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## ARIZONA'S AGRICULTURAL POPULATION

BY

E D TETREAU

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## SYNOPSIS AND IMPLICATIONS

1. The purpose of this study was to analyze Arizona's agricultural population as to its composition, characteristics, and location in relation to agriculture's requirements. This population was defined to include all persons in households whose heads were foremen and laborers, or tenants, owners, and managers. The greater part of the materials for this study was drawn from field studies of the agricultural population of Arizona's four principal irrigated areas in Graham, Maricopa, Pinal, and Yuma counties. Field interviews covered 2,432 households.

2. A comparison of the average ages of Arizona farm owners, tenants, and laborers with averages found in studies of farmers in other states and how they had achieved ownership suggested not so much a lengthening of the stages to ownership as a stoppage in the further advancement of many laborers and tenants. High average ages of laborers and tenants were due in most part to the presence among them of many who were unable to attain the next stage or who had reached it only to slip downward. About 70 per cent of the heads of resident and migratory laborers' households were less than 45 years of age. This distribution indicated ample physical vigor to meet the demands of field labor throughout most of the agricultural population.

3. Diverse races have entered into the composition of the agricultural population. These were most marked in the resident laborer population. In contrast, the migratory laborers were almost all native white, few of other color or nativity being found among them. Farm operators were more than 90 per cent non-Mexican white. It was evident that resident white laborers had penetrated the operator class in larger proportions than laborers of any other color, nativity, or race.

As to state or country of origin, 40 per cent of the heads of agricultural households came from southern states; 35 per cent were born in Mexico; 7 per cent came from other than southern states; 3 per cent were foreign born from European or Oriental countries. The remaining 15 per cent were natives of Arizona. In a great many states the farm practices of the operator and laborer are largely indigenous to the agriculture of the region, while Arizona's agriculture is still very much in the making, and her man power is culturally heterogeneous.

4. A check of occupational changes showed the precarious economic position of farm tenants and gave some glimpse of the misfortunes that have befallen tenants who have come from other states. Only 49 per cent of the heads who were farm tenants at the beginning of the period (1928-36) held their position on the occupational ladder or moved up during the period. The greater part of the remainder (40 per cent) had become farm laborers, while 6 per cent had jobs in other industries and 4 per cent were unemployed.

Eighty-three per cent of the farm owners at the beginning of the period were farm owners at the end of the period. Among

those in other occupations, 6 per cent had become farm tenants; 7 per cent had dropped back to the laborer stage; and 3.5 per cent had gone into other occupations.

Among resident laborers 80 per cent were in the same occupation at the close of the period as at its beginning. Between 11 and 12 per cent of them moved up the occupational ladder, some to become owners of farms, others to go into other occupations. About 8 per cent dropped into the ranks of the unemployed.

Seventy per cent of the migratory heads of households had at some time been share croppers, tenants, or owners of land. Just one half of them had operated farms since 1933 and of these 47 per cent were no longer tenants because of landlord-tenant changes. Financial difficulties, drought, poor health, and old age were in total responsible for fewer changes since 1933 than the one factor of landlord-tenant changes.

5. Resident heads of agricultural households were for the most part geographically stable. Only 15 per cent of the heads of households who were resident farm laborers made one or more changes in residence during 15 months. The greater part of these made only one change. The limited range of these moves was indicated by the fact that only 11 per cent of all of these laborer heads had lived outside the county of residence during 15 months. Eighty per cent of the farm owners lived on the same farm without change in location during an 8-year period, and more than one third of the farm tenants. The remaining 20 per cent of the owners averaged 5 years per farm, while all tenants averaged a little more than 5 years.

6. Family combinations accounted for 93 per cent of all households and were most strongly in evidence among migratory laborers' households. Resident laborers', tenants', and farm owners' and managers' households had the next greatest percentages, in the order named. Among resident laborers, family households were most in evidence with the whites, Mexicans following with a close second.

The resident Mexican laborer population contained the largest average number of persons per household. The smallest numbers per household were found among the white farm owners' population. Between these extremes, passing from large to small, came the white migratory laborers' households, white tenants', white resident laborers', and those laborers' households whose heads were colored.

7. One of every four agricultural households was located in a rural town. All but 3 per cent of farm operators' households were on farms. Resident laborers' households were 66 per cent on farms. Migratory laborers' households were largely in private and public camps and on the outskirts of towns. On the whole, whether located on farms or in towns, agricultural households were within 20 minutes of the fields where employed.

Two thirds of all resident laborers' households on farms were located in clusters of from two to twelve or fifteen households, while migratory laborers were for the most part located in camps

or on the edges of rural towns. Farm operators' households were in clusters to a lesser extent than laborers'.

8. When classified by age and sex, the agricultural population assumed the shape of a pyramid with concave sides, resting on a broad base of persons under 5 years of age and tapering to a point made up of persons 85 years of age and over. There was some deficiency in the numbers of persons aged from 25 to 44 years which was to be expected as a result of migration from farms to cities. The white farm laborer population made the most balanced pyramid of any of the occupational and tenure populations among whites. Rising from a base in which more than 40 per cent of the total population were found to be under 15 years of age, this pyramid not only showed balance in its shape but indicated an extremely prolific people. On the other hand, white farm owners' and managers' households contained a population from which a great part of the younger adults had been drawn by migration and marriage.

The population of white tenants' households more nearly assumed the shape of a pyramid than that of other farm operators. Though definitely deficient in children under 10 as compared with laborers, it came very near in percentage to the proportions under 10 in the total white population in the four counties. It contained a larger percentage of persons aged from 10 to 19 than the population of any other agricultural class.

The Mexican laborer population pyramid rose from a base in which 14 per cent of the population were under 5. Resident white laborers' households showed a population in which 16 per cent were under 5 and 39 per cent under 15. Migratory white laborers' population was 14 per cent under 5 years of age and 43 per cent under 15. Thus, while the Mexican laborer population contained larger households than any other agricultural class, the white laborer population, including resident and migratory households, formed a pyramid with a slightly broader base.

Rural-farm population in Arizona was strongly male, the sex ratio being 116 to 100 females as compared with 111 to 100 throughout the United States. In the four counties whose agricultural population was especially analyzed, the white laborer population contained 119.6 males to 100 females. Among white owners and managers and among tenants, the ratios were 116.5 and 109.4 to each 100 females. Among white migratory laborers there were 126.8 males per 100 females, while in the resident laborer population the ratio was 114.1 per 100. On the other hand, the sex ratio in the Mexican laborer population was 102 to each 100 females.

Natural dependents—that is, all persons under 15, or 65 years of age and over—were most numerous among migratory white laborers and least numerous among white farm operators.

9. Agriculture as a means of self-support was more important than any other occupation in Arizona. Twenty-three per cent of Arizona's gainful workers were engaged in agriculture. Manu-

facturing, trade, domestic service, and extraction of minerals were next in importance, in the order named. Agriculture gave employment to 27 per cent of Arizona's male gainful workers.

10. Agricultural population density ranged from 123.8 persons per square mile of irrigated land in Township 7 South, Range 27 East to 17.5 persons in Township 6 South, Range 7 East. On the whole, population density varied directly with the agricultural laborer population, the higher the percentage of laborers the greater the density.

11. Ten major factors were associated with the development of Arizona's agricultural population. Each unit was in itself a complex of influences. They were: the physical factor, technological organization, private capital, science as applied to agriculture, governmental regulation, entrepreneurship, workmanship, the direction and sources of migrations, competitive employment opportunities, and the influence of social systems upon population growth.

12. The implications of this study were many, but among them the following have been selected for emphasis:

a) Arizona's man power requirements for agriculture are numerically supplied by the resident agricultural population excepting during the peak months from September through December. A resident agricultural population of sufficient numbers to meet the year around labor demand will create many problems due to long periods of unemployment, alternative opportunities for employment being as they are. Given the present migratory situation with thousands of families stranded in Arizona, certain remedial measures would seem to be in order. The following are suggested:

(1) Spread of farming operations over seasons of low labor demand, in Arizona's special crop areas; (2) more extended use of the town and city day laboring population during the months of peak labor requirements, thus lowering the demand for out-of-state help; (3) carefully directed development of small industries in towns and cities so as to give nonagricultural part-time employment to seasonal farm laborers; (4) systematic improvement of farm houses and other farm buildings, thus offering both additional employment and more adequate shelter for the agricultural laborer population; (5) some form of federal subsidy or other assistance to all farm operators who employ seasonal laborers, with the express purpose of providing better housing for their workers.

b) Occupational and cultural backgrounds of Arizona's farm operators as well as laborers offer some handicaps to agriculture under irrigation. Many accustomed to farming on an easygoing level find it difficult to gear their plans to the fast moving pace necessary to successful farming under irrigation. Others, likewise deficient in a regard for workmanship but greedy for quick returns overexpand cultivated areas and threaten the entire structure of agriculture. Much of the difficulty in this regard is

due to intricate social factors that tie in with place of origin, age, tenure experience, nature of farming experience, etc. It is suggested that measures to bring about more desirable adjustments should include:

(1) Development of subject matter on the economics of irrigation and its dissemination among the farming population; (2) inclusion of labor requirements and their probable effects upon the composition and character of the population of the state in weighing the relative advantages and disadvantages of crops and crop enterprises under irrigation; (3) attention to the social qualifications and occupational backgrounds of population to be settled in newly developed areas.

c) Arizona must to a great extent depend upon its agricultural population as a source of future population growth. Extensive immigrations of young and fertile populations are not to be expected in the future, without unforeseen developments in the increase of water for irrigation or in the exploitation of mineral resources. Yesterday's population was largely subject to the impact of external factors among which was the influx of new migrants. Tomorrow's agricultural population will be more self-generating with regard to its composition and character, and it will have a greater determining influence upon the total population of the state.

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# ARIZONA'S AGRICULTURAL POPULATION\*

BY E. D. TETREAU

## INTRODUCTION

In simplest terms man is the most important of the primary factors of production. Man makes the improvements and determines location with respect to markets; man accumulates supplies and devises implements; man applies human energy and manual dexterity; and man manages enterprises and takes the risks necessary to their development. Man holds the keys to production, although nature limits the returns for his labor.

Perhaps nowhere is the importance of man in the creation of useful things more dramatically exemplified than in the agriculture of semiarid regions. While the uplands are made to support sheep and cattle, the low, hot, dry valleys are reclaimed under irrigation, and green fields testify to man's ingenuity and toil.

## PURPOSE OF THE STUDY

Much has been written about Arizona's agriculture. Crops and livestock have been described, and problems associated with their improvement have been given considerable attention. Only to a limited degree, however, has knowledge of the population gainfully employed in agriculture been organized in usable form. During the past 5 years, a study of Arizona's population whose gainful workers are employed in agriculture has been carried on by the Arizona Agricultural Experiment Station with the object of showing: its location on the land, its composition and characteristics as related to the demands and requirements of agriculture, and the factors associated with its location, composition, and characteristics. It is believed that the following pages contain the first fairly complete description and analysis of the agricultural population yet made available to the people of Arizona.

## AGRICULTURAL POPULATION DEFINED

Practically all studies of "rural" and "farm" population whose data are taken from the decennial census are more strictly concerned with place than with occupation.<sup>1</sup> "Rural" population includes all population on farms and in centers of less than 2,500 without regard to occupation, and, in the same manner, "rural-farm" population includes all persons on farms, both those whose occupation is agriculture and those engaged in other occupations. The agricultural population of Arizona was defined for purposes

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<sup>1</sup>A noteworthy exception is found in "Composition and Characteristics of Agricultural Population in California," *California Agr. Exp. Sta. Bull. 630* (Berkeley, June, 1939), by George M. Peterson, in which the agricultural population on farms and in towns is strictly segregated.

of this study as including all persons who lived in those rural households whose heads were farm owners, managers, tenants, foremen, and laborers. No other "rural" or "rural-farm" population was included.

#### SOURCE MATERIALS

Source materials for this study were obtained from the population volumes of the decennial census of 1930, from the 1935 census of agriculture, and from schedule records of house-to-house interviews made as of April 1, 1936, and subsequently. The last schedules of information gotten from the field were gathered as of March 15, 1940. During 1936, schedules were obtained from nearly 3,000 rural households of which only the schedules of agricultural households were used in this study. These included 653 farm operators' households, and 1,401 resident farm laborers' households. All were within the limits of irrigation enterprises and were representative of the agricultural population of Arizona's four major irrigated areas—the Safford, Salt River, Casa Grande, and Yuma valleys (Fig. 1). During March, 1940, 378 migratory farm laborers' households were studied, the greater part of them being, at the time, in the Salt River Valley. Thus the agricultural population in the more important irrigated areas was studied at first hand. Other agricultural population, largely in the range areas and in small communities in central and northern Arizona, did not fall within the scope of the field studies but was described by making use of decennial and agricultural census tables.

#### STATISTICAL UNIVERSE AND SAMPLES

The universe with which this study was concerned included a population of about 115,000 persons. About 100,000<sup>2</sup> persons were located on farms (Table 1), and it was assumed that the number of persons on farms whose support came from nonagricultural employment would not exceed the number of persons who were located in towns of less than 2,500 whose support came from agricultural employment. An additional 15,000 persons were estimated to be located in Graham, Maricopa, Pinal, and Yuma counties, in small towns, by far the greater part of whom were farm laborers. Some, however, were farm operators. This estimate was made by the application of percentages obtained from the April, 1936, study to the farm population figures of the census of agriculture. According to this study, agricultural population on farms comprised 55, 82, 78, and 68 per cent, respectively, of the agricultural population of the irrigated areas of these counties, while the remainder of the agricultural population to the extent of 45, 18, 22, and 32 per cent was to be found in the small towns.

<sup>2</sup> *United States Census of Agriculture 1935*, United States Department of Commerce, Bureau of the Census; *Arizona Statistics by Counties, Second Series*, County Table IV.

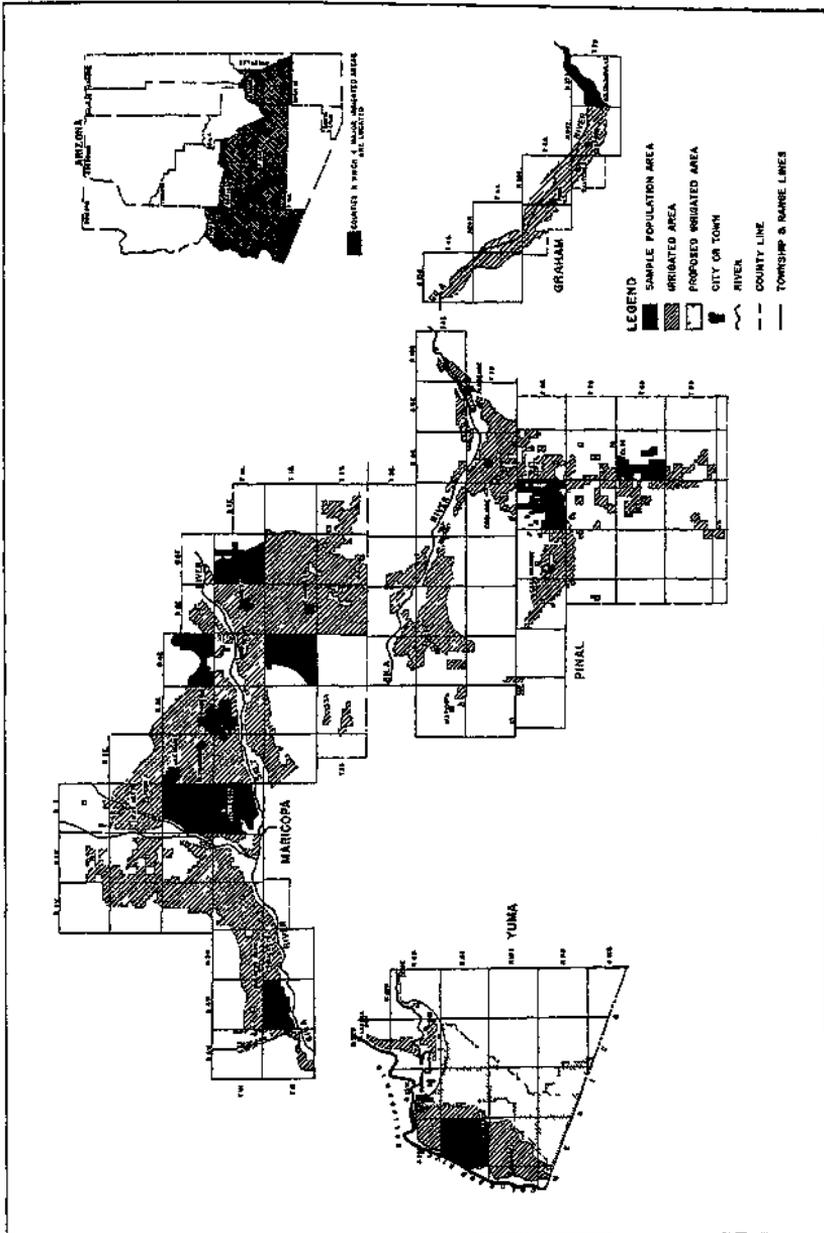


Figure 1.—Four major irrigated valleys in Arizona.

TABLE 1.—AGRICULTURAL POPULATION\* (JANUARY 1, 1935).

County	Population on farms			Other agricultural population	Total
	White (including Mexicans)	Colored (including Indians)	Total population on farms		
Apache.....	2,852	10,088	12,940	.....	12,940
Cochise.....	5,063	107	5,170	.....	5,170
Coconino.....	1,484	3,759	5,243	.....	5,243
Gila.....	1,252	274	1,526	.....	1,526
Graham.....	4,812	81	4,893	4,003	8,896
Greenlee.....	1,221	0	1,221	.....	1,221
Maricopa.....	29,715	3,791	33,506	7,355	40,861
Mohave.....	1,488	486	1,974	.....	1,974
Navajo.....	2,891	6,221	9,112	.....	9,112
Pima.....	4,079	2,888	6,967	.....	6,967
Pinal.....	4,475	2,825	7,300	2,059	9,359
Santa Cruz.....	1,701	18	1,719	.....	1,719
Yavapai.....	3,607	44	3,651	.....	3,651
Yuma.....	3,961	900	4,861	2,287	7,148
Total.....	68,601	31,482	100,083	15,704	115,787

\*Agricultural population in Graham, Maricopa, Pinal, and Yuma counties was obtained by adding the population on farms January 1, 1935, to an estimated number for each county living in towns of less than 2,500 population. The estimates were made by applying the percentages of the agricultural population of these counties that lived in towns and on farms as found in the field study of April 1, 1936. It was assumed that the same percentages obtained on January 1, 1935. It was assumed, in the case of the other counties, that the nonagricultural population on farms was about equaled by the agricultural population in towns.

Note must be made of an additional number of households, classified as migratory farm laborer households, whose population was not included in the foregoing estimates. These were households which in former years would have remained in Arizona only during the cotton-picking season. By far the greater numbers of them would have then returned to Oklahoma, Texas, or other states, in which they were engaged in farming during the larger part of the year, as share tenants, croppers, or wage hands. The first striking evidence of a major dislocation appeared at the close of the cotton-picking season of 1937-38. Although there was no further demand for their labor in Arizona, more than 3,000 households stayed over, assisted for the most part by the Farm Security Administration. Since that time additional numbers of these households have come in, and it is now apparent that only part of them were driven westward by drought. Many were displaced from the land through crop and acreage adjustment and other factors with which this report is not primarily concerned. Since the population of these households is definitely agricultural in origin and since it is for the time being located within the bounds of Arizona, an analysis of its composition and characteristics is included in this study.

CHARACTERISTICS OF HEADS OF HOUSEHOLDS WHOSE  
OCCUPATION IS AGRICULTURE

## TENURE AND OCCUPATIONAL CLASSIFICATION

Agricultural population was defined for purposes of this study as including all persons who lived in those households whose heads were farm operators or farm laborers. The operators included owners, managers, and tenants; and the laborers included nonmanaging foremen and hired farm laborers. This definition was applied with particular reference to the households studied by field visitation. Thus the occupation of the head of the households determined whether or not its members would be counted in the population included in this study.

Of the 2,432 households that were given special analysis, 653 were farm operators' households and 1,779 were laborers. More than three fourths of the heads of households who were farm operators were owners or managers. A similar proportion of the farm laborers who were heads of households were resident laborers—that is, they were living on farms or in rural towns on April 1, 1936.

The fact that almost three fourths of the heads of households in the agricultural population of Graham, Maricopa, Pinal, and Yuma counties were hired farm laborers testified to the industrial character of a great deal of their agriculture. This was further borne out by data which showed that while these counties had only 46 per cent of Arizona's farm operators, they contained 87.7 per cent of Arizona's hired workers as of January 1, 1935.

## SEX AND AGE OF HEADS OF HOUSEHOLDS

Analysis of the heads of households by sex and age, occupational status or tenure, nativity and color or race, and by movement from place to place and from occupation to occupation, threw much light upon certain basic considerations. Among these were the questions of the vigor and social stability of agriculture's adult gainful workers and of their cultural background in relation to Arizona's agricultural requirements.

Only 2 per cent of the heads of households were female. The greater proportion of female heads were found among the farm operators, while lesser percentages appeared among resident and migratory laborers. That this was partly due to the nature of agricultural labor was suggested by the fact that while 4 per cent of the heads who were operators were female, only a little more than 1 per cent of the heads of households who were resident laborers and less than 1 per cent of the heads who were migratory laborers were female.

The relative physical vigor of the heads of households who were farm laborers as compared with farm operators was indicated by the percentages of heads who were less than 45 years of age. A little more than 69 per cent of the resident and migratory laborer heads were to be found in these lower age classifications as com-

pared with 36 per cent of the heads who were owners or managers (Table 2). It must not be forgotten, however, that the 31 per cent who were aged 45 and over strongly suggested the presence of a permanent labor class in Arizona's agriculture and indicated that among Arizona's laborers there might be a considerable number who were once farm operators and who had been reduced to a wage-earning status.

Fifty-one per cent of the heads of households who were farm tenants were less than 45 years of age. It is important to note that more than one half of those under 45 were less than 35 years of age, suggesting definite progress along the occupational ladder and promise of further advancement. On the other hand, among the tenant heads, who were 45 and over, a significant proportion had passed the age of 55. These heads were fast approaching the time when the decline of physical vigor would call for a wiser or more extensive use of capital in order to permit the employment of laborers to do the work formerly done by themselves, or, if capital accumulation were lacking, when they might have to be satisfied with smaller returns.

The need for time to permit capital accumulation and entrepreneurial experience in the attainment of farm ownership was indicated in the large percentage of owners and managers (63) who were 45 years of age and over, 15 per cent being as much as 65 years of age and over.

#### COMPARISON BY AGE AND TENURE WITH OTHER STUDIES

A comparison of the average ages of the heads of households in the different tenure and occupational classes showed a rough correspondence between age and status. Laborers averaged a little less than 39 years of age, resident laborers being 38.9 and migratory laborers 38.6 years of age. Heads of households who were tenants averaged 43.2 years. Owners and managers averaged 49.7 years, and the exclusion of managers from the classification raised the average to 50.2 years.

Judging from the results obtained in other studies, the ages of Arizona's farm owners and tenants were more nearly alike than was the case in the Middle West, as shown by studies in Ohio and Wisconsin.<sup>3</sup> Ohio farm owners averaged 54.4 years of age and were 12.4 years older than Ohio tenants, while Wisconsin farm owners were 43.8 and tenants were 34.2 years old, a difference of 9.6 years. Only 7.0 years separated the average ages of Arizona owners and tenants, owners being 50.2 years of age and tenants 43.2. These figures suggested, for Arizona farm tenants, not so much a rapidly lengthening tenant stage as a stoppage in the further advancement of a very considerable proportion of them. Those who had attained ownership had done so at a sufficiently

<sup>3</sup>B. H. Hibbard and G. A. Peterson, "How Wisconsin Farmers Became Owners," *Wis. Agr. Exp. Sta. Bull.* 402 (Madison, Aug., 1928); and "The Agricultural Ladder in the Careers of 610 Ohio Farmers," *Journal of Land and Public Utility Economics*, Vol. VII, No. 2, Aug., 1931.

TABLE 2.—HEADS OF AGRICULTURAL HOUSEHOLDS CLASSIFIED BY OCCUPATIONS AND AGE.\*

Occupation of head of household	Age of head of household					65 and over	All heads of households
	Under 25	25-34	35-44	45-54	55-64		
Farm owner or manager.....	7	43	138	141	104	75	508
Farm tenant .....	11	28	35	46	21	4	145
Farm laborer (resident).....	134	489	346	273	111	48	1,401
Farm laborer (migratory) ..	46	117	99	74	37	5	378
All heads of households.....	198	677	618	534	273	132	2,432
	Per cent						
Farm owner or manager .....	1.4	8.4	27.1	27.9	20.5	14.7	100.0
Farm tenant .....	7.6	19.3	24.1	31.7	14.5	2.8	100.0
Farm laborer (resident).....	9.6	34.9	24.7	19.5	7.9	3.4	100.0
Farm laborer (migratory) ..	12.2	30.9	26.2	19.6	9.8	1.3	100.0
All heads of households.....	8.1	27.8	25.5	22.0	11.2	5.4	100.0

\*Information on the ages of farm owners, managers, tenants, and resident farm laborers was obtained in the field study as of April 1, 1936; information on the ages of migratory laborers was obtained in the study as of March 15, 1940.

early age to keep the average age of Arizona owners significantly lower than the average age of Ohio owners, though more than 6 years higher than the Wisconsin average. Those who did not attain ownership stayed on as tenants, thus tending to increase the average number of years in this classification, or they fell back to the laborer stage there to increase the average age of persons in that classification.

Definitely the heads of households who were farm laborers composed the greater part of each age classification of all heads, excepting those aged 65 years and over. Ninety per cent of the heads under 35 were laborers, 72 per cent of the heads aged 35 to 44, 65 per cent of those 45 to 54, and 54 per cent of those aged 55 to 64. Of those 65 and over, 40 per cent were laborers. It will be seen that the percentages of heads who were farm operators ranged from 10 per cent of the heads under 25 to 60 per cent of the heads aged 65 years and over.

This analysis of the age distribution of the heads of agricultural households also indicated the relatively small number of the heads of households that provided management and capital and that assumed the risks of agricultural production. These were to be found among the 27 per cent who were farm operators.

#### COLOR, NATIVITY, AND RACE OF HEADS OF HOUSEHOLDS

Diverse strains and races have entered into the composition of the agricultural population (Table 3). These have been most marked in the resident laborer population which has been found to contain native and foreign born whites of European origin, natives of India, Mexicans, Indians, Japanese, Filipinos, Negroes, and even a few Puerto Ricans. In contrast, the migratory laborers in Arizona were found to have been composed more largely of whites of European origin than any other occupational class in Arizona agriculture including farm owners.

TABLE 3.—COLOR, NATIVITY, AND RACE OF HEADS OF HOUSEHOLDS CLASSIFIED AS TO AGRICULTURAL OCCUPATION.\*

Color, nativity, and race	Agricultural occupation of head of household						Total	
	Farm operator		Farm laborer, res.		Farm laborer, mig.		No.	Per cent
	No.	Per cent	No.	Per cent	No.	Per cent		
White	596	91.3	530	37.8	367	97.1	1,493	61.4
Native born	556	85.1	516	36.8	366	96.8	1,438	59.1
Foreign born	40	6.2	14	1.0	1	0.3	55	2.3
Mexican	41	6.2	701	50.0	0	0.0	742	30.5
Native born	27	4.1	211	15.1	0	0.0	238	9.8
Foreign born	14	2.1	490	34.9	0	0.0	504	20.7
Negro	7	1.1	30	2.1	11	2.9	48	2.0
Yaqui†	0	0.0	126	9.1	0	0.0	126	5.2
Oriental	9	1.4	12	0.9	0	0.0	21	0.8
Other §	0	0.0	2	0.1	0	0.0	2	0.1
Total	653	100.0	1,401	100.0	378	100.0	2,432	100.0

\*Data for farm operators and resident laborers was drawn from the 1936 field study, and for migratory laborers from the 1940 study.

†Non-Mexican.

‡Includes twenty-six other Indians.

§These heads of households were Puerto Ricans.

It seemed probable that the various cultural and racial lines found extending through the resident laborer classification had, from this base, penetrated the farm operator class, since Mexicans, Negroes, and Orientals were to be found in considerable proportions among farm managers, owners, and tenants. These proportions were smaller than were to be found among resident laborers, with two noteworthy exceptions. Oriental farm operators constituted 1.4 per cent of all farm operators, while Oriental farm laborers made up less than 1 per cent of all resident farm laborers. White operators were 91.3 per cent of all operators, while white laborers were but 37.8 per cent of all resident laborers. It was possible, to be certain, that some Mexican heads of households had once been operators and had moved down to the status of laborer, as was probably the case in many instances during the occupation of the upper Gila Valley by white pioneer settlers. But more recent changes in occupational status seemed to have been in the other direction.

As has been indicated, it was evident that resident white laborers had penetrated the operator class in larger proportions than those of any other color, nativity, or race among resident laborers. That many heads of households who came from other states were farm operators and continued their careers in Arizona as such was probably true, but their tenure status did not by any means indicate that they came from a distinctive land-owning class. These men, in most cases, were self-made. Moreover, with recent influxes of white migratory laborer heads of households, significant proportions of which were once in the farm operator class,<sup>4</sup> it would not only seem probable that they would augment the numbers of resident white laborers but also that the younger and more ambitious among them would in time become farm operators.

Laborers and farm operators of Mexican origin decreased westward in proportion to the heads of other origins, while white laborers and farm operators increased westward. No Negro heads of households were found in the Safford Valley, while in the Casa Grande and Yuma valleys they were proportionally more numerous than in the Salt River Valley. No Yaqui Indians lived in the Safford Valley; they were most numerous in the Salt River Valley. Yumas were most numerous in the Yuma Valley, while Pimas and Papagos<sup>5</sup> occurred in the Casa Grande and Salt River valleys.

An important though more specific point regarding the background of the heads of agricultural households covered their farming experience during the formative years between the ages of 8 and 16 years. More than 90 per cent of the resident laborer heads, a similar percentage of the farm operator heads, and 98

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<sup>4</sup> Supporting data are presented in subsequent divisions of this report.

<sup>5</sup> The Papago Indian Reservation is located in Pinal and Pima counties, the greater part of its area being in Pima County. The Pimas live on the Gila River Reservation, located in Pinal and Maricopa counties.

per cent of the migratory laborer heads gave definite information showing that they had lived on farms during these years, by far the greater part having spent the entire period on farms. This information was considered to be essential to an understanding of attitudes and habits of work.

#### STATES AND COUNTRIES FROM WHICH HEADS CAME

Further light was thrown on the cultural background of the heads of agricultural households by classifying them according to the state in which they last claimed residence before coming to Arizona, if born elsewhere than in Arizona. First, it was noteworthy that only 18 per cent of the resident heads of households were Arizona born. The greater part of these were resident laborers, since 20 per cent of the laborer heads and 14 per cent of the farm operator heads were in this classification. Four fifths of the laborer heads of households born in Arizona were of Mexican origin, leaving a bare 4 per cent of all laborer heads as non-Mexican whites who were born in Arizona. Only 4 per cent of the operator heads of households native to Arizona were of Mexican origin, the remaining 10 per cent being non-Mexican white. No migratory laborer heads of households were born in Arizona.

Other states in the United States were claimed as the last state of residence before coming to Arizona by one third of the resident laborer heads, more than three fourths of the farm operator heads, and by all of the heads of migratory laborer households.

All but a small number of the resident non-Mexican white laborer heads, not of Arizona origin, came from Texas, Oklahoma, Arkansas, Missouri, and other southern states. A few came from California, Utah, Colorado, and New Mexico. In addition to these, as already indicated, were the Mexicans who were born in Mexico, Negroes from the same states as the whites, Orientals, and Indians among resident laborer heads.

Migratory laborer heads of households were a little less than 75 per cent from Texas and Oklahoma, the numbers from each being nearly equal. Another 7 per cent came from Missouri and Arkansas, again the numbers from each being nearly equal, while the remainder came from California, New Mexico, Colorado, and other states.

A little more than one half of the farm operator heads of households came from Texas, Oklahoma, Missouri, Arkansas, and other southern states. Such states as Colorado, California, and Kansas were claimed as the former place of residence by another 25 per cent. Six per cent of the operators were foreign born whites, and 2 per cent were born in Mexico. These heads together with 10 per cent Arizona born white, 4 per cent Arizona born of Mexican origin, and 2 per cent Orientals and Negroes, comprised the total number of the farm operator heads.

Taken as a whole, the heads of agricultural households (including migratory laborers) were 50 per cent from southern

states, 20 per cent of Mexican origin born outside of Arizona, 7 per cent from other than southern states, 5 per cent Mexican-born Indians, and 3 per cent European or Oriental. The remaining 15 per cent were natives of Arizona.<sup>6</sup> That the greater part of the heads of agricultural households came from other agricultural regions is sharply significant in relation to Arizona's agriculture. Their early training on the farm, their agricultural practices, and their habits of work were acquired in the cotton regions, on the high plains, on the plateau lands of northern Mexico, and elsewhere. Few came from areas in which irrigated farming had been pursued for many years with some considerable degree of success such as the valleys of northern Utah and north-central Colorado. Few came from areas of efficient dairy farming such as are to be found in Wisconsin and Minnesota. Many came from the cotton belt where their farming experience had been gained as croppers and share tenants: chopping, hoeing, and picking cotton. A few came as health seekers and homesteaders without previous agricultural experience. Even among natives of Arizona there were some heads of agricultural households whose early farming experience was gained in small dry farming areas or on the open range. To be certain, some of the heads of households that came from other regions appeared to be well prepared to take hold of farming under irrigation and to handle successfully the detailed and varied demands of a successful enterprise. Likewise, many that came in poorly prepared, or that were native to the state but nevertheless inexperienced in agriculture under irrigation, have made swift adaptations to the new conditions and have gained a substantial foothold in the agriculture of the major irrigated areas.

This varied cultural background places Arizona's agriculture in a position that differs from that of the agriculture in such states as Iowa and Ohio whose man power is largely native to the state. In those states the agricultural practices of the operator and laborer are largely indigenous to the agriculture of the region. Arizona's agricultural man power is still culturally somewhat heterogeneous.

#### GEOGRAPHIC MOBILITY OF HEADS OF HOUSEHOLDS

Social characteristics of the heads of agricultural households were further studied with reference to their movement from place to place. The migratory laborer heads gave evidence of travel over many routes. Some had been covering a route which began in the Rio Grande Valley, pointed northeastward through Arkansas to Michigan, then back to Texas and westward to Arizona—cotton, fruit, berries, cotton, and relief. Others worked in Utah and Idaho at the pea harvest, then to southern Oregon down through California, and to Arizona. Others found employment thinning grapes, apricots, and prunes in Kern and Fresno counties,

<sup>6</sup> This figure applies to agricultural population and happens to be identical with the figure for rural population.

California, stayed for the grape and fruit harvests, then came to Arizona to pick cotton, later returning to California. Still others came from east Texas where they were share tenants and croppers, having picked their own cotton before coming to Arizona. They returned to their homes after picking in Arizona was finished. A few traveled from Oklahoma through Texas, Arizona, California, and Oregon to Washington, and back to Oklahoma. By far the greater numbers of heads of households shuttled back and forth from Oklahoma and Texas to Arizona and California, taking their families with them wherever they went. They averaged 1,425 miles in travel between the points where employed or where they stopped to look for work during the year ending December 31, 1939.<sup>7</sup> Distances traveled were necessarily related to the relative sparsity of population in the Southwest and to the widely separated farming areas. It should not be assumed that the great numbers of these households traveled the year around. They were on the road only a few months, sometimes only a few weeks of the year. Their real plight was in their homeless condition, their lack of a base from which to operate.

Resident laborer heads of households were studied as to changes in residence during the 15 months from January 1, 1935, to April 1, 1936, residence being defined as any stop of 6 or more days in the course of a family's movement from place to place. No estimates were made of distances traveled. Only 14 per cent of the male heads of households who were resident farm laborers made one or more changes in residence during the 15-month period. The greater part of these (11 per cent) made only one change, only 3 per cent having made two or more changes in residence (Table 4). This comparative stability of the great majority of Arizona's agricultural laborers has received but scant notice<sup>8</sup> on the part of the research workers and none at all from recent fiction writers and government investigators, some of whom have exploited the condition of migratory laborers' families more to their own advantage than to the advantage of the families concerned. Both heads of Mexican origin and of non-Mexican white background showed a high degree of stability, the most mobile subclass being found among the white laborers of the Casa Grande Valley. This was largely due to their more recent settlement in Arizona than was true of the majority of resident laborers in the other valleys. The limited range of migration of these laborer heads of households was indicated by the fact that 89 per cent of them lived in the county of residence at the time of the survey and in no other county during the 15-month period preceding.

Farm operators were studied with respect to the length of time

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<sup>7</sup> Distances traveled by each household were obtained by adding the road mileage between the centers of counties in which the head of the household worked or looked for work. No account was taken of local distances traveled.

\* Evidence of Stability on the part of farm laborers in Arizona may be found in *Ariz. Agr. Exp. Sta. Bull.* 163, pp. 306-9.

TABLE 4.—MALE HEADS OF HOUSEHOLDS WHO WERE EMPLOYED AS FARM LABORERS (RESIDENT) CLASSIFIED BY NUMBER OF CHANGES IN OCCUPATION AND RESIDENCE JANUARY 1, 1935, TO APRIL 1, 1936.\*

Changes in occupation	Changes in residence							Total heads	Per cent heads	
	Changes in residence									
	None	1	2	3	4	5	6			7 or more
None.....	98.8	44	8	4	0	0	0	0	1,044	79.9
One.....	69	72	4	0	0	0	0	0	145	11.1
Two.....	36	12	11	1	2	1	0	0	63	4.8
Three.....	16	11	2	2	0	0	0	0	31	2.4
Four.....	5	3	1	2	3	0	0	0	14	1.1
Five.....	2	2	1	1	0	0	0	0	6	0.5
Six.....	0	0	2	0	0	0	0	0	2	0.2
Seven or more.....	0	1	0	0	0	0	0	0	1	†
Total number.....	1,116	145	29	10	5	1	0	0	1,306	.....
Per cent.....	85.5	11.1	2.2	0.8	0.4	†	0	0	.....	100.0

\*Of 1,385 male heads of households who were resident farm laborers, there were seventy-nine for whom information on changes in occupation and residence was incomplete.

†Less than one tenth of 1 per cent.

they had lived on the same farm during the time from January 1, 1928, to April 1, 1936. It was found that 80 per cent of the owners had lived on the same farms during the entire period as had more than one third of the tenant operators. This high percentage of owners who had occupied but one farm during  $8\frac{1}{4}$  years, together with the remaining 20 per cent who averaged 5 years per farm, indicated a considerable degree of stability among these farm operators. Among tenant heads 35 per cent occupied but one farm in 8% years, while all tenants showed an average tenure length of a little more than 5 years.

#### VARIED CULTURAL BACKGROUNDS OF ARIZONA FARMERS

Further light was thrown on the subject of social stability by a study of the changes made by the heads of agricultural households from one occupation to another.<sup>9</sup> Farm operators and resident farm laborers were given detailed study in this regard. Migratory laborer heads were studied with respect to their employment and occupational history, but it was found that the most significant information had to do with their previous tenure status. For purposes of this study that was all that it was deemed necessary to report.

Less than one third (30.5 per cent) of 200 out-of-state heads of households who were interviewed as to occupational experience had been laborers, only, and had never rented land. By far the greater number of these had been farm laborers, only, but a few had found occasional employment in the oil fields, or in other nonagricultural industries. The remaining 69.5 per cent had at some time in their careers been share croppers, tenants, or owners of farm land. Just one half of the 200 had farmed since 1933 and of these 100 heads of households, forty-seven were no longer on farms because of landlord-tenant changes. These changes in a large part came as a consequence of crop adjustment and conservation measures. Ten heads of households had made rental agreements before leaving their home counties to come to Arizona. They planned to return to their home counties as soon as cotton picking was finished. The remaining forty-three heads who had farmed since 1933 and who were now laborers lost their places as tenants on account of financial difficulties, drought, poor health, and old age, the numbers of heads being sixteen, fifteen, eight, and four. Of the thirty-nine heads of households who had been renters previous to 1933 and whose displacement therefore had no relation to crop adjustment, thirty-four quit because of financial difficulties, three on account of drought, and two because of ill health.

These results were contrary to the popular supposition that

<sup>9</sup> See Definition of Terms (p. 91) for complete definition of change in occupation. Briefly, change in occupation was defined to include: change from employment to unemployment or vice versa; change from work that required a certain degree of skill to work that required more or less skill and/or paid higher or lower wages; change in location of work and employer, and for farm operators; change in tenure status.

migratory farm laborers are largely dust bowl victims of drought and windstorms. Apparently adjustments within agriculture have displaced more croppers and tenants than drought and all other factors combined. While it is outside of the scope of this report to analyze the basic factors of displacement in the western cotton belt, it does not seem amiss to say that maladjustment rather than adjustment has largely occurred in many areas. Basically, these maladjustments have come to pass because of failure to apply the knowledge of agricultural scientists to the problems of southern agriculture. The mechanical trappings of our modern day have made headway only to pulverize the soil more effectively for its final destruction. One man with a tractor can do this much more effectively than several tenants with mules. Meantime, what has become of the grasses and other cover crops, which, combined with livestock and an abundant supply of human labor, would transform southern agriculture to the end that both man and land would be conserved?

#### OCCUPATIONAL MOBILITY OF HEADS OF HOUSEHOLDS

Resident laborer male heads of households were found to be in the same occupation on April 1, 1936, as they had been January 1, 1928, to the extent of 80 per cent. However, it should be noted that among these were men who passed from unskilled farm labor to the position of foreman, so that within the class there was some advancement. More than 3 per cent became farm operators, 1 per cent being owners or managers, and 2 per cent tenants. Eight per cent went into other occupations, 6 per cent becoming skilled or semiskilled workers not on farms. A little less than 9 per cent were not gainfully employed on April 1, 1936. In all, 12 per cent moved up the occupational ladder, 80 per cent remained where they were 8 years earlier, and 8.5 per cent dropped into the ranks of the unemployed.

Male heads of households who were farm tenants on January 1, 1928, were found to be in the same occupation 8 years later to the extent of 36.5 per cent. Thirteen per cent of them had become managers or proprietors of enterprises, 11 per cent having become owners or managers of farms. Thus, only one half of them (49.5 per cent) held their position on the occupational ladder or moved up. The greater part of the remainder (40 per cent) had become farm laborers, another 6 per cent were employed as laborers in other industries, while 4 per cent were unemployed.

The great majority of male heads who were farm owners and managers 8 years earlier were still in this position on the occupational ladder on April 1, 1936. Only 17 per cent were in other occupations, 83 per cent having kept their status at the top of the agricultural ladder. Among those in other occupations, 6 per cent had become farm tenants, 7 per cent had dropped back to the laborer stage, and 3.5 per cent were in other occupations.

On the whole, the most significant downward changes in occupations of the heads of households in the 8 $\frac{1}{4}$  years were: the descent of more than two thirds of migratory farm laborers from

the status of cropper or tenant to that of migratory laborer, the failure of slightly more than one half of farm tenants to keep their place or to advance, and the fall of more than 13 per cent of heads who had been farm owners to the status of tenants and laborers. The fact that 8.5 per cent of all resident laborer heads dropped back among the unemployed was perhaps least surprising since these workers were on the same general competitive level as the incoming migratory laborers.

The most significant upward changes were: the upward climb of more than 10 per cent of the resident laborer heads of households and of 13 per cent of the farm tenants.

This examination of occupational changes as found in the careers of 2,400 heads of agricultural households gave evidence of the reasonably stable character of the resident laborer and farm owner heads of households. It showed the more precarious economic position of Arizona farm tenants and gave some glimpse of the misfortunes that have befallen former tenants in other states, now migratory farm laborers in Arizona. It also showed that even through years of considerable economic difficulty, some men have been able to advance their position among their fellows.

## CHARACTERISTICS OF AGRICULTURAL HOUSEHOLDS

### THE FAMILY AMONG AGRICULTURAL PEOPLE

The family was far more potent in social control than the miscellaneous forms of association to be found among agricultural people. It formed the people into small groups essentially primary in their social nature; it regulated elementary human behavior; it gave emotional stability to the individual; it afforded the means of an economical use of the materials of a livelihood; and it supplied those simple satisfactions of companionship that lightened the burden of the day and gave color to the drab careers of homeless workers, and significance to the toil of resident laborers and farm operators. Not only did it carry on the bulk of the head and hand work of agriculture but it bred and reared a new population sufficient in numbers to replace those now engaged in agriculture and to replenish the numbers of those employed in nonagricultural industries.

### PREVALENCE OF THE FAMILY AS A MEASURE OF SOCIAL STABILITY

In considering the relations of agricultural people to the requirements of agriculture, it seemed essential to inquire into the matter of the composition of households, the more clearly to determine the extent to which families were to be found as a predominant form of social control. It seemed reasonable to suppose that a farm laborer supply, whether resident or migratory, that was in the main composed of members of normal families, would display more occupational stability than a supply that had fewer family attachments and was in the main grouped into nonfamily associations. Thus a determination of the extent to which laborers'

households were composed of a man and woman; a man, woman, and children; or a normal family with others; constituted a measure of their social stability and of their suitability to the requirements of Arizona agriculture.

Furthermore, it was assumed that Arizona's supply of farm operators would be drawn from resident agricultural households to a greater extent in the future than during past years. Thus a high incidence of normal families, especially among farm operators' households was taken to indicate a continuity of training for great numbers of Arizona's future farm operators in personal habits and in ways of farming, under Arizona conditions, that are basic to success.

#### NORMAL FAMILIES AND FAMILY COMBINATIONS

Normal families were by far the most numerous type of household to be found among agricultural households. Husband-wife and husband-wife-children combinations accounted for 81 per cent of all households. All family combinations, that is to say, normal families, normal families with nonfamily persons, and broken families, accounted for 92.5 per cent of all households, leaving but 7.5 per cent of the households which were made up of lone persons or nonfamily combinations of persons (Table 5).

Family combinations were most strongly in evidence among migratory laborers' households (Fig. 2). Resident laborers' and tenants' households were next in order, and farm owners' and managers' households contained the smallest percentage of family combinations among tenure and occupational classes. The percentages of families among households were, by classes in the order named, 96, 93, 93, and 89 (Table 5).

Among resident laborers' households, family households were found in the largest percentage among the white households. Mexican laborers' households were familial in type to an almost equal extent, while Indian, Negro, and other colored laborers' households contained the smallest percentage of families and family combinations (Table 6).

#### BROKEN FAMILIES AND LONE PERSON HOUSEHOLDS

Broken families were relatively least numerous among farm tenants' households. They were more numerous among resident farm laborers' households and owners' and managers' households, migratory laborers' households having fewer than these households and more than tenants' households.

No lone women appeared among the one-person households of migratory farm laborers, and very few among resident laborers' households. They were relatively more numerous among operators' households. Lone men were most numerous among resident laborers.

#### FACTORS FAVORING FAMILY TYPE OF HOUSEHOLD

Factors that operated in favor of the family type of household among laborers were found to be: the age of the head of the

TABLE 5.—AGRICULTURAL HOUSEHOLDS CLASSIFIED BY COMPOSITION AND BY OCCUPATION OF HEAD OF HOUSEHOLD.

Composition of household	Occupation of head of household				Total households
	Farm owner or manager	Farm tenant	Farm laborer (res.)	Farm laborer (mig.)	
Normal family.....	398	125	1,141	301	1,965
Husband-wife.....	104	23	198	44	369
Husband-wife-children.....	294	102	943	257	1,596
Broken family.....	20	2	73	13	108
Man-children.....	7	0	45	10	62
Woman-children.....	13	2	28	3	46
Two or more normal families.....	2	0	16	0	18
Normal family with nonfamily persons..	32	7	70	50	159
Nonfamily household	34	7	72	2	115
Man alone.....	24	6	69	2	101
Woman alone.....	10	1	3	0	14
Other combinations....	22	4	29	12	67
All households.....	508	145	1,401	378	2,432

## Per cent

Normal family.....	78.3	86.1	81.5	79.7	80.8
Husband-wife.....	20.6	16.4	14.1	11.6	15.2
Husband-wife-children.....	57.7	69.7	67.4	68.1	65.6
Broken family.....	4.0	1.6	5.2	3.4	4.4
Man-children.....	1.5	0.0	3.2	2.6	2.5
Woman-children.....	2.5	1.6	2.0	0.8	1.9
Two or more normal families.....	0.3	0.0	1.1	0.0	0.8
Normal family with nonfamily persons..	6.3	4.9	5.0	13.2	6.5
Nonfamily household	6.8	4.9	5.1	0.5	4.7
Other combinations....	4.3	2.5	2.1	3.2	2.8
Total households.....	100.0	100.0	100.0	100.0	100.0

TABLE 6.—FARM LABORERS' HOUSEHOLDS CLASSIFIED BY COMPOSITION AND BY RACE AND NATIVITY OF HEAD (PER CENT).

Composition of household	Resident farm laborers			White migratory farm laborers	All laborers' households
	Yaqui, Negro, and other	Mexican	Non-Mexican white		
Normal family	73.7	80.4	85.7	79.7	81.1
Normal family with others	3.8	8.0	6.9	13.2	8.4
Broken family	13.4	5.3	2.2	3.4	4.8
Nonfamily household	8.1	5.1	4.1	0.5	4.1
Other combinations	1.0	1.2	1.1	3.2	1.6
All laborers' households	100.0	100.0	100.0	100.0	100.0

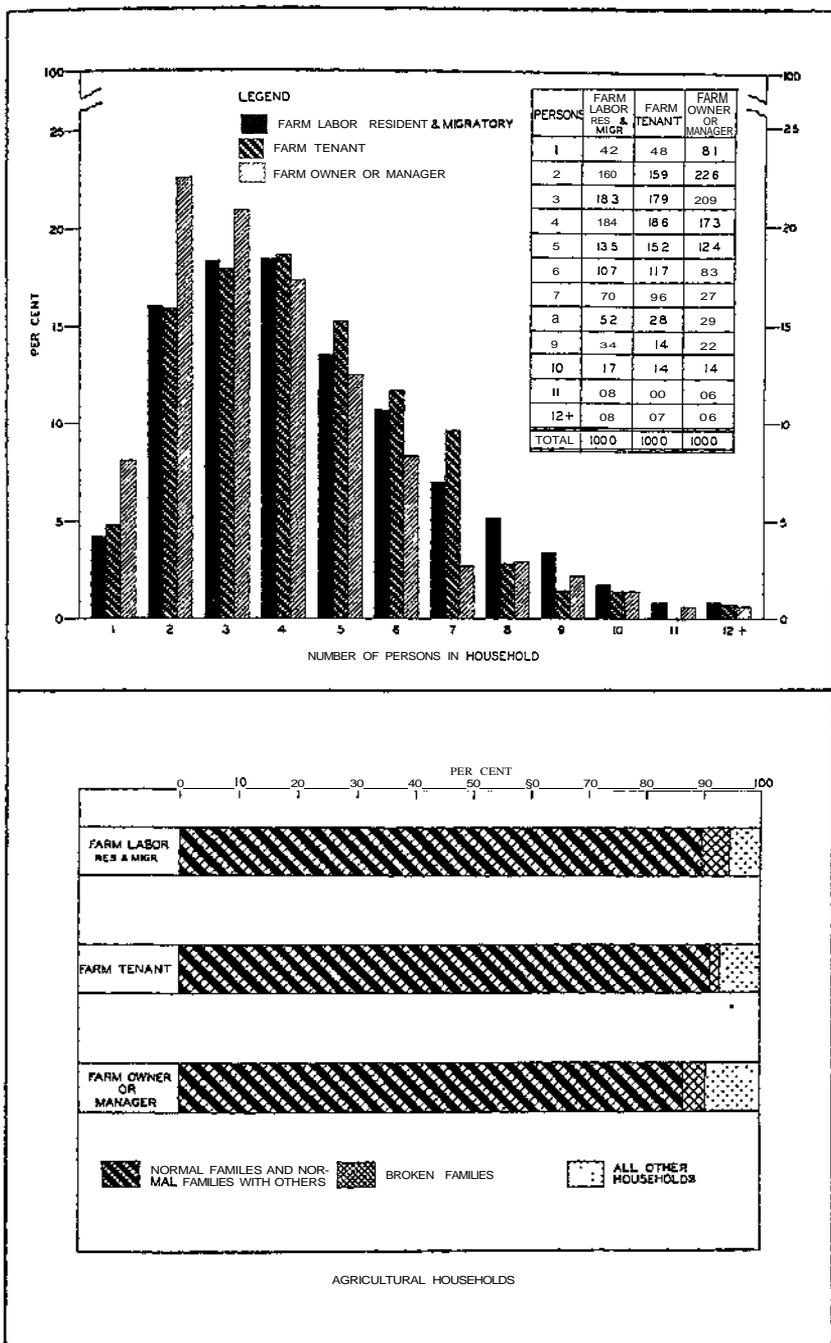


Figure 2.—Size and composition of agricultural households.

household, employer preference for seasonal workers in family groups, and the value of children in the attainment of certain social values desired by laborers. Almost 70 per cent of all resident and migratory laborer heads of households were less than 45 years of age. Since the women were generally younger than the men, it will be seen that large proportions of them were in the years when offspring were still in their care and children were more numerous in the population. Also, seasonal labor requirements gave advantage to the households that contained a reserve supply of seasonal workers besides the head of the household. The presence of children that could work in the fields on occasion tipped the scales of economic advantage in favor of family households. Then, too, some of life's more permanent values such as security and prestige were hardly to be attained by Mexican laborers, on the one hand, and the poorer whites of Missouri, Arkansas, Oklahoma, and Texas, on the other hand, excepting as they might be realized in a closely integrated family. The cultures of the old South and of old Mexico have long nourished the family tradition, and life among Arizona's farm laborers has been made richer thereby. Analysis of households by numbers of persons in them showed that households of five or more persons accounted for 40.5 per cent of all agricultural households in Arizona's major irrigated valleys. That quite large families were frequently found was shown by the fact that 3 per cent of all households contained ten or more persons. One and two person households made up 22 per cent of all agricultural households, and three and four person households another 37 per cent (Table 7). Agricultural households were larger than Arizona rural farm households, the median number of persons in the former being 4.48 as compared with 4.12 persons in rural farm households. They were considerably larger than rural farm households in the United States, the median for which was 4.02 persons.

#### HOUSEHOLDS CLASSIFIED BY SIZE AND TENURE OF HEAD

When classified by the tenure and color, nativity, or race of the head, agricultural households were found to be largest among Mexican resident laborers. White farm owners had the smallest households, the median number of persons being 3.87 as compared with 519 persons among Mexican laborers. Between these extremes, passing from small to large, came Indian and other colored laborers' households, white resident laborers', white tenants', and white migratory laborers' households. The median numbers of persons, in the order named, were 4.01, 4.25, 4.41, and 4.89.

The social significance of a classification of households by size was illustrated by making a comparison of the percentage distribution of households by size and the percentage distribution of the population they contained. Households of five or more persons, composing 40.5 per cent of the total number of households, contained 61.5 per cent of the total number of persons in all house-

TABLE 7.—ARIZONA'S AGRICULTURAL HOUSEHOLDS CLASSIFIED BY NUMBER OF PERSONS IN HOUSEHOLD AND BY OCCUPATION OF HEAD (PER CENT).

Occupation of head of household	Number of persons in household												
	1	2	3	4	5	6	7	8	9	10	11	12 or more	All households
Farmer owner or manager.....	8.1	22.6	20.9	17.3	12.4	8.3	2.7	2.9	2.2	1.4	0.6	0.6	100.00
Farm tenant.....	4.8	15.9	17.9	18.6	15.2	11.7	9.6	2.8	1.4	1.4	0.0	0.7	100.00
Farm laborer (res.)	5.1	16.8	17.8	18.5	12.1	10.7	7.1	4.8	3.6	1.6	0.9	1.0	100.00
Farm laborer (mig.)	0.5	13.0	20.4	18.3	18.8	10.6	6.3	6.6	2.9	2.1	0.5	0.0	100.00
All households.....	5.0	17.4	18.9	18.2	13.5	10.2	6.2	4.6	3.0	1.6	0.7	0.7	100.00

TABLE 8.—AGRICULTURAL POPULATION AS DISTRIBUTED AMONG HOUSEHOLDS BY SIZE OF HOUSEHOLD.

Item	Number of households and persons in households												
	1	2	3	4	5	6	7	8	9	10	11	12 or more	Total
Households.....	122	423	458	442	326	249	152	111	74	39	18	18	2,432
Persons in households.....	122	846	1,374	1,768	1,630	1,494	1,064	888	666	390	198	229	10,669
	Per cent												
Households.....	5.0	17.4	18.9	18.2	13.5	10.2	6.2	4.6	3.0	1.6	0.7	0.7	100.0
Persons in households.....	1.1	7.9	12.9	16.6	15.3	14.0	10.0	8.3	6.2	3.7	1.9	2.1	100.0

holds (Table 8). Conversely, households of less than five persons, composing 59.5 per cent of all households, contained but 38.5 per cent of all persons in agricultural households. One and two person households were 22 per cent of all households, but they contained only 9 per cent of the persons in these households. At the other extreme, households of nine or more persons, though accounting for but 6 per cent of all households, contained 14 per cent of the agricultural population (Table 8). The unequal distribution among households of the numbers of persons to be fed, clothed, and sheltered is part and parcel of the primary organization of society. Equalization takes place as group services are multiplied such as education at public expense, public health facilities, and the various forms of public assistance.

### HUMAN ECOLOGY

Location of households was studied with respect to farm and town, natural and fixed features in the landscape, the fields where engaged or employed in agriculture, and as to solitary, clustered, or town dwelling. Location as here considered signified position which was defined to include spatial groupings of socially related human beings, rather than as place on the earth's surface. Thus the location of farm laborers' households was considered in relation to the location of farm operators' households, of other laborers' households, and as to town or open country residence. Strictly this part of the study belongs in the field of human ecology.<sup>10</sup>

#### LOCATION OF HOUSEHOLDS ON FARMS AND IN TOWNS

Agricultural households were largely located on farms. Only one of every four farm households was found in town. Farm operators greatly preferred farm residence since 97 per cent of their households were located on farms, while, of resident laborers' households, 66 per cent were on farms. Migratory laborers' households were largely to be found in the cotton camps on farms during picking season, while some were to be found in the government camps at all seasons. Many migratory laborers camped on the outskirts of towns and cities, especially during off seasons.

Town residence was found in greater proportions among the agricultural households of the Safford Valley than among those of the other major irrigated areas. This fact was associated with the large proportion of Mexican laborers to be found in agricultural population. Also, there were numerous instances of town residence on the part of Mormon farm operators as well as laborers. Percentages of town residence decreased westward, the figures for the Safford, Salt River, and Casa Grande valleys being 49, 24, and 23. Yuma Valley agricultural households in towns were 33.5 per cent of the total. Yuma Valley's higher percentage of households in towns was largely a reflection of the fact that

<sup>10</sup>R. D. McKenzie, "The Scope of Human Ecology," *American Journal of Sociology* (University of Chicago Press, July, 1926), Vol. XXXII, No. 1, Part 2.

three fourths of the households were laborers and that over 40 per cent of these lived in towns, due for the most part to the absence of large camps such as are provided by large scale enterprises. Large scale enterprises were not as numerous among Yuma Valley farms as among the farms of the Salt River and Casa Grande valleys.

Although laborers' households made up a large part of the total population of such towns as Solomonville in the Safford Valley, Tolleson in the Salt River Valley, and Somerton in the Yuma Valley, they usually occupied a part of town in which few but laborers' households were to be found. Laborers' dwellings were not often located on or near the main street of the town. Occasionally, as in one part of Somerton, a separate cluster of houses facing a small plaza was occupied by laborers of predominantly Spanish ancestry, as distinct from near-by clusters of houses occupied by those whose ancestry was more largely Indian. Laborers' houses in town were, as a rule, built close together and lining both sides of a side street or, if on the outskirts of town, arranged in clusters of from two to a dozen.

Seven of every eight agricultural households were located less than  $\frac{1}{4}$  mile from a public road, the percentage of laborers' households being a little larger than of operators'. Whether in the open country or in town, laborers' households were often located by irrigation canals and most usually at the intersection of a public road or street.

#### LOCATION OF HOUSEHOLDS IN RELATION TO THE FIELDS

Location of households in relation to the fields of employment was considered entirely in terms of minutes rather than miles. Excepting in small areas of the western part of the Safford Valley and on the western and northwestern limits of irrigated lands in Maricopa County, the most distant fields were reached by laborers and operators in 20 minutes or less, whether they lived on the farm or in town. This maximum time-distance was determined in terms of automobile travel on farm lanes as well as on public highways at the rate of from 20 to 30 miles per hour. Although location on farms implied nearness to the fields, there were slack seasons during which laborers that lived on farms traveled some distance to find work on other farms. Laborers in towns were generally farther from the fields than laborers on farms, but not always.

#### LOCATION OF HOUSEHOLDS IN CLUSTERS

While town location carried the implication of nonsolitary residence, farm location of agricultural households was by no means always solitary. An even 42 per cent of all resident laborers' households were located in clusters on farms, clusters containing from two to twelve or fifteen households, while migratory laborers' households were often found in camps of from

twenty-five to fifty households. Federal migratory laborers' camps contained as many as 290 households clustered in units of forty or fifty households. Farm operators' households were located in clusters of households to a lesser extent than laborers', the percentage being 37.

Some clusters were composed entirely of laborers' households, while a small number were composed only of operators'. Generally, the clusters contained an operators' household and one or more laborers' households.

Clustered agricultural households on farms were relatively most numerous in the Salt River Valley and solitary households in the Yuma Valley.

Thus the general pattern of location of agricultural households, while following the traditional Middle Western idea of living on farms, contained town residence as an important feature. Living on farms was solitary residence only to a limited extent since so many farm households were located in clusters. Among all farm households only a small percentage lived at some distance from public highways, while among town households few were found on the business or main streets of town. So it was that, while convenient to the fields from which the livelihood came, they were also close to one another. In all, town and clustered residence claimed more than three fourths of all resident laborers' households and two fifths of all operators' households.

#### DISTRIBUTION OF HOUSEHOLDS OVER IRRIGATED LANDS

Numbers of agricultural households per square mile of irrigated land decreased westward across Arizona, although hired laborer requirements increased westward. From 26.0 households per square mile in Township 7 South, Range 27 East, at the eastern end of the Safford Valley, household density fell to 8.0 households per square mile in Township 9 South, Range 24 West, the central part of the Yuma Valley. Between these extremes stood Township 1 North, Range 1 East, lying west of Phoenix, with 16.4 agricultural households; and Township 2 North, Range 1 East, lying northwest of Phoenix, with 11.8 households; while other sample townships showed a greater or lesser density. These differences in the numbers of agricultural households per square mile of irrigated land were largely due to certain social rather than economic factors among which were: (1) the general location of the irrigated area along the course of population movement westward, the earlier settlements having occurred in the eastern valleys; (2) the attitudes of different groups of settlers toward one another, whether of tolerance or of marked antagonism; (3) farm operators' attitudes toward laborers as settlers in their localities, whether those of mild neighborliness or of opposition to any form of settlement; (4) prevalence of farm residence to the exclusion of town location of households, or considerable town residence; and (5) the presence of different racial or cultural groupings.

## COMPOSITION AND CHARACTERISTICS OF AGRICULTURAL POPULATION

## AGE AND SEX AS INDICATORS OF SOCIAL CHARACTERISTICS

Age and sex composition reveal social characteristics of first importance in a population. A comparison of the political ideologies of California and Iowa by no means leads one to the conclusion that the latter state has entirely been the loser in the movement of part of its population westward. Without question the concentration of oldsters in California has not proved to be an unmitigated blessing to the golden state. They have swiftly absorbed the local atmosphere and intend to do some plucking for themselves. Similarly, sex composition may affect a population adversely or work to its advantage. Negroes are more acceptable to Arizona communities than Filipinos, although their racial disadvantage is great. The reason is plain enough. Negroes come in with a population of males and females, while Filipinos have no women of their kind. So illustrations might be multiplied to show the varied and intricate ways in which a study of the age and sex compositions of populations help to explain their social characteristics.

Agricultural population data showing composition and characteristics, used for the purposes of this study, were largely drawn from schedules obtained in field studies. This was done because the field studies were of more recent dates than the decennial population census and because, as has heretofore been indicated, census tabulations of the total population are made on the basis of place rather than occupation, while occupational statistics are concerned with special age groups, only, and not with the total population.

## ARIZONA RURAL FARM POPULATION CLASSIFIED BY AGE AND SEX

Arizona's rural-farm population classified by age and sex more nearly represented the agricultural population of the state than any other class that appeared in the census, although it included population on farms that had no connection with agriculture and excluding population in rural towns that was without doubt agricultural. This population when classified by age was very much like farm population throughout the United States.<sup>11</sup> From a broad base representing the younger persons under 5 years of age, it assumed the shape of a pyramid with concave sides (Fig. 3). This indicated some deficiency in the numbers of those aged from 25 to 44 or thereabouts, which was to be expected as a result of migration from farms to cities of those in the middle years of life. The significant variation from pattern was found in the relatively broader base of the Arizona rural-farm pyramid as compared with the rural-farm pyramid for the United States as a whole. Thirteen per cent of Arizona's rural-farm population

<sup>11</sup> *Fifteenth Census of the United States, 1930, Population Volume.*

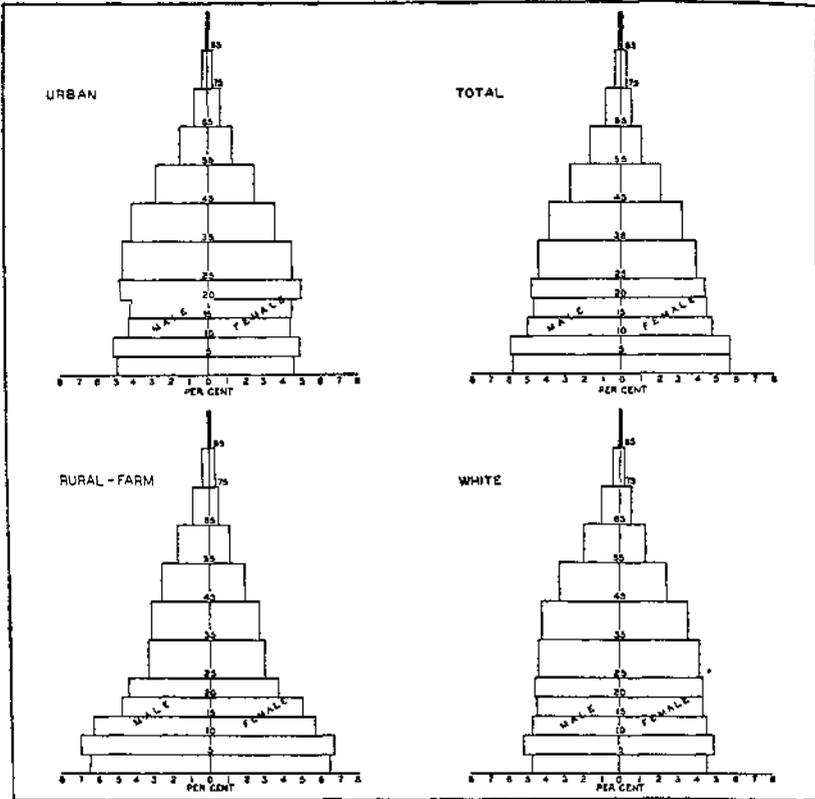


Figure 3.—Arizona population pyramids.

were under 5 years of age as compared with 11 per cent of the rural-farm population throughout the country; and 14 per cent of the Arizona population were aged from 5 to 9 years as compared with 12.5 of the rural-farm population of the United States. Arizona's urban population, as would be expected, contained relatively fewer children than the rural-farm population. Only 9.5 per cent were under 5, and 10 per cent aged from 5 to 9 years.

#### AGRICULTURAL POPULATION CLASSIFIED BY AGE AND SEX AND BY TENURE

Turning to the agricultural population on farms and in rural towns in the irrigated valleys of Graham, Maricopa, Pinal, and Yuma counties, it was found that among the whites, the white farm laborer population produced the most "balanced" pyramid of any of the agricultural populations (Fig. 4). Both resident and migratory white laborers' populations were combined. At the base of the pyramid were those under 5 years of age, an even 15 per cent of the total. Another 13 per cent were aged from 5 to 9,

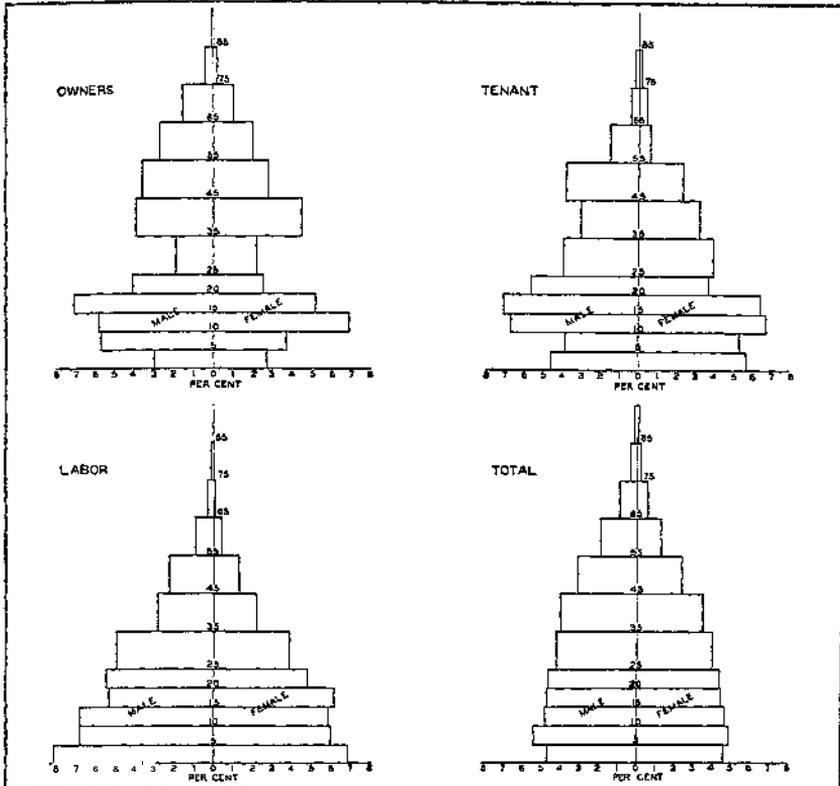


Figure 4.—White agricultural population pyramids.

and an additional 13 per cent were from 10 to 14. In all, a little more than 40 per cent were under 15 years of age, an age distribution described by Ross as indicating an extremely prolific people.<sup>12</sup> Of course it has not been forgotten that the population of an occupational or tenure class constitutes only part of the total population of a given region or of a people.

White farm owners and managers headed a population from which a great part of the younger adults had been drawn by migration and marriage. The distribution of persons above 34 years of age occurred as a pyramid, but among persons of 34 and less the age distribution was very irregular (Fig. 4). Shortages in numbers were most evident among persons of from 20 to 34 years of age and persons under 10. Persons from 20 to 34 accounted for only 15 per cent of the population, which was a little more than

<sup>12</sup>E. A. Ross, *Principles of Sociology* (The Century Company, 1920), p. 8.

one half of the percentage of persons in the same age groups in the total white population of these counties. Persons under 10 made up only 15 per cent of the population as compared with 20 per cent in the total white population and 28 per cent in the population headed by white laborers. The shortage of children in this land-owning population was very largely due to the fact that offspring in many households had grown up and gone from home.

The population in white tenants' households more nearly assumed the shape of a pyramid than that of other farm operators (Fig. 4). While definitely short of children under 10 as compared with laborers, it came very near in percentage to the proportions under 10 in the total white population in these counties. It contained a larger percentage of persons from 10 to 19 than the population of any other agricultural class and, in that respect, far surpassed the total white population in these counties.

Since so many heads of laborers' households were Mexican or Indian, their total numbers were divided into four populations—white, Mexican, Yaqui, and migratory white (Fig. 5). The pyra-

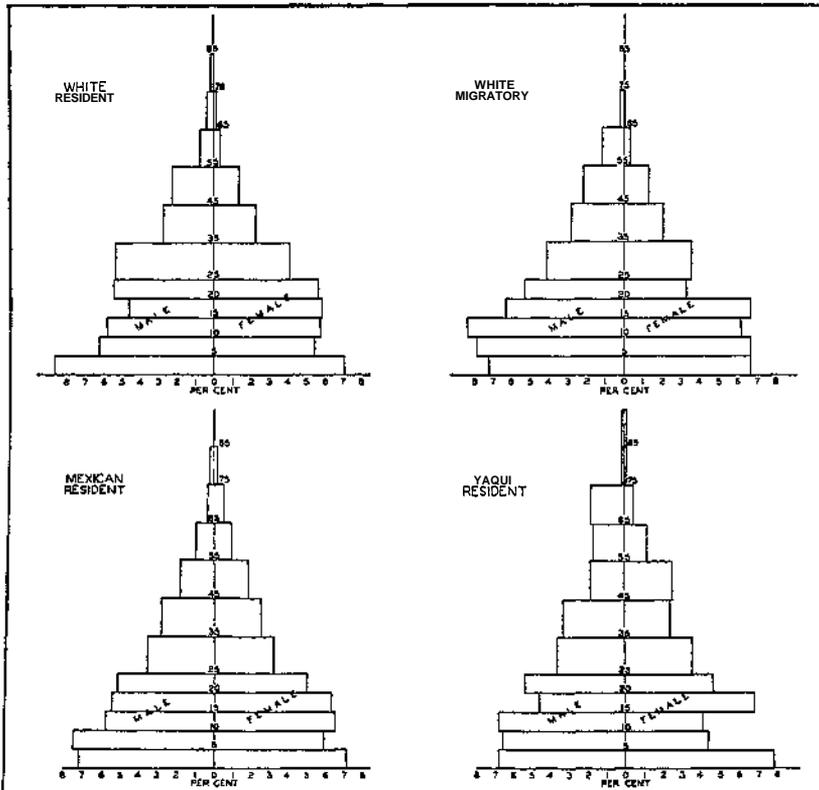


Figure 5.—Agricultural population pyramids among laborers.

mid composed of the Mexican laborer population rose from a base which included 14 per cent of the population and tapered through the age intervals toward the apex, the sides describing a slightly concave line. The resident white laborer population pyramid had a base which included 16 per cent of its total, but tapered somewhat suddenly through the 5 to 9 and 10 to 14 age classes. Migratory white laborers' lower age groups were well filled. So it was that the two white laborer populations combined made a symmetrical demographic figure, as was shown earlier in the discussion. The Yaqui Indian laborer population pyramid, much like the Mexican, rested on a base which included 15 per cent of the total. Unlike the Mexican, however, this population was deficient in persons aged from 5 to 14. Like the white laborers' populations, both resident and migratory, it showed an excess of persons aged from 25 to 34 years.

#### SEX RATIOS IN THE AGRICULTURAL POPULATION

Arizona's excess of males over females reflects recent pioneer influences as well as the influence of farming, ranching, and mining industries. In the state as a whole there were in 1930, 113.2 males to 100 females which was far in excess of the 102.5 per 100 ratio which obtained throughout the country as a whole. Arizona's urban population, unlike the urban population of many states, exceeded in males, the ratio being 104.9 to 100 females. In the urban centers of the United States there were but 98.1 males to 100 females. Rural-farm population in Arizona was strongly male, the ratio being 116.0 to 100 females, while throughout the United States the ratio was 111.0 to 100. That Arizona whites contained a higher sex ratio than other racial groups in the state was shown by the ratio of 116.0 white males to 100 white females.

In the farm counties whose agricultural populations were especially analyzed, the white laborer population contained more males than any other class. Coming second were white owners and managers, and third were white tenants. Numbers of males per 100 females were, respectively, 119.6, 116.5, and 109.4. The entire white population of these counties contained 112.3 males per hundred females, a proportion somewhat lower than the average for the state largely because of the population of Phoenix which was included in the total.

Among agricultural laborers the highest sex ratio was found in the migratory white population, resident white laborers coming second. Their ratios were 126.8 and 114.1 to 100. These ratios not only reflected the influence of agricultural employment but in the high ratio of the first named group was reflected the selective influence of migration. On the other hand, sex ratios were relatively low in the Yaqui and Mexican populations, there being 105.8 Yaqui males to 100 females and 102.0 Mexican males to 100 females. Of all agricultural populations, the Mexican laborer population showed the least effect of selectivity through the movement of people.

While the excess of males in Arizona's total population was evident in every age classification, it was more evident in the classes above 20 and most marked in the classes above 35 (Fig. 3). In Arizona's rural-farm population, males exceed females in numbers throughout all age classifications, while those aged 45 and over far exceeded females of corresponding ages. Urban population, as might have been expected, contained more females than males in some age classes. Females were in the majority among persons aged 10 to 14, 15 to 19, and 20 to 24 (Fig. 3).

Among the various agricultural populations, females exceeded males in some age classes, although generally males were in the majority. Females exceed males in the resident white laborer population aged 15 to 19, and 20 to 24; in the Mexican laborer population aged 10 to 14, 15 to 19, 45 to 54, and 65 to 74; among the Yaquis under 5, 15 to 19, and 45 to 54; among migratory white laborers 15 to 19 (Fig. 5); among the white tenant population under 10, and from 35 to 44; and among owners' and managers' population aged 10 to 14, 25 to 34, and 35 to 44 (Fig. 4). An excess of females under 5 was contrary to the usual ratio, since a somewhat greater number of male infants are born than female. A greater mortality rate among male infants tends to equalize the numbers of males and females. It is probable that the excess of female infants in small populations was incidental. On the other hand an excess of females in any of the age groups below 45 among agricultural populations deserved attention since as a general rule migration to cities drained these populations of their females to a greater extent than males.<sup>13</sup> Apparently young women of Mexican, Yaqui, and white migratory parentage did not migrate to towns and cities to any great extent. Migrations cityward took place among white farm young women to a greater extent than among farm young men as was indicated by the excess of females aged from 10 to 24 in the urban population.

#### PROPORTIONS OF NATURAL DEPENDENTS IN THE AGRICULTURAL POPULATION

Since dependency has been chiefly associated with age, it may be said of any given population that a study of its age composition is a first step in dealing with problems of unemployment, and in administering public and private assistance. In other words, the ability of a population to be self-supporting depends, to a considerable extent, upon the age distribution of its members.

The dependents in a population are composed very largely of children below employment age and aged persons who have passed the years of gainful employment. A conservative estimate of the extent of natural dependency was made by totaling the persons in age classifications below 15 and those persons of 65 years and over.<sup>14</sup>

<sup>13</sup> J. H. Kolb and E. de S. Brunner, *A Study of Rural Society* (Houghton-Mifflin Company, 1940), p. 246.

<sup>14</sup> C. E. Lively and R. B. Almack, *The Rural Population Resources of Missouri* (Mo. Agr. Exp. Sta. Res. Bull. 306, Columbia, 1939), p. 24.

In a growing population such as that found among migratory white laborers, 43 per cent of all persons were under 15 (Fig. 5). These comprised practically all of the natural dependents, since only one half of 1 per cent of the persons in this population were 65 years of age and over. Natural dependents in the Mexican laborer population accounted for 43 per cent of all persons, 40 per cent being under 15 years and 3 per cent being 65 and over (Fig. 5). Resident white laborers and Yaquis had persons in the dependent ages to the extent of 40 per cent (Fig. 5). An even 39 per cent of the white laborer population and 36.5 per cent of the Yaquis were under 15, while 1 and 4 per cent were 65 years or older. White tenants and white owners and managers came next. They headed populations in which 35 and 34 per cent of all persons were under 15, or 65 and over. The white tenant population was 33 per cent, and the owner and manager population 28 per cent under 15. While the tenant population contained 2 per cent of its persons who were 65 years and over, the owner and manager population had more persons in these advanced years than any other agricultural population. The percentage was 6 (Fig. 4).

In brief, it was found that the population which contained the greatest percentage of children under 15 also contained the greatest percentage of natural dependents; while, in contrast, the population which contained the greatest percentage of persons aged 65 and over contained the smallest total percentage of natural dependents. This conclusion was supported by the results of a comparison of rural-farm and urban populations in Arizona as a whole. Whereas 39 per cent of rural-farm persons were in the years below 15 as compared with 28 per cent of the urban population, the higher percentage of natural dependents appeared among rural-farm persons. The significant differences respecting numbers of natural dependents appeared in the lower age groups. Arizona's experience in public assistance should be studied in relation to the age composition of the various populations that have been on the public relief rolls.

#### IMPORTANCE OF AGRICULTURE AMONG GAINFUL OCCUPATIONS

The importance of the agricultural population in connection with the question of self-support in Arizona was shown in a tabulation of the numbers of gainful workers 10 years of age and over in each of the major occupations. Twenty-three per cent of Arizona's 165,296 gainful workers as reported in the census of 1930 were engaged in agriculture. Manufacturing, trade, domestic service, and extraction of minerals, in the order named, were of next importance in the numbers of gainful workers reported (Table 9).

Among 135,325 male gainful workers, 27 per cent or more than 36,500 were in agriculture, with manufacturing, trade, extraction of minerals, and transportation ranking next in the order named. Female gainful workers, numbering a little less than 30,000, were chiefly to be found in domestic and personal service. Next in

TABLE 9.—GAINFUL WORKERS 10 YEARS OF AGE AND OVER CLASSIFIED BY OCCUPATION AND SEX.\*

Occupation	Number of gainful workers			Per cent		
	Male	Female	Total	Male	Female	Total
Agriculture .....	36,511	1,912	38,423	27.0	6.4	23.2
Mfg. and mech. ind.....	30,491	4,213	34,704	22.5	14.1	21.0
Trade .....	16,771	3,038	19,809	12.4	10.1	12.0
Dom. and personal ser...	6,469	10,405	16,874	4.8	34.8	10.2
Extraction of minerals.....	13,973	9	13,982	10.4	†	8.5
Transportation and com.	13,274	598	13,872	9.8	2.0	8.4
Professional service.....	7,044	5,572	12,616	5.2	18.6	7.6
Clerical occupations.....	5,189	4,078	9,267	3.8	13.6	5.6
Public service .....	4,794	146	4,940	3.5	0.4	3.0
Forestry .....	809	0	809	0.6	0.0	0.5
Total.....	135,325	29,971	165,296	100.0	100.0	100.0

\* *Fifteenth Census of the United States, 1930*, Population Volume IV, pp. 141-42.

† Less than one tenth of 1 per cent.

TABLE 10.—GAINFUL WORKERS IN AGRICULTURE, 10 YEARS OF AGE AND OVER CLASSIFIED BY AGE AND SEX.\*

Age classification	Number of gainful workers			Per cent		
	Male	Female	Total	Male	Female	Total
10 to 17 .....	2,043	501	2,544	5.6	26.3	6.6
18 to 19 .....	1,928	123	2,051	5.3	6.4	5.3
20 to 24 .....	4,850	178	5,028	13.3	9.3	13.1
25 to 34 .....	7,934	228	8,162	21.7	11.9	21.3
35 to 44 .....	7,282	301	7,583	19.9	15.8	19.8
45 to 54.....	6,208	297	6,505	17.0	15.5	16.9
55 to 64.....	3,985	177	4,162	10.9	9.3	10.8
65 to 74.....	1,789	83	1,872	4.9	4.3	4.9
75 and over.....	458	20	478	1.3	1.0	1.2
Unknown.....	34	4	38	0.1	0.2	0.1
Total.....	36,511	1,912	38,423	100.0	100.0	100.0

\* *Fifteenth Census of the United States, 1930*, Population Volume IV, pp. 141-42.

order of importance came professional service, manufacturing, clerical work, and trade. Agriculture ranked sixth in importance among female workers (Table 9).

Changes since 1930 in the numbers of gainful workers in the various occupations have most likely not lessened the relative importance of agriculture. It is not at all improbable that agriculture's relative strength may have increased somewhat. This was suggested by the results of the 1935 census of agriculture which showed 47,807 workers on farms including family labor and hired labor working the equivalent of 2 or more days during the first week in January. While this figure was larger than would have been obtained on April 1, the date of the 1930 enumeration, since Arizona's cotton crop was still in the picking during

January, it is improbable that the difference of more than 11,000 gainful workers as between the totals for 1930 and 1935 could thus be totally accounted for. More than likely there have been increases since 1935 as well, since several thousand workers that in former years returned to Texas, Oklahoma, and other states at the close of the cotton picking season, have remained in Arizona and in other far-western states. Preliminary returns of the 1940 census show important population increases in the agricultural counties.

PERCENTAGES OF GAINFUL WORKERS IN AGRICULTURE BY AGE CLASSIFICATIONS

Twelve per cent of Arizona's gainful workers in agriculture were under 20 years of age, between 6 and 7 per cent being from 10 to 17. Six per cent were 65 years old and over, a little over 1 per cent being 75 and over. Thus 82 per cent were in the years of from 20 to 65, and 18 per cent were below or above these limits—that is, in the years of natural dependency.

Gainful workers in agriculture were given a special analysis by sex and age classifications in comparison with gainful workers in other occupations. Agriculture accounted for more than one half of the 4,006 male gainful workers aged 10 to 17 years, and for 46 per cent of the 995 workers aged 75 and over (Fig. 6). Between these limits agriculture's importance among the occupations decreased sharply among male workers aged from 17 to 34 years and increased gradually among those from 35 to 75 and over. The ends of the percentage bars showing the age distribution of gainful workers in agriculture described a convex curve which resembled a parabola.

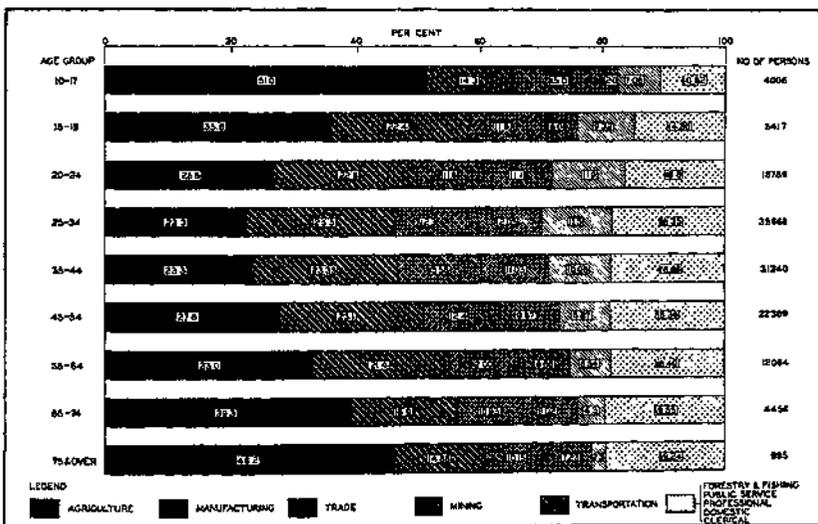


Figure 6.—Arizona male gainful workers classified by age and occupation.

Among other occupations the pattern of age distribution of gainful workers was quite the opposite of the pattern just described for agriculture. The percentages in each age classification from 10 to 34 increased and from 35 to 75 and over decreased among male gainful workers in manufacturing, mining, and transportation. Thus the ends of the percentage bars, assuming arrangement on a base line, described a convex curve that was pretty much skewed to the left. Trade favored gainful workers aged 10 to 17 and 35 to 44 years (Fig. 6).

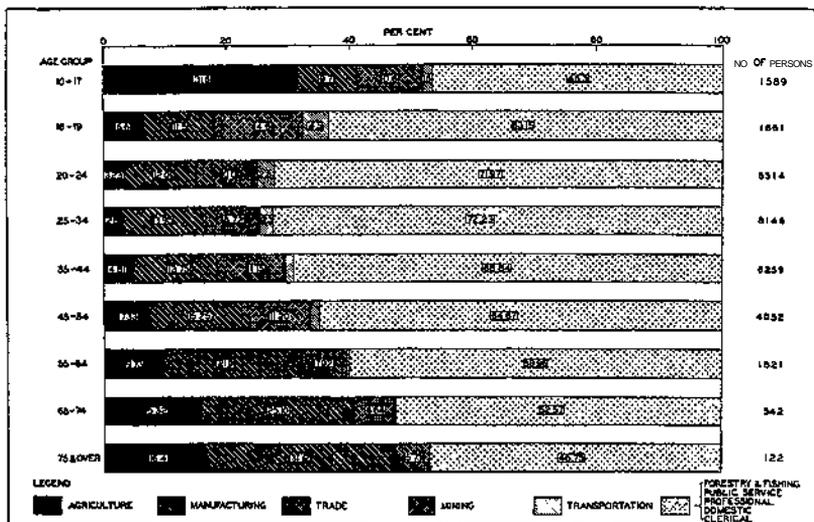


Figure 7.—Arizona female gainful workers classified by age and occupation.

Female gainful workers in agriculture, when classified by age and compared with female workers in other occupations, occupied a rather small place in the total picture. Of 165,296 female gainful workers in all occupations, only 1,912 were workers in agriculture (Fig. 7). Their percentage distribution by age classes, however, when compared with workers in other occupations, closely resembled the distribution of male gainful workers. While almost one third of the female gainful workers aged 10 to 17 years was in agriculture, less than 7 per cent of those 18 to 19 and about 3 per cent of those from 20 to 34 years of age were thus classified. Among female gainful workers aged from 35 to 75 and over the percentages engaged in agriculture increased from 5 to 16. Most important of the occupations among female workers were domestic service, professional service, manufacturing, clerical work, and trade (Fig. 7).

Thus, male gainful workers dominated the scene in agriculture, mining, forestry, manufacturing, and transportation, the basic

occupations concerned largely with the creation of elementary, form, and place utilities. And most numerous of these were the workers in agriculture. Fortunately for the cause of a self-supporting population, agriculture furnished gainful employment for many who were in the years of natural dependency—either too young or too old to be accepted in other major occupations.

#### AGRICULTURAL POPULATION DENSITY

Agriculture's hired labor requirements as a whole exceed the man power available from the resident agricultural population. This becomes most evident during the September-December season of each year. During September, 1937, more than 32,000 men were employed for wages on the farms of Arizona's four major irrigated areas. This was almost 12,000 more hired laborers than were resident on farms and in the rural towns of these areas. About 10,000 more hired persons were added during October and 3,400 more during November. The peak number of hired farm laborers was reached during November and amounted to 45,600 persons. This necessitated the addition of 25,200 hired persons to the resident supply of 20,400. These additional laborers came about as follows: 2,000 from Indian reservations; 3,000 from the larger towns and cities such as Glendale, Mesa, Phoenix, and Tucson; 2,000 from California with the passing of peak requirements there; and 18,000 from Texas, Oklahoma, Missouri, and neighboring states. When one adds to this total of 45,600 another 27,000 family workers throughout the state including working operators and unpaid family workers other than those doing housework and a few chores, it is plainly evident that the 72,600 gainful workers in the state at the season of peak requirements come from a very much larger agricultural population than the population represented by the 38,000 gainful workers reported by the census of 1930, or by the 47,000 workers counted in the census of agriculture for 1935. This numerical deficiency in the resident agricultural population is in process of being corrected by the prolonged stay in Arizona of migratory laborers' families, an adjustment that is not without its attendant problems, the discussion of which is beyond the scope of this study.

A previous analysis showed that the location of agricultural laborers' households bore only a general relationship to agricultural labor requirements and other commercial factors. Apparently other and noncommercial factors were important, among which were the location and growth of early settlements and the attitudes of resident agricultural people toward new settlers. These influences, however, were only a few among many that appeared to be important in the determination of location. It seemed necessary therefore to give attention to the question of agricultural population location as revealed by an observation of density in localized areas.

No attempt was made to obtain the agricultural population density in parts of agricultural Arizona other than the four major

irrigated areas. While census figures on the rural-farm population could have been used instead of the nonexistent figures on agricultural population, as was done earlier in this report, there were deficiencies in the data on land in farms that made it practically impossible to arrive at anything approaching dependable results. Attention was therefore concentrated on irrigated areas. Information both on agricultural population and on land in irrigated farms obtained in the field study of 1936 permitted a fairly accurate calculation of agricultural population density in the four major irrigated areas that were included. Looking upon the major irrigated areas as a whole there were 48.8 persons per square mile of irrigated farm land, 35.1 persons being in laborers' and 13.7 in operators' households.

Agricultural population density was highest in the eastern part of the Safford Valley and decreased westward. Irrigated farms in Township 7 South, Range 27 East lying east of Safford contained per square mile a total of 123.8 persons in resident farm laborers' and farm operators' households in the open country and in small towns. Density was greatly reduced in the Safford Valley as one moved westward toward Ft. Thomas. On the other hand, Yuma Valley irrigated farms in Township 9 South, Range 24 West contained per square mile on farms and in town some 35.2 persons. Density in the Salt River Valley ranged from 75.0 persons in Township 1 North, Range 1 East, including Tolleson, to 33.5 persons in Township 1 North, Range 6 East lying to the east of Mesa. Thus the area of greatest density in the Salt River Valley occupied a position that was midway between the density of the upper Gila and Yuma valleys, while the area of least density fell a little below the Yuma Valley figure. Density in the Casa Grande Valley ranged 37.7 to 17.5 persons per square mile of irrigated farm land. This uneven distribution of agricultural population in relation to land area was the result of the interplay of factors and influences no single one of which seemed to be the "main" factor (Table 11 and Fig. 1).

The high density of the agricultural population in the upper Gila Valley was associated with a relatively large farm laborer population, 102 of the 123 persons in the agricultural population per square mile being members of laborers' households. These were mostly of Mexican origin and were generally located in small towns. The presence of a population of Mexican origin in relatively large numbers was traceable to the influences of early settlement, the first settlers of European origin having come in from New Mexico and Mexico. These settlers were not greatly disturbed by a later influx of Mormon pioneers whose tolerance and self-sufficiency permitted the development of Mormon and Mexican towns side by side. Moreover the valley, desert, and near-by mountains provided a favorable opportunity for subsistence so that the relatively numerous settlers cultivated gardens and small farms, gathered wood for house construction and fuel, and found grazing for cattle and horses.

TABLE 11.—AGRICULTURAL POPULATION DENSITY,\* FOUR IRRIGATED AREAS, TEN TOWNSHIPS.

Description of sample township	Area and place name	Number of persons per square mile		
		In resident laborers' households	In operators' households	Total
T. 7 S., R. 27 E.	Upper Gila Valley, Safford	102.4	21.4	123.8
T. 1 N., R. 1 E.	Salt River Valley, Tolleson	59.0	16.0	75.0
T. 2 N., R. 4 E.	Salt River Valley, Scottsdale	40.5	18.6	59.1
T. 1 S., R. 4 E.	Salt River Valley, Kyrene	47.9	8.4	56.3
T. 2 N., R. 1 E.	Salt River Valley, Glendale	29.4	21.6	51.0
T. 1 N., R. 6 E.	Salt River Valley, Mesa	22.3	11.2	33.5
T. 1 S., R. 4 W.	Gila Valley, Buckeye	13.8	6.4	20.2
T. 9 S., R. 24 W.	Yuma Valley, Somerton	27.6	7.6	35.2
T. 8 S., R. 8 E.	Casa Grande Valley, Eloy	33.8	3.9	37.7
T. 6 S., R. 7 E.	Casa Grande Valley, Casa Grande	8.4	9.1	17.5
10 Townships..	4 irrigated areas	35.1	13.7	48.8

\*Based on information obtained in field study April 1, 1936, and covering resident population only. Migratory laborers' households were not included.

Next in density came the agricultural population in Township 1 North, Range 1 East, in which the town of Tolleson is located. Here were found 75.0 persons per square mile of irrigated land including those in towns. A large proportion belonged to laborers' households as was the case in the upper Gila Valley and likewise many of them were of Mexican origin. Here, however, unlike the upper Gila in which cotton was the one important cash crop, diversity of commercial crops largely accounted for the great numbers of resident laborers and special factors, such as land settlement of war veterans, for the considerable numbers of small holders. The fall and winter lettuce deals required labor as the cotton picking fell off, and haying, cantaloupes, and the small grain harvest came along in the spring and early summer. Dairying, too, occupied an important place in the agriculture of this area (Table 11 and Fig. 1).

Grapefruit and orange orchards, date orchards, vineyards, nurseries, and cotton and alfalfa in the fiat valley lands characterized the Phoenix Mountains foothill area which included Township 2 North, Range 4 East and contained the small town of Scottsdale. About one third of the agricultural population was in operators' households and two thirds in laborers' households, a considerable part of the latter being in town and, as in other areas of high density, it included many Mexicans. There were 59.1 per-

sons per square mile. The suburban character of a great part of this area had as much to do with the high agricultural population density as any other single influence (Table 11 and Fig. 1).

Similar in density (56.3 persons per square mile) but unlike in the proportions of operators' and laborers' households was the Kyrene area—Township 1 South, Range 4 East—including the Kyrene school district, the Indian town of Guadalupe, and several permanent Mexican laborers' camps. Several large alfalfa and livestock farms occupied by foremen and laborers only on the one hand and the large Indian and Mexican population on the other largely accounted for the high percentage of laborer population as compared with persons in operators' households. Contributing to the support of this laborer population were the labor requirements of a belt of citrus farms along the base line road which formed the northern boundary of the township. While this belt extended only 2 miles along the edge of the township, laborers found employment some distance farther to the west (Table 11 and Fig. 1).

The two remaining areas in Maricopa County had agricultural population densities of less than forty persons per square mile. Township 1 North, Range 6 East had a well-distributed population of 33.5 persons per square mile, one third of them being in operators' households and two thirds in laborers' households. Citrus fruits and cotton were the principal commodities produced for the market, and white laborers were more numerous than in the areas of greater population density. The Buckeye area lying west of the Salt River Valley, including Township 1 South, Range 4 West, on the Gila River showed a still lower density. Of 20.2 persons per square mile a little less than one third were in operators' and two thirds in laborers' households. Alfalfa and alfalfa seed, the latter being produced on account of the scarcity of irrigation water, were the principal commodities. Many laborers in this area were native white (Table 11 and Fig. 1).

Passing westward to Township 9 South, Range 24 West in the Yuma Valley, in which there were 35.2 persons per square mile, four persons out of every five belonged to laborers' households. These laborers' households contained a larger percentage of native white population than was found among laborers in any other area (Table 11 and Fig. 1).

Agricultural population in the Casa Grande Valley ranged from 17.5 persons in Township 6 South, Range 7 East to 37.7 in Township 8 South, Range 8 East. The first named area was located between the towns of Coolidge and Casa Grande, while the other included the town of Eloy and extended southward. About nine tenths of the persons in the more densely populated Eloy area were in the laborers' households, while in the area of low density, lowest of all areas studied, the population in laborers' households was slightly smaller than that in operators' households. Truck crops, cotton, and alfalfa were produced in the Eloy area, while cotton with some alfalfa was grown in the area between Coolidge and Casa Grande (Table 11 and Fig. 1).

## CHARACTERISTICS ASSOCIATED WITH VARIATIONS IN DENSITY

Making a general comparison of these areas with respect to agricultural population density, it was true on the whole that population density varied directly with the percentage of the agricultural population found in laborers' households, the higher the percentage of laborers the greater the density of population. Moreover, the presence of Mexican households in the laborer population still further increased density, since they not only had large households but the households were in most instances closely clustered together. Laborers of Mexican origin composed 87 per cent of all laborer heads of households in the upper Gila area, 50 per cent in the Salt River Valley, and 34 in the Yuma Valley, the percentages decreasing westward as did population density. Also, looking upon the several areas of the Salt River Valley, diversity of farm commodities went along with population density. Diversity on individual farms characterized the family farms of the upper Gila Valley and of the Glendale and Scottsdale areas, while area diversification with specialization of commodities by farms was found in the Tolleson area and in the Glendale area, just mentioned for its farm diversification. Suburban residences on farms occupied by professional and well-to-do people also brought increases of the laborer population on small holdings in addition to that of the owners' households and thus added to the numbers of persons per square mile. Town location of agricultural population went along with greater density as was shown by a comparison of the major irrigated areas, the greater the percentage of agricultural households in town the greater the agricultural population density. Town residence, in turn, was related to the requirements for seasonal laborers in a given area, the greater the time concentration of seasonal laborer requirement the higher the percentage of the agricultural population in towns.

## FACTORS ASSOCIATED WITH THE LOCATION, COMPOSITION, AND CHARACTERISTICS OF THE AGRICULTURAL POPULATION

Physically Arizona is roughly divided into two parts. The part lying to the north and east of a line connecting the Gila River at the point of its entry into the state with Boulder Dam to the northwest is sparsely peopled (Fig. 1, map of Arizona). To the south and west of this imaginary line are the major irrigated areas that have been given special attention in this study. The subtropical irrigated valleys produce cotton, truck crops, and other commodities that require much hand labor and therefore support a relatively dense population. In the same valleys citrus and date orchards offer an unusual setting for suburban residence thus increasing the numbers of middle-class people on the land. Alfalfa and grain fields and livestock in large numbers afford an additional base for population support. The higher range areas which lie largely to the north and east support a sparse popula-

tion with here and there a community of high density, the small irrigated farms being watered by means of a local irrigation enterprise.

Another complex of influences may be known as the technological factor. Imposing organizations of engineering talent, backed by large amounts of capital, have made possible the great reservoirs and the systems of canals and ditches as well as power plants and lines necessary for storing, transporting, and distributing water for irrigation. This has been done with public and private promotion and supervision. Thus, populations of increasing numbers have been made possible in the major valleys of Arizona. Additional increases are promised in southwestern Arizona by the diversion of new waters from the Colorado River, whose controlled stream system has become one of the notable accomplishments of this century (Fig. 1, Yuma County proposed irrigation area).

Private capital has been indispensable in getting a population established on the land. With its use new lands have been cleared and leveled for irrigation, new wells have been sunk and pumps installed, new crops and cattle breeds have been introduced, improved machines have been bought for cultivation and harvesting, larger processing and packing plants for agricultural commodities have been erected, and the construction of power plants, and other irrigation and power structures has been financed.

Science applied to agriculture has transformed the Arizona scene. In the short span of 50 years a scanty agriculture has been developed until its commodities bring in \$50,000,000 in cash per year.<sup>15</sup> The tale of the introduction and development of new field crops, new animal strains, improved cultural methods; of the investigation of irrigation waters, sediments, and soils; of the control of pests and blights; and of other achievements has been well told in a recent University of Arizona publication.<sup>16</sup> One's imagination readily pictures the essentially dramatic sweep of this development, and, with little effort, adds the concomitant incoming of new families to meet the requirements and enjoy the fruits of the new agriculture. Probably science's greatest contribution toward the establishment of a permanent agricultural population on the land was to add a remarkable degree of certainty and of stability to Arizona's agriculture and to bring increase to the farmer's returns for his labor.

Entrepreneurship may without question be recognized as the most seriously limited of the factors of agricultural production.<sup>17</sup>

<sup>15</sup> George W. Barr and Howard E. Baker, *Arizona Agricultural Situation, 1940* (Ariz. Agr. Ext. Serv.).

<sup>16</sup> P. S. Burgess, R. H. Forbes, J. J. Thornber, and R. S. Hawkins, *Fiftieth Annual Report of the Arizona Agricultural Experiment Station*, published April, 1940.

<sup>17</sup> Dr. Hibbard, some 20 years ago, was saying to his students in regard to the intensity of cultivation of land ". . . it may very safely be stated that entrepreneurship is the most definitely limited of any factor . . ." See B. H. Hibbard, *The Quarterly Journal of Economics*, Vol. XXXVI, August, 1922.

The number and variety of farm operators who exercise the function of entrepreneurship must not, however, blind our eyes to the importance of the decisions they make regarding the proportions of land, water, labor, and capital equipment used on their farms. Thus each individual farmer in planning his operations determines the number and, to some extent, the kind of people that will be employed on his farm. The sum total of farm operators' decisions in a given area without question goes far toward accounting for the numbers and kinds of laborers in that area, and the extent to which their employment is regular or sporadic. These decisions also go far toward determining the number of operators that will be found in the area since they are concerned with acreage per farming unit and the size of operations as well as the amount of labor to be employed.

Workmanship has played an important part in the determination of the size and quality of the agricultural population. High standards of industry and achievement among laborers have made agriculture profitable and have extended the demand for qualified laborers at any given established technological level in the use of labor and equipment. In periods of transition, with shifts in the nature of labor demand, workmanship has appeared to decline in importance since admittedly good workmen were not employed, but readjustments on new levels brought forward new requirements, within the range of which competition was once more established. Only a monopoly control of labor has prevented the operation of this factor in urban industry but such influences have not far penetrated Arizona's agriculture.

The direction and routes of population migration have played a part in the location of agricultural population in Arizona. Apparently all but the habitual migrants seek new locations as they travel and the greater numbers travel only till they find a place in which to settle.

Competitive opportunities in nonagricultural industries have more or less drained off part of Arizona's agricultural population, while lack of openings in other industries has retarded and, so to speak, held back the normal population flow away from the farm. While this backing up of the agricultural population has taken place among all tenure and occupational classifications in agriculture, it is reasonable to conclude that the upper occupational levels have thus been subject to a greater return pressure than the lower levels. This is true because it has been from these levels that migrants have most easily passed into nonagricultural occupations such as business proprietorships and the professions. Since Arizona's farm owner and manager population has furnished city migrants to a greater extent in proportion to their numbers than the laborer population, during boom times, it follows that this population has been most affected by the return flow from the cities during depression times, and by retardation in the flow cityward. On the other hand, the population in the lower occupational levels has suffered most because of continued congestion due to lack of a chance to get away.

Social systems have been an ever potent factor in agricultural population growth. Organized thought and sentiment regarding the desirability of family life and of children have had a great deal to do with the numbers of children born in a population. For example, this factor has been important in determining the population density of the upper Gila Valley. Mormon farmers on the one hand and Mexican farm laborers on the other have held firmly to a desire for family life with children, and their church organizations have fostered that way of living. The incoming white migratory population has long known a strong family organization.<sup>15</sup>

Thus, the many and far-reaching influences that have been associated with the development of Arizona's agricultural population have, in a necessarily simplified form, been presented as ten major factors. The physical and technological factors have largely determined the possibility and feasibility of an agricultural base for the support of the population; private capital with governmental assistance has furnished the materials and labor for the physical structures for irrigation, implements, and machinery for the farm; and science has vastly improved plants, animals, and farm practices and brought certainty and stability to the population on farms. Governmental regulation has aimed to guard and preserve agriculture's resources in land and water. Entrepreneurship and workmanship have operated on individual farm units, the one to steer the course of agriculture and thus of agriculture's population requirements, the other to give substance and realization to plans for agricultural returns. Migrants in and out of Arizona have followed the main roads whose direction and route location have had something to do with the geographic distribution of the population as it settled itself in new locations. Employment opportunities, factories, and other nonagricultural industries, and in businesses, as well as openings in the professions, have taken part of the population from the land and during hard times returned some of it to the land; while deep-rooted social systems have protected and nourished the family and encouraged offspring to replace the old and the feeble and to replenish the outflowing stream to the cities.

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<sup>15</sup> C. C. Zimmerman and M. E. Frampton, *Family and Society* (D. Van Nostrand Company, 1935), Chap. XV.

## DEFINITION OF TERMS

**Resident laborer.**—The term "resident laborer" as used throughout this study applies to laborer heads of households and the population in these households that were in Arizona on April 1, 1936. This was the date as of which the information in the field schedules was obtained. It was a time when farm laborers from outside of Arizona were least numerous.

**Migratory laborer.**—The term "migratory laborer" is applied to laborer heads of households and the population in these households who had lived in Arizona less than 3 years and who were in Arizona on March 15, 1940. The practical criterion which distinguished migratory farm laborer households was their ineligibility for general and categorical forms of public assistance in Arizona as defined by Arizona statute.

**Change in residence.**—The term "change in residence" as used in this study involves moving outside the limits of the town in which the head of the household previously lived; or outside of the township, if he lived in the open country; as well as from town to open country and from open country to town. In the case of a family's movement from place to place any stop of 6 or more days is defined as "residence." The date of moving to one place is the date of moving from the last preceding one.

**Change in occupation.**—"Change in occupation" is defined as leaving one kind of work for another which requires more skill or less skill and/or pays higher or lower wages than the occupation at which the person has been previously employed; each change in location of work and employer; each change from farm laborer or foreman to farm tenant, owner or manager, or vice versa; considering as unemployment each layoff or other period without work of 4 weeks or more, except in cases of injury or illness in which a person returned to his former employment as soon as he had recovered.

**Household.**—A "household" is defined as a group of related or unrelated persons who live together as a unit.

**Family.**—A "family" consists of husband, wife, and his, her, or their children, or of either parent with single (never married) children. "Children" include own children, stepchildren, or foster children. A household is usually composed of one family and often contains also one or more related or unrelated persons.

**Head of the household.**—The "head" of the household is the head of the family in all cases where the household contains only one family. In the case of married couples with or without children, the husband is head except when he is over 69 years of age and is living with a child between the ages of 21 and 69 who is not a member of another family in the household. In such a case the child is head. In the case of two or more families in one household, the oldest family head is designated as head keeping in mind the exception given above. In the case of widowed, divorced, or separated persons with children, the parent is designated as head, except when he or she is over 69 years of age and living with a

child between the ages of 21 and 69, not a member of another family in the household. In other cases, the person with the largest earnings or property rights is designated as head. In cases in which qualifications are apparently equal in two or more persons, preference is given to the elder or eldest and to the male person.

**Color or nativity.**—All persons born in Mexico or having parents born in Mexico and who are not definitely white, Negro, Indian, Chinese, or Japanese are reported as Mexican. Spanish-Americans of the white race whether born in the United States, or Mexico, or some other country in the western hemisphere were reported as white.

All persons believed to have any Negro blood are reported as Negro.

**Age.**—“Age” is recorded in years of each person on his last birthday on or preceding the date as of which the survey was made.

**Occupation.**—An “occupation” is a job for which a person receives money or money equivalent or regular work in the production of marketable goods. The latter does not include incidental chores or housework. It does not include work relief or a job provided as an emergency unemployment measure.