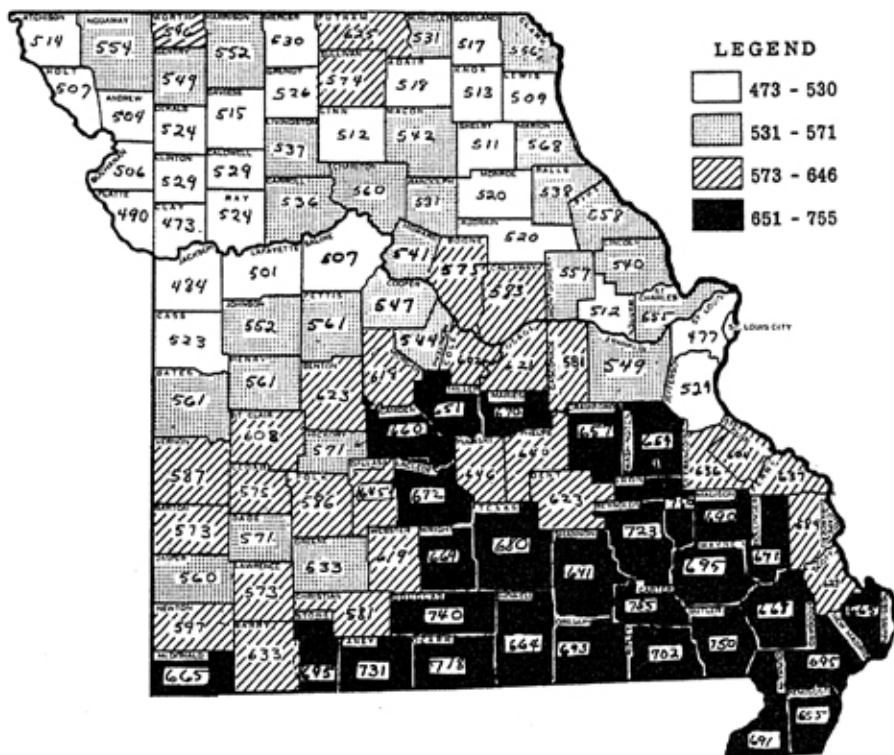
In a rapidly growing population, the proportion of children under 15 may be as high as 40 per cent or more. The proportion decreases with the rate of growth, however, until in a regressive population it may amount to 20 per cent or less. On the other hand, in a rapidly growing population, the proportion of aged people is likely to be under 5 per cent; whereas in a declining population it may be as high as 10 per cent or more. In the State of Missouri in 1940 the number of children under 15 years of age amounted to 23.8 per cent of the total population. In the rural-farm population, the corresponding percentage was 28.7, and in the rural-nonfarm population it was 25.3. In the entire population, the number of persons aged 65 or over was equal to 8.6 per cent of the total, but in the rural-farm population the corres-

¹⁰The coefficient of simple correlation when computed on a county basis was 0.78.

ponding percentage was 8.1, and in the rural-nonfarm 10.3. These figures show clearly how, at any given time, the proportion of dependents varies from one section of the population to another within the same state.

The economic burden arising from the number of dependents that must be carried by the working population may be indicated by the ratio of the number of persons dependent by age to the number of persons of gainful working age. (See Map 11.) In 1940 the number of dependents per 1000 gainful workers was 594 in the rural-farm population and 549 in the rural-nonfarm population. This difference suggests that the gainful workers in the rural-farm population may be carrying a slightly greater load of non-producers than the gainful workers in the rural-nonfarm population.

It appears, also, that the rural population as a whole is carrying a heavier load of non-producers than the remainder of the population. In 1940, in the urban population, the number of dependents per 1000 persons aged 15 to 64 years amounted to only 384. In St. Louis the corresponding number was 364, and in Kansas City 348. Even though children and aged people may be economically more useful in the rural



Map 11. Number of Dependents (persons under 15 years of age and 65 years of age and over) per 1,000 Gainful Worker Population (15-64 years of age), Rural-Farm Population, 1940.

districts than in the urban, it is doubtful whether the marked difference is thereby equalized.¹¹

Within the rural districts wide differences in the occurrence of persons dependent by age are to be found. With respect to the rural-farm population all counties north of the Missouri River, except Worth and Putnam, had fewer dependents per 1000 persons aged 15 to 64 years than the average for the rural-farm population of the State. St. Louis, Platte, Clay and Jackson counties had fewer than 500. On the other hand, nearly all counties in the Ozark area and all in the southeast lowlands had more than the average number of dependents. Eight counties (Butler, Carter, Douglas, Iron, Ozark, Reynolds, Ripley, and Taney) had more than 700 each. The same general situation prevailed in the rural-nonfarm population. Carter, Dent, Madison, Reynolds, Shannon and Washington counties each had more than 700 dependents per 1000 persons aged 15-64 years.

Education.—Schooling may be regarded as a rough index of the extent to which capacities and abilities of the population have been and are being developed. In a democratic society, it may also be regarded as a measure of the extent to which the people have been and are being prepared for democratic participation in the major affairs of society.

Two specific indices of the schooling of the rural population are now available. School attendance of children of school age has been recorded in previous censuses, but no comprehensive survey of the formal educational attainment of the rural adult population was made until 1940. These indices are not to be considered as adequate measures of the educational system of the State, since other factors are important in judging an educational system. However, such data make it possible to compare different states, different sections of the same state, and the various segments of the population within a state. Furthermore, they are useful in relation to other socio-economic factors.

In Missouri in 1940, the per cent of children of school age attending school tended to be highest in those counties where the level of educational attainment of the adult population was highest. In other words, school attendance in any area tends to reflect the educational standards prevailing in that area.

In 1940, the median years of school completed by the rural-farm population 25 years of age or over was 7.9 years, varying from 5.9 in Mississippi county to 8.6 in Jackson county. For the rural-nonfarm population the corresponding figure was 8.3, varying from 7.1 in Butler

¹¹Insofar as the support of dependent groups is placed upon a state basis, those differentials are likely to be equalized.

county to 9.2 in Atchison county. A total of 48.6 per cent of the rural-farm population, aged 25 or over, and 57.2 per cent of the rural-non-farm population had never gone beyond the eighth grade. Only 16.9 per cent of the adult rural-farm population had any high school education, while the corresponding percentage among the rural-nonfarm population was 24.8. With respect to college education only 4.5 per cent of the rural-farm and 9 per cent of the rural-nonfarm population reported any college work.

The above figures apparently reflect the traditional attitude of farm people toward schooling, namely, that an eighth grade education is sufficient for those who farm. That this attitude is changing only slowly is suggested by the fact that in 1940 all male farm youth, aged 25-29 years, had completed an average of 8.6 years as compared to 8.1 years completed by all farm males aged 60-64 years. These figures suggest that as far as the average schooling of the men who farm in Missouri is concerned, only half a year's schooling was gained during the 35 years prior to 1940.

In general, the percentage of the rural adult population of Missouri with any high school or college education is low as compared with the United States as a whole and with other north central states.¹² In the rural-farm population only three states (North Dakota, Wisconsin and Minnesota) ranked lower in this respect. In the rural-non-farm population only Illinois ranked lower.

The rank of the counties with respect to the median years of school completed is related to the value of farm products per capita and to the level of living index. That is, there is a tendency for the level of educational attainment to be higher in those counties where farm income and the level of living is also high. Also, the level of educational attainment is inversely related to population fertility. That is, in those counties where the number of children being produced is relatively high, the median years of school completed by the farm population tends to be relatively low.

No conclusions can be drawn regarding the extent to which the relatively low educational attainment of the adult rural population can be attributed to the educational systems prevailing in the various counties of the State. The proportion of rural children of school age attending school indicates the number of rural children being served by the educational facilities of the State; it does not warrant any generalization regarding the quality of the schooling they are receiving.

In 1940 only 93.5 per cent of all farm children aged 7 to 13 years were attending school, as compared with 95.9 in the rural-nonfarm

¹²Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

population, and 97.4 in the urban population. The differences in school attendance were more apparent beyond grade-school age. Only 81 per cent of the farm children aged 14 to 15 years were attending school as compared with 88.3 per cent in the rural-nonfarm population and 92.2 per cent in the urban population. Likewise, only 55.6 per cent of farm children, aged 16 to 17, were attending school, while the percentages for the rural-nonfarm and urban population were 64.5 and 67.6, respectively. Among farm youth aged 18 to 20 years, 17.9 per cent were attending school as compared with 20.4 per cent among rural-nonfarm youth and 23.4 among urban youth. These averages suggest that the capacities and abilities of farm youth which should be developed in high school and college are not receiving adequate attention.

Even more suggestive than state averages are the data showing variation among the different sections of the State. The proportion of children aged 7 to 17 years attending school in 1940 varied from 50.9 in Ozark county to 93.4 in Nodaway county. School attendance for young people aged 18 to 20 years varied from 8.4 per cent in Ste. Genevieve county to 48.5 per cent in Johnson county. Counties located north of the Missouri River and along the western border of the State had higher averages for school attendance than other counties, but a number of counties in the Ozark area had school attendance above the average for the State as a whole.

It is clear from the above data that there is need for improvement in the educational level of rural people. The present average adult level of less than a grammar school education is inadequate in view of the many and diverse problems with which rural people are confronted. The large number of children of high school age not attending school is indicative of failure to prepare the rising generation to meet problems that are almost certain to confront them in adult life. The failure of certain communities to provide adequate educational facilities rests in part upon differences in ability to support education, but also it rests upon the traditional attitude that secondary education and higher education do not constitute essential preparation for farm life.

VI. RELATION OF THE FARM-REARED POPULATION TO THE MANPOWER REQUIREMENTS OF AGRICULTURE

One of the basic elements in population support and development is occupation. Not only is it highly desirable that occupational outlets be available for all of the people, but the occupational variety should be sufficient to permit a wide range of choice according to ability and personal preference. In this manner, specialization becomes possible

and both labor and special ability are utilized to good advantage.

It is generally known that more persons are born and reared on farms than are subsequently employed in agriculture as an occupation. Either from choice or from necessity, a certain percentage of these persons find their way into non-agricultural occupations. The exact proportion that actually does this during any given period of time is not known. Obviously the percentage varies depending upon such factors as the rate of natural increase of the farm population, the outlook for expansion of the agricultural industry, the availability of the land and other capital required to begin farming and the attractiveness of opportunities in non-agricultural occupations. For several decades urban opportunity has attracted large numbers of farm youth away from the farms. At the same time, conditions apparently have made it increasingly difficult for many farm youth to enter the farming occupation with promise of success. Good farm land has become increasingly difficult to obtain at a price within their reach. In many areas, farms have become larger and the equipment necessary for farm operations has increased, making a larger investment necessary. Since it is inadvisable to divide the family-sized farm, it is seldom that more than one child can inherit the family farm with much promise of success. With the increase in the productive capacity of gainful workers in agriculture, the number of wage laborers has decreased. Thus, an increasing proportion of farm-reared youth has been deprived of either a gift of land and capital from their parents or the opportunity to climb the "agricultural ladder" by turning wage laborer.

Many considerations, both economic and social, enter into the question of how many people should live on the farms of the State and engage in the occupation of farming. It is not the purpose of this inquiry to offer any solution of that problem. Rather, the aim is to compare the number of farm-reared people, who may be regarded as potential farmers, with the current demands of agriculture for manpower. Specifically, the aim is to present estimates of the number of persons required to replace those gainful workers who are lost to the agricultural industry through death or retirement. In order to do this, the decade 1940-1950 is chosen, and it is assumed that the number of persons employed or seeking work in agriculture during the decade will remain equal to the number so reported in 1940. Any actual increase or decrease in the total number of persons so employed would increase or decrease the estimated number required for replacement by the number of that increase or decrease.

Workers in Agriculture.—The number of persons employed or

seeking work in agriculture does not remain constant, but varies with comparative economic conditions in agriculture and in other occupations. On the whole, the number of workers in agriculture in Missouri has been declining. In 1940, the number of males aged 20 years and over employed or seeking work in agriculture was 279,629 as compared with 319,774 in 1930.¹³ Of those workers aged 20 years and over and reported in 1940, 75 per cent were farm operators, 19.4 per cent were wage workers and 5.6 per cent were unpaid family workers. The Federal Census reports the number of persons working or seeking work in agriculture aged 14 years and over. When these persons are added to those 20 years and over, the number of persons working or seeking work in agriculture is increased by 8.7 per cent, making a total of 306,311 persons. Over one-half (57.8 per cent) of these persons 14 to 19 years of age were unpaid family workers, 35.6 per cent were wage workers, and 6.6 per cent were farm operators.

The Age of Workers in Agriculture.—Although the Federal Census reports the number of persons working or seeking work in agriculture aged 14 years and over, children under 16 are usually in school, and persons 16 to 19 are also, to a considerable extent, either in school or at work as unpaid family workers. With these factors in mind and, also, because of the desirability of working with age groups of equal size, this study assumes 20 years as the age at which the replacement of gainful workers begins. Because of the relatively slight importance of female gainful workers in agriculture after the age of 20, the analysis is limited to the male population. Table 7 shows the age distribution of persons working or seeking work in agriculture, regardless of their place of residence.¹⁴

Of all males engaged in agriculture in Missouri in 1940, nearly 70 per cent were aged 25 to 64 years. Only 8.8 per cent were under 20 years of age, and 1.6 per cent were aged 75 and over. Farm operators were oldest, with only 22.7 per cent of the total under 35 years of age and 14.2 per cent 65 years of age and over. Farm laborers were considerably younger. Wage workers were most likely to be 20 to 34 years of age, 46.9 per cent being in that age group. More than three-fourths (77.1 per cent) of male unpaid family workers were under 25 years of age, and 28.3 per cent were 14 to 17 years of age. More

¹³The 1930 and 1940 Censuses are not strictly comparable. Persons were enumerated as gainful workers in 1930 if they reported a gainful occupation regardless of whether they were working or seeking work at the time of the Census. The 1940 Census included only those persons working or seeking work during the week, March 24 to 30 of that year.

¹⁴Ninety-seven and three-tenths per cent of the farm operators, 90.6 per cent of the unpaid family workers and 77.4 per cent of the wage workers 14 years and over lived on farms. This analysis is concerned chiefly with replacements for rural-farm workers in agriculture and the total number of persons enumerated in Table 7 has been reduced accordingly.

TABLE 7. MALES EMPLOYED OR SEEKING WORK IN AGRICULTURE IN MISSOURI 1940, CLASSIFIED BY AGE AND TYPE OF WORKER

Age	Type of Worker							
	Total		Farm Laborers					
			Farm Operators		Wage Workers		Unpaid Family Workers	
Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	
Total	306,331	100.0	211,528	100.0	63,626	100.0	31,177	100.0
14	1,180	0.4	8	*	186	0.3	986	3.2
15	2,541	0.8	25	*	606	1.0	1,910	6.1
16 - 17	9,353	3.1	198	0.1	3,222	5.1	5,933	19.0
18 - 19	13,628	4.5	1,539	0.7	5,479	8.6	6,610	21.2
20 - 24	32,503	10.6	10,176	4.8	13,725	21.6	8,602	27.6
25 - 34	56,843	18.6	36,254	17.1	16,130	25.3	4,459	14.3
35 - 44	52,706	17.2	42,622	20.2	8,796	13.8	1,288	4.1
45 - 54	56,090	18.3	48,501	22.9	7,073	11.1	516	1.7
55 - 64	48,470	15.8	42,298	20.0	5,735	9.0	437	1.4
65 - 74	27,992	9.1	25,165	11.9	2,477	3.9	350	1.1
75 and over	5,025	1.6	4,742	2.3	197	0.3	86	0.3

* Less than five-tenths of one per cent.

Source: 16th Census of U.S. Population. Third Series. The Labor Force, Missouri, Table 13, pp. 28-31.

than 93 per cent of all males under age 20 working or seeking work were farm laborers. After age 35, however, the proportion of all male workers that were laborers declined rapidly.

Replacement Requirements of Rural-Farm Workers in Agriculture.—It is evident that the total number of workers in agriculture is affected by three factors: death, retirement, and net migration. The death rate, which is relatively low for workers in the more youthful age groups, mounts steadily until it makes serious inroads upon the older age groups in the course of a decade. Thus, about 12 per cent of those aged 45 to 54 years in 1940 will be taken by death in the course of 10 years, and about one-fourth of those aged 55 to 64 years will be similarly taken. Retirement begins to reduce the number after age 55 and sharply decimates the number after age 65. Unlike the death rate, however, the retirement rate cannot be accurately predicted since it depends to some extent upon fluctuations of agricultural prosperity and upon other considerations.¹⁵

Net migration probably affects workers of all ages to some extent, but its influence is most evident before age 30. Farm-reared children who are employed as unpaid family workers and other young persons who are employed as wage workers in agriculture tend to migrate in large numbers to non-agricultural occupations. Some of those who

¹⁵It is plausible that the war depressed operator retirement rates because of the scarcity of replacements. With the relative prosperity since the war, any such lag will no doubt be adjusted.

leave agriculture eventually return to it, but the net result is a heavy loss of actual and potential workers before they reach the age of 30 years.

In order to estimate the replacement requirements of rural-farm workers in agriculture in Missouri for the decade, 1940-1950, it is assumed that the age distribution in 1950 will be identical to that of 1940. With this assumption, the problem consists of two steps; (1) by the use of life tables, calculate the number of workers in agriculture as of 1940 who will survive to 1950; (2) compare the resulting age distribution of 1950 survivors with the age distribution of workers in 1940 and attribute age group surpluses in the advanced age groups to retirement.¹⁶

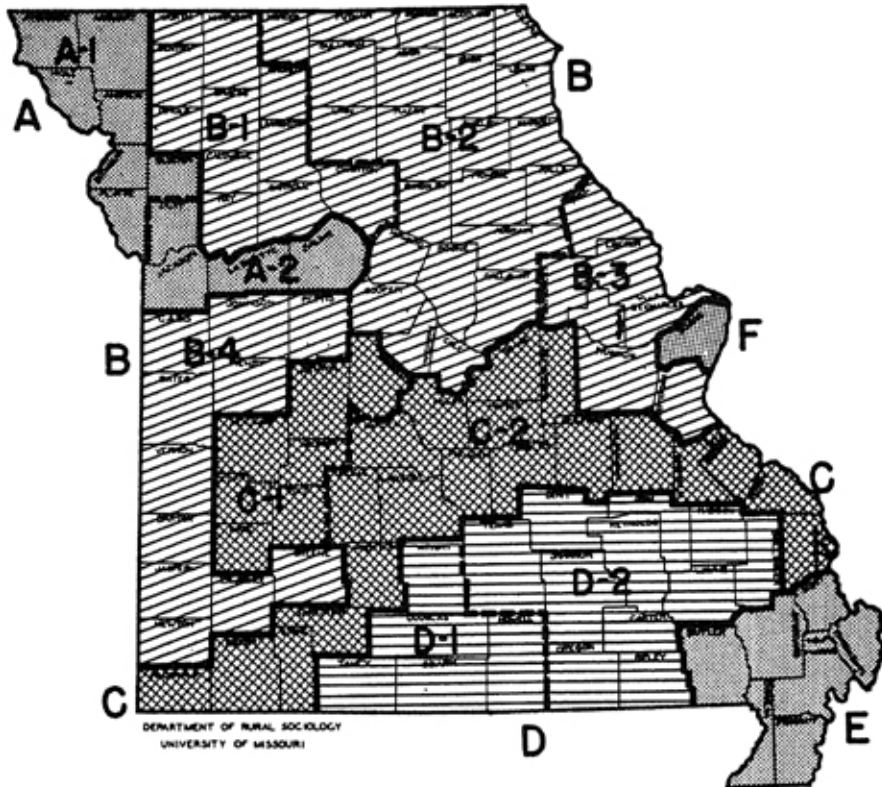
In addition to the replacement requirements, it is important to know the number of rural-farm males available for replacement, 1940-1950. That number will, of course, be the number of farm-reared males who are aged 10 to 19 years in 1940, minus the losses by death that will occur before these youth attain the age of 20 years, and the losses as a result of migration.

Missouri is a variable state both from the standpoint of agricultural wealth and income and from the standpoint of the rate at which farm-reared youth are being produced. The replacement requirements for rural-farm workers will vary considerably from one section to another. The rural-farm social sub-areas of the State, as of 1940, have been used as the basis of the analysis of replacement requirements for the different sections of Missouri.¹⁷ (See Map 12.)

In Table 8 these data are brought together to show the proportion of farm-reared males attaining age 20 during the decade, 1940-1950, that will be needed to replace the losses to workers in agriculture resulting from death and retirement. It is estimated that 48.4 per cent of the 118,437 males arriving at age 20 will be required to maintain the number of workers in agriculture at the level of 1940. In sub-area A, where the losses from retirement are relatively high and the birth rate relatively low, 60.4 per cent of the farm-reared males arriving at age 20 will be required for replacement if the number of workers in agriculture is to remain stationary. In sub-area B, where birth rates are also relatively low but losses from retirement slightly lower, only 57.4 per cent of the potential workers are required for replacements. In sub-area C, where birth rates are higher, only 44.5 per cent of the potential workers are required for replacement; and in

¹⁶The methodology presented in the first edition of this bulletin was followed in making the estimates of replacement requirements and the number available for replacement 1940-1950.

¹⁷A general description of these sub-areas see Lively, C.E., and Gregory, C.L., *Rural Social Areas in Missouri*, Missouri Agricultural Experiment Station, Research Bulletin 414, April, 1948.



Map 12. Rural-Farm Social Areas in Missouri, 1940.

TABLE 8. NUMBER OF RURAL-FARM MALE WORKERS EMPLOYED OR SEEKING WORK IN AGRICULTURE IN MISSOURI, NUMBER (a) LOST BY DEATH AND RETIREMENT, AND NUMBER (a) OF RURAL-FARM MALES ARRIVING AT AGE 20, CLASSIFIED BY RURAL-FARM SOCIAL SUB-AREAS

Rural-Farm Social Sub-Area	Number of Rural-Farm Males Employed or Seeking Work in Agriculture 1940	Number (a) of Male Workers Lost by Death or Retirement, 1940-1950	Rural-Farm Males Arriving at Age 20 Between 1940 and 1950		
			Number (a)	Ratio to Gainful Workers	Per Cent Required for Replacement
The State	260,894	57,366	118,437	45.4	48.4
A	29,655	6,867	11,378	38.4	60.4
B	109,853	24,420	42,512	38.7	57.4
C	58,762	12,736	28,626	48.7	44.5
D	28,091	5,987	15,530	55.3	38.6
E	30,407	6,381	18,492	60.8	34.5
F	4,126	975	1,899	46.0	51.3

(a) Estimated

sub-area D, where birth rates are high, only 38.6 per cent of the farm-reared males are required for replacement. In sub-area E, where birth rates are among the highest in the State, only 34.5 per cent of the potential workers will be required for replacement. Finally, in sub-area F which consists of St. Louis county, 51.3 per cent of the farm-reared males arriving at age 20 will be required for replacement.

The above figures should be regarded as reliable for the decade, 1940-1950 only. Previous computations show that the proportion of farm-reared males that could be employed in agriculture without expanding the labor force during the previous decade was somewhat higher in all areas than for this decade. Furthermore, the current trend toward mechanization and greater labor efficiency in agriculture suggests that the proportion may be still lower in the decade just ahead. Finally, the number of farm-reared males needed in agriculture will be reduced by the number of non-farm males successfully competing with them for a place in the farming occupation.

Implications for Agricultural Opportunity.—It appears to be clear from the data presented above that the rural-farm population is producing during this decade, 1940-1950, more than twice as many potential male workers aged 20 years as can be employed in agriculture without expanding the manpower of the industry. The same conclusion applies with even greater force for the female sex, since the proportion of farm-reared females that remains on the farms is generally lower than for males. Furthermore, with the changes which occurred in the agricultural industry during the war, it seems safe to assume that in the postwar period the industry will be able to absorb still fewer workers annually unless farm labor is cheapened. Therefore, the task of finding non-agricultural opportunity for surplus workers is an important one. Among other things, it involves assisting these young people to develop their capacities and abilities for non-agricultural work. It also suggests the desirability of better means of informing farm-reared youth of the occurrence of non-agricultural opportunity outside their home communities.

The opportunity for farm-reared youth to enter the occupation of farming by replacing gainful workers lost through death or retirement is unequally distributed throughout the State. Areas of high agricultural income and low birth rates can use up to three-fifths of the locally reared males in the industry without expanding the manpower. Areas of low income and high birth rates can use two-fifths or less of the locally reared males. These differentials suggest that some variation in educational policy among the sub-areas is desirable. It seems plausible that training for non-agricultural vocations should

receive greater emphasis in the areas of low agricultural income and high birth rates than in the areas of high income and low or moderate birth rates. In view of the heavy emigration of youth that has characterized the areas of high income in the past, perhaps these areas have placed too great emphasis upon non-agricultural education. It seems plausible that the better agricultural areas should recruit their future farmers from the youth of their own families, while the poorer farming districts contribute heavily of their youth to the non-agricultural occupations.

The above discussion should not be interpreted to mean that farm-reared youth of exceptional ability and an interest in farming should not enter the occupation in certain areas. There is opportunity in almost any occupation for persons of more than average ability. It is highly desirable that in all sections of the State, the persons who elect to farm possess at least average ability. Doubtless good returns and a satisfying life await those of superior ability who elect to enter the occupation of farming.

APPENDIX: COUNTY DATA

TABLE I

County	Population - 1940				Rural Farm Population 1945	Per Cent Change in Farm Population 1940-45
	Total	Rural-Farm	Rural-Nonfarm	Per Cent Rural		
Adair	10,166	7,849	2,317	50.2	6,251	-20.4
Andrew	13,015	8,664	4,351	100.0	6,709	-22.6
Atchison	12,897	7,509	5,388	100.0	5,532	-26.3
Audrain	10,948	8,174	2,774	48.3	6,446	-21.1
Barry	19,727	15,601	4,126	83.8	12,946	-17.0
Barton	11,156	7,925	3,231	78.9	6,545	-17.4
Bates	16,573	11,345	5,228	84.9	8,740	-23.0
Benton	11,142	8,430	2,712	100.0	6,202	-26.4
Bollinger	12,898	10,823	2,075	100.0	7,490	-30.8
Boone	16,592	11,674	4,918	47.4	7,981	-31.6
Buchanan	18,356	9,952	8,404	19.5	8,100	-18.6
Butler	23,113	19,016	4,097	67.4	14,365	-24.4
Caldwell	11,629	6,676	4,953	100.0	5,129	-23.2
Callaway	14,797	11,370	3,427	64.1	7,953	-30.0
Camden	8,971	5,829	3,142	100.0	4,241	-27.2
Cape Girardeau	15,236	12,205	3,031	40.3	9,812	-19.6
Carroll	13,744	9,912	3,832	77.2	7,362	-25.7
Carter	6,226	3,418	2,808	100.0	2,296	-32.8
Cass	19,534	10,879	8,655	100.0	8,948	-17.7
Cedar	11,697	7,844	3,853	100.0	6,195	-21.0
Chariton	18,084	11,350	6,734	100.0	8,136	-28.3
Christian	13,538	10,274	3,264	100.0	8,279	-19.4
Clark	10,166	6,143	4,023	100.0	4,903	-20.2
Clay	19,267	7,502	11,765	63.3	6,139	-18.2
Clinton	9,749	5,881	3,868	73.5	4,565	-22.4
Cole	10,644	7,727	2,917	30.5	6,734	-12.8
Cooper	11,986	8,916	3,070	66.3	6,415	-28.0
Crawford	12,512	8,168	4,344	98.6	5,666	-30.6
Dade	11,248	7,904	3,344	100.0	6,059	-23.3
Dallas	11,523	8,990	2,533	100.0	7,714	-14.2
Davies	13,398	8,651	4,747	100.0	6,924	-20.0
De Kalb	9,648	6,468	3,180	98.9	4,888	-24.4
Dent	8,612	7,365	1,247	73.2	5,596	-24.0
Douglas	15,600	13,115	2,485	100.0	8,937	-31.8
Dunklin	35,949	26,925	9,024	80.0	19,000	-29.4
Franklin	24,776	13,779	10,997	73.2	11,457	-16.8
Gasconade	12,414	6,658	5,756	100.0	5,693	-14.4
Gentry	13,359	7,414	5,945	100.0	5,765	-22.2
Greene	29,303	18,171	11,132	32.4	15,675	-13.7
Grundy	8,670	6,457	2,213	55.2	5,142	-20.4
Harrison	13,843	10,322	3,521	83.8	8,416	-18.5
Henry	16,272	10,258	6,014	72.9	7,446	-27.4
Hickory	6,506	5,027	1,479	100.0	4,489	-10.7
Holt	12,476	6,714	5,762	100.0	5,034	-25.0
Howard	10,418	6,642	3,776	80.0	4,703	-29.2
Howell	18,244	13,965	4,279	81.9	11,010	-21.2
Iron	10,440	5,666	4,774	100.0	3,884	-31.4
Jackson	62,584	15,461	47,123	13.1	14,512	- 6.1
Jasper	24,872	12,636	12,236	31.6	10,452	-17.3
Jefferson	18,865	10,536	8,329	58.9	8,066	-23.4
Johnson	15,749	11,452	4,297	72.9	9,304	-18.8

TABLE I -- (Cont'd)

County	Population - 1940				Rural Farm Population 1945	Per Cent Change in Farm Population 1940-45
	Total	Rural-Farm	Rural-Nonfarm	Per Cent Rural		
Knox	8,878	5,788	3,090	100.0	4,745	-18.0
Laclede	13,693	11,882	1,811	73.2	8,012	-32.6
Lafayette	18,982	11,360	7,622	68.1	8,977	-21.0
Lawrence	20,005	12,186	7,819	81.2	10,688	-12.4
Lewis	11,490	6,057	5,433	100.0	4,568	-24.6
Lincoln	14,395	8,498	5,897	100.0	6,456	-24.0
Linn	12,036	8,207	3,829	56.2	6,711	-18.2
Livingston	9,988	7,735	2,253	55.5	5,790	-25.1
McDonald	15,749	11,363	4,386	100.0	8,485	-25.3
Macon	17,190	11,933	5,257	80.3	9,224	-22.7
Madison	6,242	4,556	1,686	64.6	3,363	-26.2
Maries	8,638	7,310	1,328	100.0	5,202	-28.8
Marion	10,711	6,771	3,940	33.9	5,249	-22.5
Mercer	8,766	6,163	2,603	100.0	4,406	-28.5
Miller	12,208	9,834	2,374	82.5	7,563	-23.1
Mississippi	17,967	13,826	4,141	77.6	9,138	-33.9
Moniteau	9,250	6,658	2,592	78.6	5,316	-20.2
Monroe	13,195	8,261	4,934	100.0	6,168	-25.3
Montgomery	12,442	6,986	5,456	100.0	5,443	-22.1
Morgan	11,140	7,507	3,633	100.0	5,910	-21.3
New Madrid	39,787	25,823	13,964	100.0	19,193	-25.7
Newton	22,792	15,695	7,097	78.5	13,259	-15.5
Nodaway	19,856	13,808	6,048	77.7	11,353	-17.8
Oregon	13,390	9,885	3,505	100.0	7,463	-24.5
Osage	12,375	8,418	3,957	100.0	7,384	-12.3
Ozark	10,766	9,634	1,132	100.0	7,151	-25.8
Pemiscot	37,617	31,413	6,204	80.3	21,150	-32.7
Perry	11,451	8,797	2,654	74.6	7,323	-16.8
Pettis	12,908	10,563	2,345	38.7	8,885	-15.9
Phelps	12,296	7,810	4,486	70.5	6,736	-13.8
Pike	13,658	8,660	4,998	74.5	6,625	-23.5
Platte	13,862	7,995	5,867	100.0	5,864	-26.6
Polk	14,764	12,082	2,682	84.9	9,455	-21.7
Pulaski	10,775	7,086	3,689	100.0	4,454	-37.1
Putnam	11,327	7,969	3,358	100.0	6,054	-24.0
Ralls	10,040	6,556	3,484	100.0	4,887	-25.4
Randolph	11,538	7,374	4,164	47.2	6,041	-18.1
Ray	14,344	9,768	4,576	77.2	6,912	-29.2
Reynolds	9,370	6,486	2,884	100.0	4,491	-30.8
Ripley	12,606	9,736	2,870	100.0	6,060	-37.8
St. Charles	14,759	9,628	5,131	57.7	7,188	-25.3
St. Clair	13,146	9,165	3,981	100.0	6,645	-27.5
St. Francois	23,081	6,523	16,558	64.2	5,506	-15.6
St. Louis	149,810	16,402	133,408	54.6	11,395	-30.5
Ste. Genevieve	8,118	5,750	2,368	74.4	4,673	-18.7
Saline	17,813	11,354	6,459	60.6	8,565	-24.6
Schuyler	6,627	4,182	2,445	100.0	3,265	-21.9
Scotland	8,557	5,540	3,017	100.0	4,379	-21.0
Scott	19,384	10,513	8,871	63.8	8,116	-22.8
Shannon	11,831	8,113	3,718	100.0	5,602	-31.0
Shelby	11,224	6,393	4,831	100.0	5,056	-20.9

TABLE I -- (Cont'd)

County	Population - 1940				Rural Farm Population 1945	Per Cent Change in Farm Population 1940-45
	Total	Rural-Farm	Rural-Nonfarm	Per Cent Rural		
Stoddard	29,901	23,400	6,501	90.6	16,299	-30.3
Stone	11,298	8,282	3,016	100.0	6,773	-18.2
Sullivan	13,701	9,295	4,406	100.0	7,411	-20.3
Taney	10,323	6,895	3,428	100.0	5,105	-26.0
Texas	19,813	15,506	4,307	100.0	12,237	-21.1
Vernon	17,405	11,826	5,579	68.0	9,408	-20.4
Warren	7,734	4,761	2,973	100.0	3,928	-17.5
Washington	17,492	6,785	10,707	100.0	4,768	-29.7
Wayne	12,794	8,325	4,469	100.0	4,544	-45.4
Webster	17,226	12,811	4,415	100.0	9,654	-24.6
Worth	6,345	4,338	2,007	100.0	3,184	-26.6
Wright	17,967	12,786	5,181	100.0	8,766	-31.4

TABLE II

County	Number of Children Under 5 years per 1,000 Women, 20-44 years, 1940			Value in Dollars of Farm Products Per Capita of Farm Population, 1940	Level of Living Index, 1940	
	Total Rural	Rural-Farm	Rural-Nonfarm		Rural-Farm	Rural-Nonfarm
Adair	533	525	557	249	105	84
Andrew	447	473	400	351	141	118
Atchison	503	568	418	664	170	141
Audrain	522	511	552	362	125	111
Barry	662	721	478	124	84	99
Barton	550	583	469	255	106	88
Bates	543	609	402	267	106	87
Benton	583	635	447	194	88	108
Bollinger	738	772	590	119	65	89
Boone	556	584	498	225	118	104
Buchanan	488	491	485	282	144	138
Butler	928	978	733	98	47	60
Caldwell	454	506	391	313	119	105
Callaway	546	574	465	227	105	100
Camden	653	689	602	137	66	87
Cape Girardeau	628	639	592	210	106	93
Carroll	517	536	464	395	120	102
Carter	869	912	824	55	48	69
Cass	463	520	397	325	121	122
Cedar	523	557	456	166	78	94
Chariton	533	562	488	295	113	105
Christian	544	582	441	174	92	96
Clark	515	564	451	271	116	99
Clay	443	464	432	545	142	150
Clinton	508	567	423	524	122	102

TABLE II -- (Cont'd)

County	Number of Children Under 5 years per 1,000 Women, 20-44 years, 1940			Value in Dollars of Farm Products Per Capita of Farm Popula- tion, 1940	Level of Living Index, 1940	
	Total Rural	Rural- Farm	Rural- Nonfarm		Rural- Farm	Rural- Nonfarm
Cole	616	663	489	234	121	115
Cooper	551	564	515	305	118	89
Crawford	725	778	650	118	77	96
Dade	524	584	389	223	93	96
Dallas	646	671	572	129	69	94
Daviess	482	529	402	304	102	101
DeKalb	425	451	374	371	119	109
Dent	701	671	870	159	76	52
Douglas	789	825	633	111	56	87
Dunklin	788	870	573	204	71	82
Franklin	550	577	524	233	111	134
Gasconade	480	588	397	173	97	148
Gentry	494	564	414	348	120	112
Greene	511	488	545	191	135	110
Grundy	512	517	497	281	107	87
Harrison	530	564	436	299	110	97
Henry	517	585	415	352	100	104
Hickory	555	580	480	181	83	89
Holt	517	541	490	483	139	107
Howard	547	576	503	327	130	109
Howell	672	713	566	107	65	91
Iron	792	887	706	93	62	78
Jackson	424	437	421	361	194	172
Jasper	527	545	511	176	136	95
Jefferson	547	521	573	154	127	130
Johnson	513	555	402	302	107	98
Knox	437	490	342	311	114	102
Laclede	749	747	761	161	71	72
Lafayette	489	502	471	398	139	114
Lawrence	476	571	365	186	107	105
Lewis	487	532	441	322	127	107
Lincoln	461	503	412	286	110	116
Linn	472	500	415	352	121	97
Livingston	559	559	561	316	111	87
McDonald	730	799	582	95	77	90
Macon	495	545	388	248	104	98
Madison	805	774	878	121	64	72
Maries	713	760	513	154	71	99
Marion	454	522	358	365	143	137
Mercer	491	517	434	251	94	103
Miller	661	691	565	149	83	88
Mississippi	805	852	660	253	58	78
Moniteau	482	522	397	221	111	99
Monroe	455	500	389	326	118	111
Montgomery	507	599	410	260	114	108
Morgan	599	664	493	150	94	101
New Madrid	809	940	607	274	63	80
Newton	647	684	579	147	104	87
Nodaway	566	636	417	414	135	100
Oregon	680	755	508	113	55	98

TABLE II -- (Cont'd)

County	Number of Children Under 5 years per 1,000 Women, 20-44 years, 1940			Value in Dollars of Farm Products Per Capita of Farm Popula- tion, 1940	Level of Living Index, 1940	
	Total Rural	Rural- Farm	Rural- Nonfarm		Rural- Farm	Rural- Nonfarm
Osage	675	723	588	158	88	100
Ozark	810	845	577	98	50	70
Pemiscot	764	815	548	226	70	83
Perry	732	737	717	219	103	96
Pettis	565	587	472	294	123	94
Phelps	610	665	533	152	80	98
Pike	532	556	496	334	117	98
Platte	473	492	450	387	133	120
Polk	544	560	479	198	94	85
Pulaski	593	658	489	148	70	98
Putnam	584	668	406	198	94	96
Ralls	494	531	433	249	130	109
Randolph	492	527	438	231	113	98
Ray	507	512	497	393	107	102
Reynolds	867	832	930	75	48	66
Ripley	794	881	567	98	49	91
St. Charles	522	541	495	301	128	128
St. Clair	581	625	490	195	82	91
St. Francois	607	703	576	129	96	101
St. Louis	415	388	417	256	204	207
Ste. Genevieve	701	698	706	191	91	98
Saline	411	513	268	452	129	104
Schuyler	464	542	337	316	122	105
Scotland	437	491	339	317	124	111
Scott	715	819	611	242	86	95
Shannon	832	816	861	98	52	67
Shelby	453	529	361	348	122	112
Stoddard	811	869	623	192	67	86
Stone	672	761	480	134	65	82
Sullivan	524	571	419	281	100	91
Taney	730	811	598	105	58	90
Texas	686	727	572	121	66	89
Vernon	512	618	309	212	95	90
Warren	416	496	321	259	110	142
Washington	956	858	1004	100	61	59
Wayne	791	856	694	85	49	81
Webster	615	675	477	160	83	102
Worth	552	595	468	303	126	106
Wright	642	713	498	123	65	90