

HB
3525
.J8
A5
1935

*Planning
Past*

PAST AND FUTURE GROWTH AND STRUCTURE OF THE IOWA POPULATION

STATE LIBRARY COMMISSION OF IOWA
Historical Building
DES MOINES, IOWA 50319

IOWA STATE PLANNING BOARD
COMMITTEE ON POPULATION AND SOCIAL TRENDS
MARCH, 1935

PAST AND FUTURE GROWTH AND STRUCTURE
of the
IOWA POPULATION

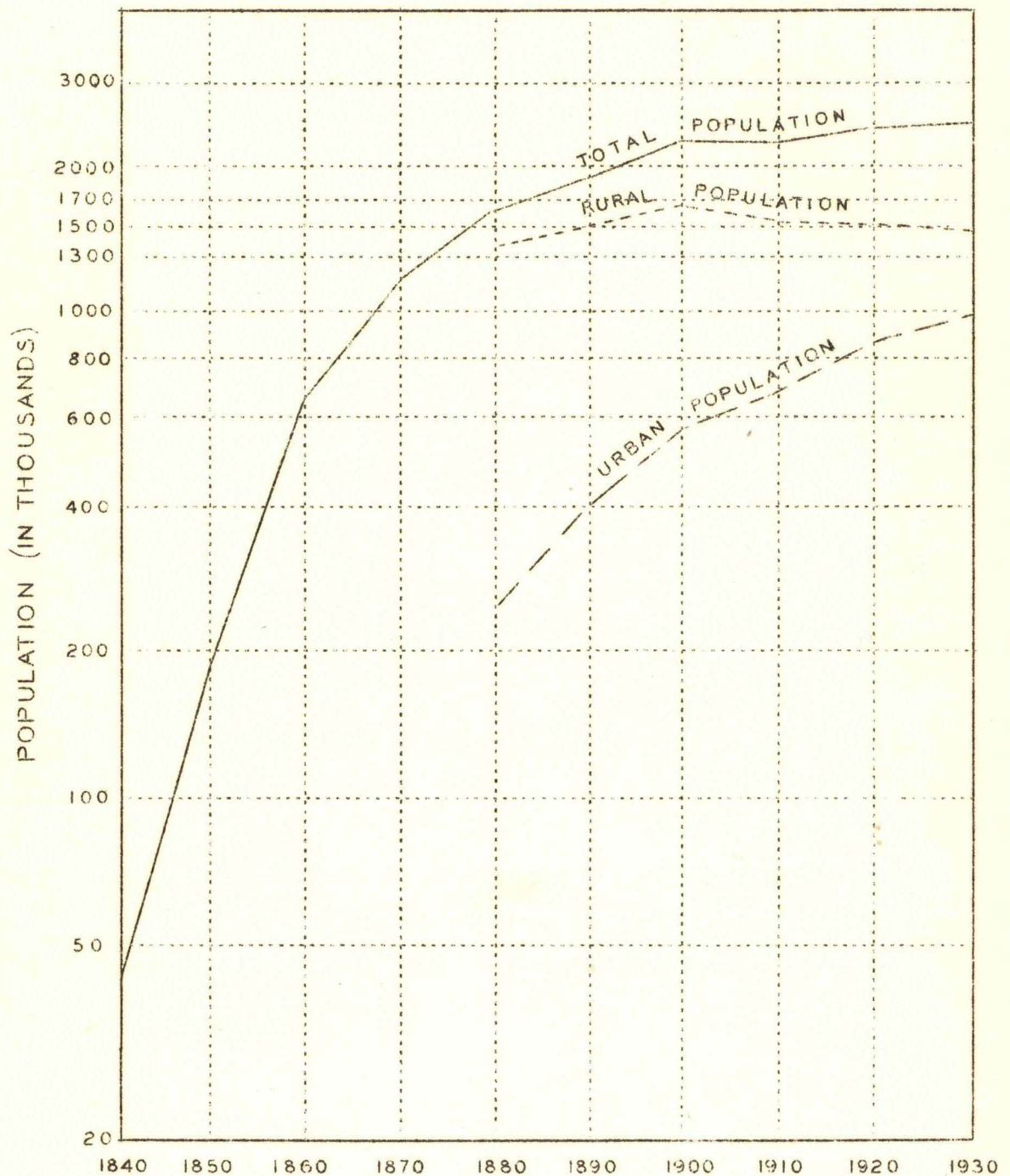
* * * *
* * *
* *
*

A Report by
Bernard D. Karpinos
for the
IOWA STATE PLANNING BOARD
Committee on Population and Social Trends
March, 1935

Gift, State University 7/21/75 cap. 1-

GROWTH OF IOWA POPULATION

TOTAL, RURAL, AND URBAN
1840 - 1930



IOWA STATE PLANNING BOARD

FIG. 1

W. P. A.
PROJECT
2 9 2 9

TABLE OF CONTENTS

	Page
INTRODUCTION.....	1
GENERAL GROWTH OF IOWA POPULATION.....	6
MIGRATION AND POPULATION GROWTH.....	15
Immigration from Other States.....	15
Emigration from Iowa.....	20
Foreign-born in Iowa.....	22
Nativity of Population.....	22
AGE COMPOSITION OF IOWA POPULATION.....	28
MARITAL CONDITION OF IOWA POPULATION.....	35
RECENT MIGRATION OF IOWA POPULATION.....	42
Gains and Losses by Counties.....	42
Gains and Losses in Urban and Rural Populations.....	42
Gains and Losses by Age Groups.....	48
PAST AND PRESENT BIRTHS, BIRTH RATES, AND FERTILITY RATES.....	55
General Trend.....	55
Specific Fertility Rates.....	57
Birth Rate of Zero Rate of Natural Increase.....	61
Past Fertility Rates.....	64
Reproduction Rates of the Rural and Urban Populations.....	68
Number of Children in Order of Birth.....	70
DEATHS, DEATH RATES, INFANT MORTALITY RATES, AND EXPECTATION OF LIFE.....	75
TRUE RATES OF NATURAL INCREASES, COMPUTED STABLE POPULATION, STABLE BIRTH AND DEATH RATES.....	83
FUTURE GROWTH.....	91
When Will the Stabilization Point be Reached.....	91
The Immediate Growth of the Iowa Population.....	98
FUTURE BIRTHS AND BIRTH RATES, DEATHS AND DEATH RATES.....	101
CHANGES IN THE FUTURE AGE COMPOSITION OF IOWA POPULATION.....	105

LIST OF CHARTS

Number		Page
1	Growth of Iowa Populations, Total, Rural, and Urban, 1840-1930.....	Front
2	Rate of Change of Iowa Population, 1890-1930.....	5
3	Per Cent Increase of Iowa Total Population Since 1840.....	7
4	Distribution of Urban Population, 1930.....	9
5	Migration of Population To and From Iowa, 1870-1930.....	14
6	Mobility of Iowa Population.....	16
7	Foreign-born White Population of Iowa, 1870-1930.....	25
8	Percentages of Iowa Population Born in Iowa, Born in Other States, and Born Abroad, 1870-1930.....	26
9	Composition of Population: Age of Farm, Rural Non-Farm, and Urban Classes, 1930.....	27
10	Per Cent Distribution of Iowa Male and Female Population by Broad Age Periods, 1880-1930.....	29
11	Per Cent of Population Married by Age Groups, by Sex, and by Rural Farm, Rural Non-Farm, and Urban Divisions, 1930	34
12	Percentage of Iowa Population 15 Years of Age and Over Married, by Age and Sex, 1890-1930.....	37
13	Population Growth, 1920-1930.....	41
14	Per Cent of Gains and Losses of Iowa Population Through Migration for Different Age Groups, 1920-1930.....	52
15	Trend in the Number of Children Under 5 Years of Age, Births, Birth Rates, and Gross Reproduction Rates, 1880-1930; 1880 Taken as a Base.....	54
16	Gross Reproduction Rates of Iowa Total Population (1880- 1930), of Rural Farm, Rural Non-Farm, and Urban Population, 1920-1930.....	67
17	Birth Changes in Iowa with the Number of Child in Order of Birth, 1924-1930.....	72

LIST OF CHARTS (CONTINUED)

Number		Page
18	Births and Deaths in Iowa, 1923-1932.....	74
19	Iowa Population, Total and Broad Age Periods, 1900-2025..	90
20	Per Cent Distribution of Iowa Population, Stable, and Years 1930, 1975, 2000.....	96
21	Iowa Population for 1930-2025 Compared with 1930 as Base.	99
22	Estimated Births and Deaths of Iowa Population, 1930-2020	100
23	Estimated Birth and Death Rates of Iowa Population, 1930-2025.....	103
24	Per Cent Distribution of Iowa Population, Five-Year Age Periods, 1880, 1930, and Stable Population.....	104

LIST OF TABLES

Number		Page
1	The Growth of Iowa Total Population Since 1840.....	8
2	Rural: Farm and Non-Farm, and Urban Population in Iowa Since 1880.....	10
3	Rural Farm and Rural Non-Farm Population, 1920-1930.....	12
4	Number of Cities and Incorporated Places, and Their Populations, 1890-1930.....	13
5	Native Born of Other States Living in Iowa, Native Born of Iowa Living in Other States, and Their Successive Increases, 1870-1930.....	17
6	Iowa Immigration and Emigration.....	19
7	Percentage of White Population Born in Iowa Living in Other States in the United States.....	20
8	Foreign-born Whites in Iowa, 1870-1930.....	23
9	Percentage of Iowa Population Born in Iowa, Born in Other States, and Born Abroad, 1870-1930.....	24
10	Per Cent Distribution by Broad Age Periods Since 1900, Iowa and the United States.....	30
11	Per Cent Distribution by Broad Age Periods of Iowa Urban, Rural Farm, and Rural Non-Farm Population.....	32
12	Iowa Population by Broad Age Periods, 1880-1930, Compared with 1880.....	33
13	Marital Conditions of the Population of Iowa, 1890-1930..	36
14A	Per Cent Distribution by Marital Condition of the Urban, Rural Farm, and Rural Non-Farm Population 15 Years Old and Over, by Sex, Iowa, 1930 (Males).....	39
14B	Per Cent Distribution by Marital Condition of the Urban, Rural Farm, and Rural Non-Farm Population 15 Years Old and Over, by Sex, Iowa, 1930 (Females).....	40
15	Expected and Actual Population of Iowa; Its Gains and Losses Through Migration, 1920-1930, by Counties.....	43

LIST OF TABLES (CONTINUED)

Number		Page
16	Actual Increase, Expected Natural Increase, and the Gains and Losses of Cities in Iowa Having 10,000 and More Population, 1920-1930.....	49
17	Per Cent Gains and Losses in Iowa Population Through Migration, by Age Groups and Sex: Total, Urban, Rural Farm, and Rural Non-Farm Population, 1920-1930.....	50
18	Number of Children of Under One and Under Five, and Estimated Births and Birth Rates of White Population, 1880-1930.....	56
19	Quinquennial Fertility Rates of Iowa Population, 1929....	59
20	Computation of the True Rate of Natural Increase of Iowa Population, 1929.....	62
21	Computation of Birth Rates in Iowa Giving Zero Rate of Natural Increase with Age Distribution as in 1930 Census.....	65
22	Estimated Birth Rates of White Population in 1880-1930; Computed Birth Rates of the Same Populations on the Basis of 1929 Specific Fertilities; Their Gross Reproduction Rates.....	66
23	Estimated Birth Rates of Total, Urban, Rural Farm, Rural Non-Farm Populations; Computed Birth Rates of the Same Groups on the Basis of 1929 Specific Fertilities; Their Gross Reproduction Rates, 1920-1930.....	69
24	Births With Number of Child in Order of Birth, Comparative Percentages, 1924 Base.....	71
25	Births (Exclusive of Stillbirths) by Age of Mother, Years 1924-1930, Compared with 1924 as Base.....	73
26	Deaths and Crude Death Rates in Iowa and the United States, since 1923.....	75
27	Infant Mortality of White Population in Iowa and the United States.....	77
28A	Complete Life Tables: for White Males.....	78
28B	Complete Life Tables: for White Females.....	80

LIST OF TABLES (CONTINUED)

Number		Page
29	Reproduction Rates and True Rates of Natural Increases of Iowa Population, 1929.....	84
30	Computation of Stable Population of Iowa.....	86
31	Age Distribution of Iowa Stable Population: Male, Female and Total.....	88
32	Computation of Births in Iowa for Stable Population.....	89
33	Computation of Iowa Population for 1935.....	92
34	Iowa Total Population by Broad Age Periods, 1930-2025.....	93
35	Iowa Population for 1930-2025 (Total and of Different Age-Groups) Compared with 1930 as Base.....	95
36	Per Cent Distribution of Iowa Population (Years: 1930, 1950, 1975, 2000) as Compared with the Distribution of Stable Population.....	97
37	Births and Deaths, Birth and Death Rates of Iowa Population, 1935-2025.....	102
38	Percentages of Iowa Total Population by Broad Age Periods, 1930-2025.....	106

FOREWORD

by

Prof. C. W. Hart
Technical Adviser
Committee on Population and Social Trends

Forecasting the future growth of a population is by no means an unusual undertaking. Every action, whether public or private, that has reference to the future of the community--construction of a school building, laying out of a new subdivision, in fact, any long-time investment of funds in public, semi-public or private works,--implies an estimate, consciously or unconsciously made, concerning the future size and character of the population.

Often the estimate of the future that is taken as a basis of present policies and programs is merely an expression of the common wish for bigness and of an easy optimism developed by the rapid industrial and commercial expansion of the last century. Sometimes the estimate rests upon an unwarranted projection into the future of apparent historical trends and a superficial reading of present indices. Because the community has experienced more or less continuous growth in numbers in the past and because at present the number of individuals born each year exceeds, perhaps by a substantial figure, the number of individuals who die, the assumption of continued growth in the future is made.

But informed action requires a more careful scrutiny of the facts. The crude statistics of births and deaths, gains and losses in numbers, age, marital status, urban-rural distribution, etc., must be analyzed to find out their more precise indications concerning future growth in numbers and future changes in the composition and distribution of the population.

The present study presents the conclusions at which Dr. Karpinos and his associates arrived after months of careful study of the population of the State of Iowa. Its importance as a basic study in the field of State Planning will be apparent to anyone who will read it carefully.

It may be surprising to some to find that present indices, properly understood, point to a stationary population in Iowa forty-five or fifty years hence and to a stationary population of approximately 3,000,000 as compared with the present population of 2,500,000. This probability may be especially surprising to those familiar with the published fact that the yearly excess of live births over deaths is now 6.7 for each one thousand individuals in the population; this rate of natural increase should, it would seem, yield a population fifty years hence much larger than 3,000,000. But Dr. Karpinos has shown how deceptive this crude rate of natural increase is unless one takes into account the age-composition of the population. In

other words, the number of women of child-bearing age will probably be a smaller and smaller proportion of the total population during the next fifty years, and this change in age-composition will be reflected in a declining rate of growth.

But although the probability may be surprising, its bearing upon planning, whether public or private, should be apparent. It should be taken into account in the construction of city plans, in planning programs of institutional development--educational and recreational facilities, for example, in calculations of future industrial and commercial developments, and so on. Incidentally, to the extent that it is taken into account in planning for the future, the emphasis may be shifted from size--mere bigness--as a criterion of value to more worthy conceptions of community development.

It may also be surprising to the reader to find what marked changes in age-composition present tendencies, if they continue to operate, will effect in the future. Two important differences in the age-composition of the Iowa population of 1980 are forecast by the analysis Dr. Karpinos has made. First, young people under twenty will not only be a smaller proportion of the total population but will also be actually fewer in number than in 1930. For every one hundred people under twenty in Iowa in 1930, there will be only ninety-six in 1980. And whereas this group comprised about 37 per cent of the total population in 1930, it will include less than 30 per cent of the total in 1980. Second, this decline in the youth group will be accompanied by a substantial increase in the older age groups. People from forty to fifty-nine years of age will be approximately half again as numerous as in 1930; those from sixty to seventy-nine will be twice as numerous; and those eighty and above will be three times as numerous. Together these older age groups will comprise approximately 44 per cent of the total population as compared with 32.4 per cent in 1930.

Obviously the financial burden of caring for the aged is going to increase markedly and is going to fall upon relatively fewer purses among the younger members of the society. One might anticipate increasing demand for old-age pensions and institutional care of the aged, together with an increasing strain upon business and industry, which must directly or indirectly shoulder this load. Perhaps even more significant may be the difference in interest, outlook on life, forms of community activity, and the like that will follow from this change. The state, which in the past has been essentially a society of young people, may show the effect of increasing influence of older people.

The study reveals many other facts of importance concerning the factors affecting the growth of the Iowa population. As in the study of migration, it was often found difficult to determine the probable future effects of some of these factors, largely because of the incompleteness or unreliability of available information. Other studies of the Committee will, when completed, supplement the present findings at many points.

The forecasts developed in this study should not be looked upon as

predictions. They will be borne out if, and to the extent that, the assumptions carefully set forth by Dr. Karpinos prove to have been warranted. New developments may occur to change the picture drawn here; but what those developments will be no one can foresee. These assumptions, which should be kept clearly in mind by the reader, may well be reviewed here.

1. It is assumed, for purposes of this forecast, that there will occur no further decline in specific birth-rates--that is, in the number of children born per thousand women of child-bearing age. This assumption is, at least, conservative, as birth-rates have declined sharply in the past and are still declining. But the history of birth-rates in older populations than ours warrants the assumption, supportable also on other grounds, that the rates in Iowa will likely become constant at about the present figure.
2. It is assumed that no increase or decrease in specific death-rates will occur. This assumption is not wholly warranted. The death-rates have fallen sharply in the recent past, due largely to the decrease in infant mortality. Many students expect further substantial gains in the prolongation of life. To the extent that death-rates fall and other factors affecting the size of the population remain constant, the future population will exceed the estimate given.
3. It is assumed that there will be no increase or decrease in the net-annual loss of numbers resulting from migration. This assumption may not be warranted, either, as studies of migration show that increasing numbers have been leaving the state in recent years, most of them caught in the city-ward movement, whereas migration into the state has materially decreased. If the national government continues its policy of restricted immigration from other countries, Iowa, with no undeveloped land to be brought under cultivation, with little water or other power resources to be developed, and with slight prospect for extended industrial expansion, is likely to lose population to other areas rather than to draw people from them. The findings of this study, when brought together with the findings of other published studies, indicate that during the next fifty years Iowa may reasonably expect to lose at least 50 per cent of her natural increase by movement out of the state. This loss, which will come again from young people in the productive years of life, will, in all likelihood, more than offset any gain resulting from a reduction of the death rates.

INTRODUCTION

Growth of a population--its increase or decrease and its potency to maintain itself--depends on many factors: on the number of births in itself (apart from the excess of births over deaths); on the age-composition of the population (whether there is a preponderance of persons in the most productive age groups, or whether there is a preponderance in the older age periods); on its marital condition; on immigration and emigration. An analysis of the growth of a population requires, therefore, a complete evaluation of all these factors; none of them considered separately reflects the real state of affairs.

Some students of population problems and most laymen are misled by apparent, but unreliable, signs of an increase in population. If the census of one decade shows an increase in the population during the decade, or if there is known to be an excess of births over deaths, they feel pleased and easy. But such conditions are not necessarily indicative of an adequate rate of reproduction. England of 1927, to borrow an example from Kuczynski,¹ with its 170,000 excess of births over deaths was sure

1. Robert R. Kuczynski, The Balance of Births and Deaths, Macmillan Company, New York, 1928, Vol. 1, p. 2.

ultimately to have a declining population. Its 655,000 births in the year 1927 indicated that on the average each woman during her life-time gave birth to but two children, the minimum number of births that would secure full reproduction of a population even if none of the children died before passing through parenthood--and, of course, many of them will die before reaching the child-bearing age. It is clear that such a population, in spite of the immediate excess of births over deaths, is eventually doomed to decline, no matter how low the mortality be reduced, and it cannot be reduced indefinitely.

Birth-rates and death-rates are functions not only of fertility and mortality, but also of the age-composition of the population.² A

2. These will be designated hereafter as the "crude" rates. The rate of natural increase as expressed by these rates will be called the "crude" rate of natural increase.

population having an unusually large proportion of its members in the middle age-groups, wherein fertility rates are high and mortality rates low, will have a deceptively large number of births and a high birth-rate, and, correspondingly, a deceptively small number of deaths and a low death-rate, though the fertility in itself of the female population may not be sufficient for the population to reproduce its numbers. The

fertility-deficiency, if there is such, is obscured by the excess of numbers in the more potent reproductive ages. The converse is true: if people beyond the child-bearing period are more numerous in a population, fewer births and more deaths will occur, and as a result the birth-rate will be low and the death-rate high--though the population's fertility per se might be high and its mortality low.

It was shown by Dublin and Lotka³ in their study of the population of

-
3. Louis I. Dublin and Alfred J. Lotka, "On the True Rate of Natural Increase," Journal of American Statistical Association, XX (1925), pp. 305-339.
-

the United States that when due allowances were made for age-distribution, the corrected birth-rate of the white population of the United States for 1920 was 20.9 instead of 23.4 and the death-rate 15.4 instead of 12.4 as recorded in the Birth and Death Statistics. The birth- and death-rates that prevailed at that time gave a crude natural increase of 11 per thousand per annum (23.4 - 12.4) while the corrected rates showed an increase of 5.5 per thousand per annum (20.9 - 15.4)--a rate only half as large as the crude rate. In a later study, the same authors⁴ found that

-
4. Louis I. Dublin and Alfred J. Lotka, "The True Rate of Natural Increase of the Population of the United States," Metron, VIII (1930), pp. 107-119.
-

the corrected birth-rate for the white population of the United States for the year 1928 was 17.3 and the death-rate 15.6, as against the reported figures of 19.4 and 11.6 respectively. The true increase was calculated as 1.7 per thousand (17.3 - 15.6), giving thus an ultimate rate of increase of about one-fifth of the crude rate. The decline in the corrected rates between 1920 and 1928 was evidently due to the decline in the fertility of women.

But ultimately such distortions in age distribution must disappear and the crude birth- and death-rates correspondingly adjust themselves. F. R. Sharpe and Alfred J. Lotka again proved that a population, if constantly subject to fixed rates of fertility and to fixed rates of mortality and if subject to no immigration or emigration, will eventually achieve a fixed or stable age-composition which will make the rate of natural increase constant⁵. This constant rate is the so-called stabilized rate

-
5. F. R. Sharpe and Alfred J. Lotka, "A Problem of Age-Distribution," London, Edinburgh and Dublin Philosophical Magazine and Journal of Science, 21, Sixth Series, (January-June, 1911), pp. 435-438. See also: Alfred J. Lotka, Elements of Physical Biology, Williams and Wilkins Company, 1925, pp. 110-118.
-

of increase, the "true" rate.

As such abnormalities⁶ of age-distribution are disappearing, the crude

-
6. This concept refers to the differences between the existing age-distribution of the population and the "stable" one. "Abnormal" and "abnormalities" are consequently relative terms. The terms "irregular" and "irregularities" are also used in the same sense. See: Bernard D. Karpinos, "The Implications of Certain Population Concepts," Social Forces, December, 1935.
-

birth- and death-rates approach the corrected, or true, rates. If the population is abnormally young, the birth-rate will decline and the death-rate will rise; if the population is old, the birth-rate will rise and the death-rate will fall.

Obviously, birth and birth-rates, and deaths and death-rates, taken as they are without due attention to the age-distribution of the population supply a misleading index for gauging the future growth of a population; other indexes should be introduced.⁷

-
7. For a more detailed analysis see: Bernard D. Karpinos, op. cit., Social Forces.
-

Iowa has a comparatively young population. Heavy immigration that brought many young people; the prevalence of large families in the past generation; and the recent rapid decline in birth-rates are responsible for a high proportionality in the reproductive age-groups of the Iowa population. This high proportionality has been producing relatively high birth-rates and low death-rates, covering up the inherent trend. Iowa reported, in 1930, a crude birth-rate of 17.3 and a crude death-rate of 10.6, giving a crude rate of natural increase of 6.7 per thousand per annum. At such a rate the Iowa population should increase by about 20 per cent per generation.⁸ Is Iowa going to increase at such a rate in

-
8. A generation equals approximately 30 years, see infra.
-

the future, or is this rate due purely to the irregularities of its age-distribution which will eventually disappear?

The major problem undertaken in this study is to establish, for the Iowa population, indexes of fertility per se, which will eliminate the effects of abnormal age distribution, and to determine on the basis of these fertility-indexes the ultimate true rate of growth and the future numbers of the population. Incidentally it was necessary to determine what changes will likely occur in the age-distribution of the population;

how these shifts will affect the future number of births and deaths; when the process of stabilization will be complete; and how migration and changes in marriage rates, as far as these can be forecast from present trends, are likely to affect the population of the future.

First, a general historical view of the past trends in the population with respect to its growth, migrations, age-composition, and marital conditions is given, with particular attention to the most recent Iowa emigration, pointing out the counties, the age-groups, and the classes from which the emigrants come--as such an analysis provides fundamental data for judging the character and economic status of Iowa's so-called "excess" population. Second, detailed analyses are made of the past and present trends of births, birth-rates and fertility-rates of the population. Finally, on the basis of these analyses, the future size and structure of the population is forecast.

The study is based mainly on data published or specially provided by the Bureau of the Census.

1890-1930



GENERAL GROWTH OF IOWA POPULATION

As enumerated in the Fifteenth Census, the Iowa population numbered about two and one-half million persons in 1930. This was nearly 573 times its total number at the time of the first enumeration in 1840, and only 1.3 times the number enumerated in 1890, half a century after the first enumeration. The rapid growth of the Iowa population in its earlier days was mainly attributable to immigration. Since the beginning of the present century the population has grown chiefly by natural increase.

As may be seen from Table I (column 4) and Figure 3, the rate of growth has been rapidly declining. It dropped from about 346 per cent during the 1840-1850 decade to 2.8 in the last decade. In fact, during the ten years between 1900 and 1910, there was an actual decrease in numbers. Since the nineties of the past century, the rate of growth of the Iowa population has been much lower than that of the United States as a whole, because of heavy emigration to other states (compare columns 4 and 5, Table I).

Almost all of the eastern counties of the state have had no significant increases in population since the beginning of the century. The few eastern counties that increased in population were those with growing urban centers (compare Figures 2 and 4). The southern counties had already begun to show a decrease at that time. During the first two decades of the century the only growing section was the northwestern part of the state.

The rural population⁹, which includes all people who live in places

⁹. The Federal Census definitions were adopted for the terms rural, rural farm, rural non-farm, and urban.

with fewer than 2,500 inhabitants, has been steadily decreasing since the beginning of the century. It declined about 7 per cent from 1900 to 1910, and 1.0 per cent and 2.4 per cent respectively during the two succeeding decades (Table II).

During the last decade the farm group of the rural population¹⁰ showed

¹⁰. No analysis is made for this group for previous years, for a division of the rural farm population into rural farm and rural non-farm groups was not made by the Census prior to 1920.

a noticeable decline. This group, which includes all people who live on farms, regardless of their occupations, decreased during the last ten-year period by more than 1 per cent. It counted in 1930 about 965,000 persons

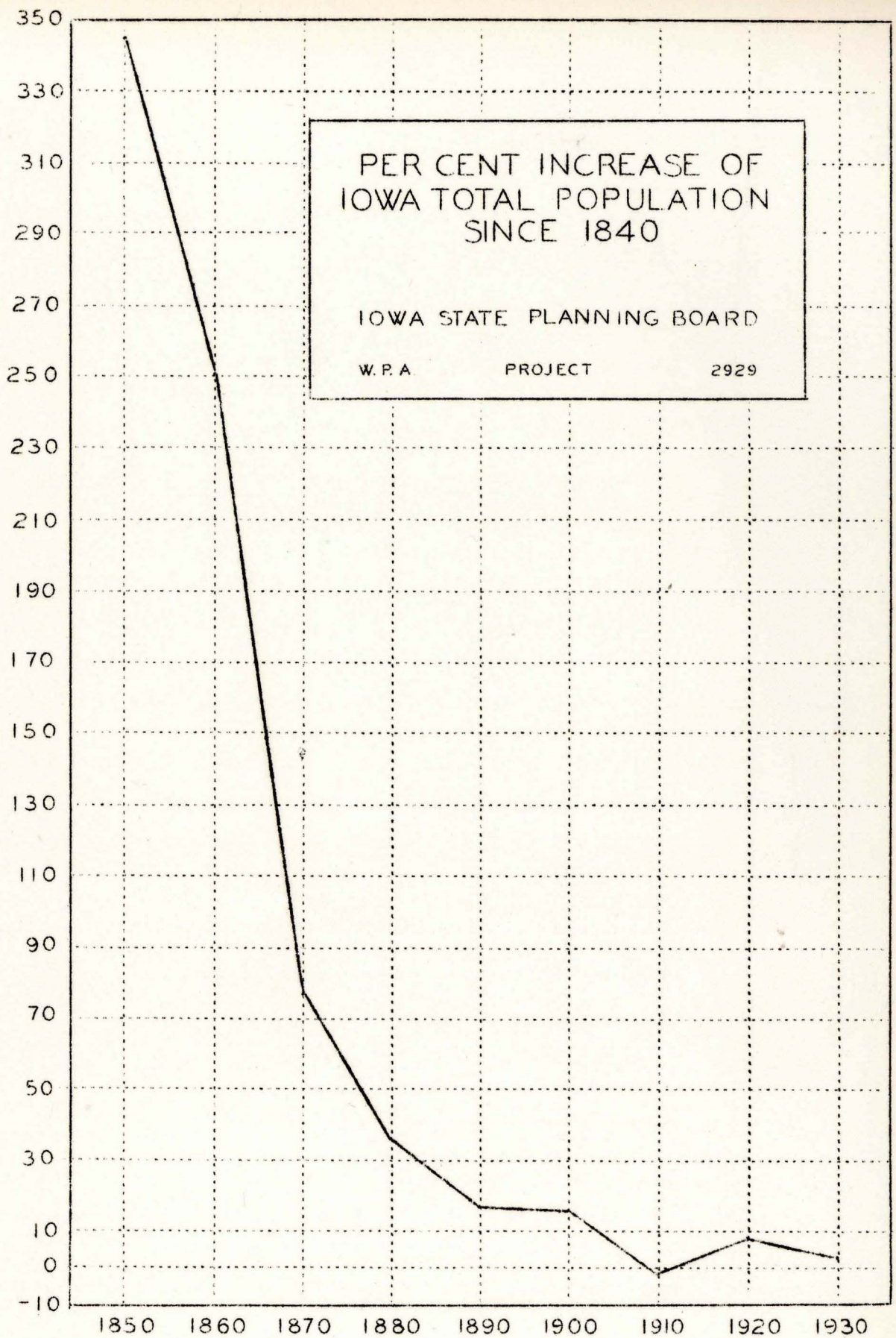


TABLE I

THE GROWTH OF IOWA TOTAL POPULATION SINCE 1840*

Year		Iowa		United States
1	2	3	4	5
Census	Population	Increase in Number	Per Cent Increase	Per Cent Increase
1840	43,112			32.7
1850	132,214	149,102	345.8	35.9
1860	674,913	482,699	251.1	35.6
1870	1,194,020	519,107	76.9	22.6
1880	1,624,615	430,595	36.1	30.1
1890	1,912,297	287,682	17.7	25.5
1900	2,231,853	319,556	16.7	20.7
1910	2,224,771	-7,082	-0.3	21.0
1920	2,404,021	179,250	8.1	14.9
1930	2,470,939	66,918	2.8	16.1

* Adopted from the 15th Census of the United States, Vol. 1; Population Number and Distribution of Inhabitants, p. 359.

IOWA STATE PLAN • DISTRIBUTION OF URBAN POPULATION •

1930

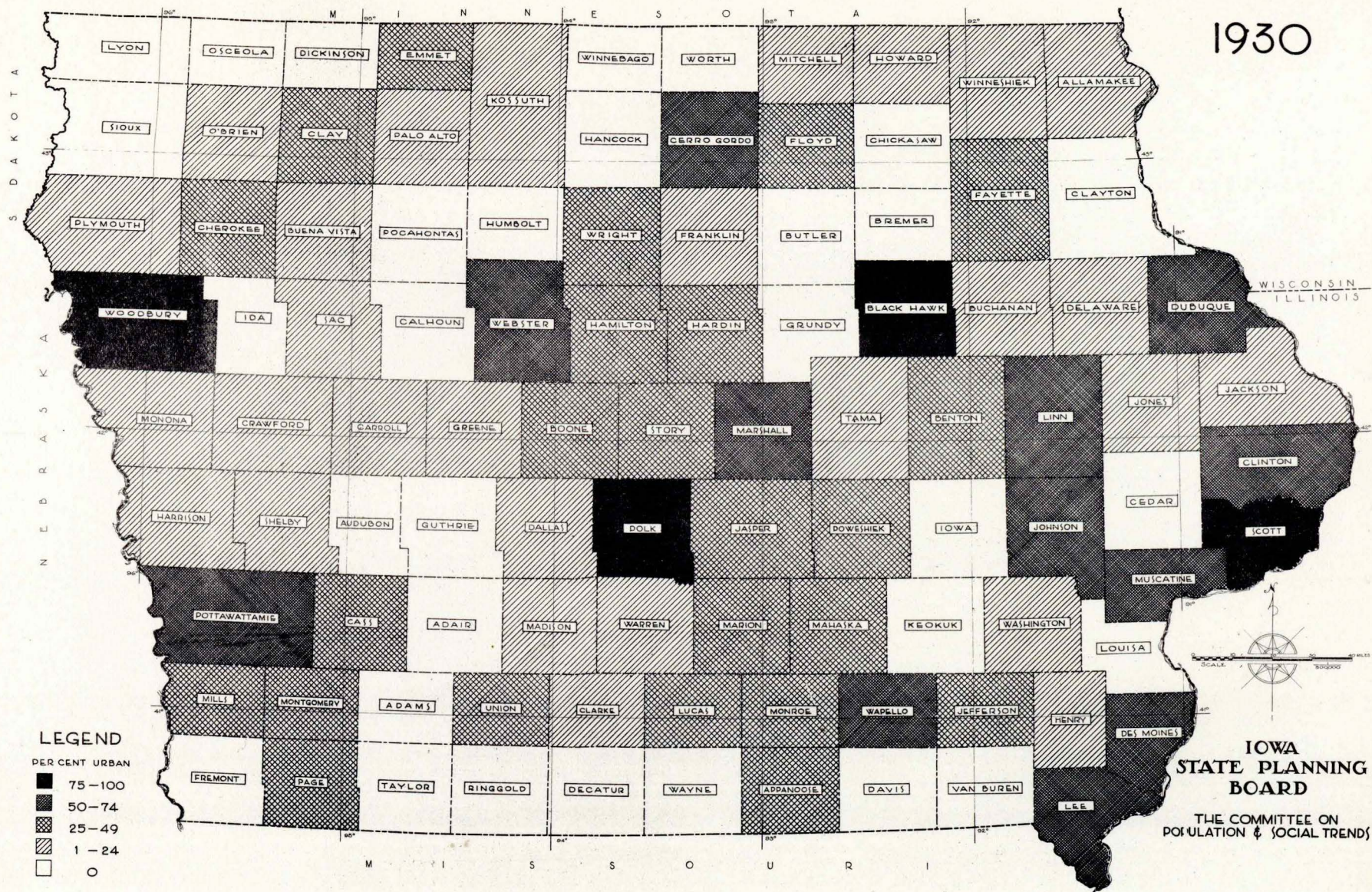


FIG. 4

TABLE II

RURAL, FARM AND NON-FARM, AND URBAN
POPULATION IN IOWA SINCE 1880*

Years	Number			Per Cent of Increase over Preceding Census			Per Cent of Total Population	
	Total	Rural	Urban	Total	Rural	Urban	Rural	Urban
1	2	3	4	5	6	7	8	9
1880	1,624,615	1,377,188	247,427				84.8	15.2
1890	1,912,297	1,506,533	405,764	17.7	9.4	64.0	78.8	21.2
1900	2,231,853	1,659,467	572,386	16.7	10.2	41.1	74.4	25.6
1910	2,224,771	1,544,717	580,054	- 0.3	- 6.9	18.8	69.4	30.6
1920	2,404,021	1,528,526	875,495	8.1	- 1.0	28.7	63.6	36.4
1930	2,470,939	1,491,647	979,292	2.8	- 2.4	11.9	60.4	39.6

* Taken from: Farm Population of the U.S., Census Monographs VI, Washington, D.C., 1926, p. 180; 15th Census of the United States, Population Bulletin, 2nd Series, Iowa, p. 3. Rural includes all the farm population and the population in towns of less than 2,500 population; urban includes all cities and towns of 2,500 persons and over.

as compared with 978,000 persons in 1920. The greatest decline occurred in the rural non-farm group which constitutes the remainder of the rural population; it showed a decrease of more than 4 per cent during the last decade.¹¹ Its numbers decreased from nearly 551,000 in 1920 to 527,000 in

-
11. The difference in the definition of the term "farm" in 1920 and 1930 (the 1920 Census definition would give a higher number of farm population in 1930, and consequently a smaller decrease) is probably offset by the fact that the 1930 Census was taken in April, (the date of the 1920 Census was January) when the number of laborers on the farms is appreciably larger; it seems thus that the calculated 1 per cent decrease in the farm population between 1920 and 1930 may be considered as the right index (see: 15th Census of United States, 2nd series, Iowa Bulletin, p. 1).
-

1930 (Table III).

The urban population, residing in cities and incorporated places of 2,500 or more inhabitants, has been increasing. In 1890, Iowa had forty-six cities and towns, each counting 2,500 persons or more, with a total population of about 406,000 persons; in 1930 the number of urban places reached eighty-one, with a combined population of about 979,000 persons. In 1890, the urban population comprised slightly more than 20 per cent of the total population; by 1930 it comprised about 40 per cent, almost doubling its per cent with respect to the population as a whole (Tables II and IV). The increase, however, took place in the larger cities. Places with populations between 5,000 and 25,000 showed a large decrease (Table IV, column 11). Since 1900 the smaller cities have not increased in number nor in aggregate population.¹²

-
12. One should be aware of the fact that an addition of only one person to a population of 2,499 makes that population urban; evidently, great caution should be exercised in making any deduction as to the "urbanization" of the state.
-

Iowa did not have a city above 10,000 before 1860. Since 1890, the city population has grown rapidly. From 1900 to 1920 it increased at a rate of 25 per cent per decade. During the 10 years from 1920 to 1930 it increased about 14 per cent--a rate of growth five times as high as that of the state as a whole (Table IV, Appendix). By 1930, the population of Iowa living in cities of 10,000 and above made up about 29 per cent of the total population.

TABLE III

RURAL FARM AND RURAL NON-FARM POPULATION, 1920-1930

Years	Number	Per Cent Increase	Per Cent of Total Population
1	2	3	4
Rural Farm			
1920	977,694		40.7
1930	964,659	-1.3	39.0
Rural non-farm			
1920	550,832		22.9
1930	526,988	-4.3	21.4

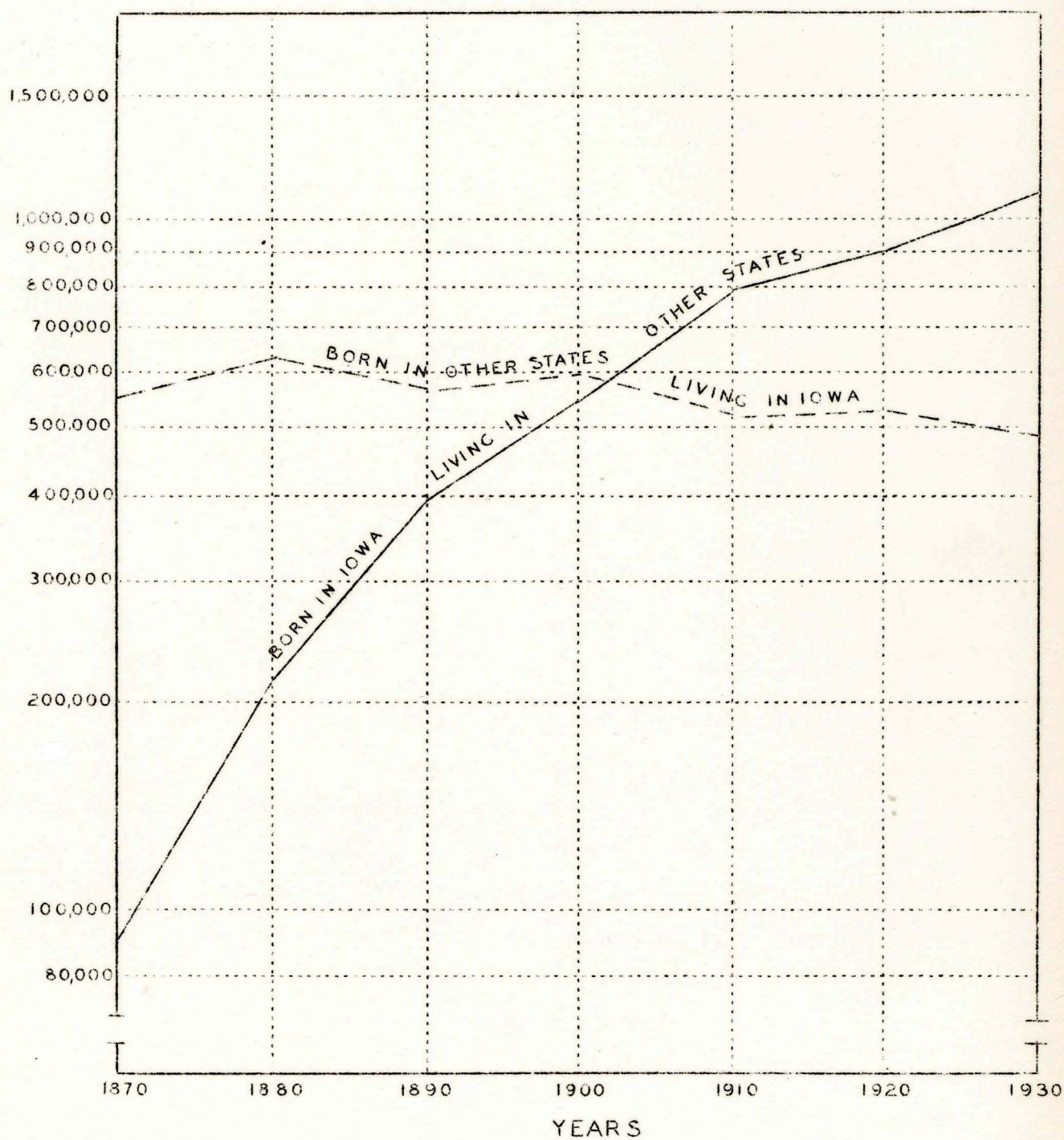
TABLE IV

NUMBER OF CITIES AND INCORPORATED PLACES,
AND THEIR POPULATIONS, 1890-1930*

	1890		1900		1910		1920		1930		Increase 1920-1930 Per Cent
	No.	Pop.	No.	Pop.	No.	Pop.	No.	Pop.	No.	Pop.	
	1	2	3	4	5	6	7	8	9	10	11
<u>Cities:</u>											
100,000 or more	---	---	---	---	---	---	1	126,468	1	142,559	12.7
25,000 - 100,000	4	145,082	6	218,259	8	330,091	6	285,053	9	406,505	42.6
10,000 - 25,000	7	115,234	8	129,096	9	137,107	11	192,629	11	167,405	-13.1
5,000 - 10,000	8	56,582	10	70,618	9	59,402	18	114,802	14	94,173	-18.0
2,500 - 5,000	27	88,866	46	154,413	43	153,454	45	156,543	46	168,650	7.7
<u>Rural incorporated places:</u>											
1,000 - 2,500	89	135,307	116	172,917	114	172,460	129	192,707	123	186,409	- 3.3
Under 1,000	327	161,191	498	227,875	654	266,255	703	285,094	713	278,513	- 2.3
<u>Farm and unincorporated hamlets</u>		1,210,035		1,258,675		1,106,002		1,050,725		1,026,725	- 2.3

* Taken from the 15th Census of the United States, Second Series, p. 1, Iowa Bulletin

MIGRATION OF POPULATION TO AND FROM IOWA 1870 - 1930



IOWA STATE PLANNING BOARD

MIGRATION AND POPULATION GROWTH

Immigration from Other States

Viewed historically, three periods are roughly marked out in the influx of native white migrants from other states into Iowa. In the early sixties, seventies and eighties, the far as well as the near eastern states served as the chief source of Iowa immigration. Ohio, New York, Pennsylvania, Illinois, Indiana, Virginia, and Kentucky contributed heavily to Iowa's settlement. From the eighties to the beginning of our own century, Iowa's immigrants came largely from the adjacent states, Illinois, Wisconsin, Missouri, and Minnesota, named in order with respect to the number of immigrants. The latest flow of immigrants has been from the neighboring western states as a whole, but considered individually, Missouri has contributed the largest number of immigrants, followed in order by Minnesota, Nebraska, South Dakota, Kansas, and Colorado.

Adequate statistical data portraying the magnitude and rapidity of these immigrations are not available. Their general trend, however, is indicated by the Census reports as to State of Birth.¹³ These census data

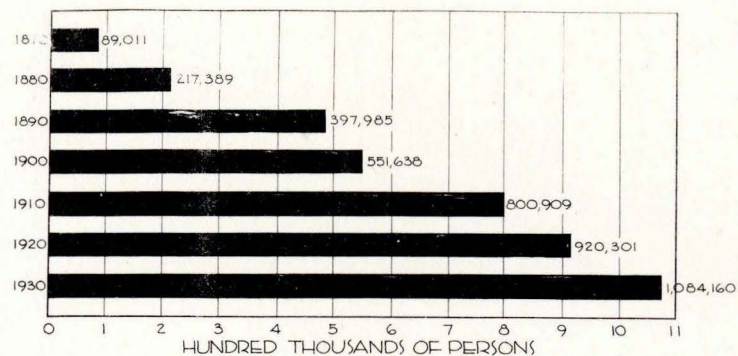
13. 15th Census of the United States, State of Birth of the Native Population, Volume II, Washington, 1932.

for Iowa are given by states in Table V (Appendix), and summarized in Table V (see also Figure 3, Appendix). The actual movement of population to and from Iowa is not fully represented by these figures. They indicate merely the number of persons from other states living in Iowa at particular census years; "They show not the extent of interstate migration (that is, the number of persons who go from one state to another) but the net, cumulative results of such migration in combination with mortality."¹⁴

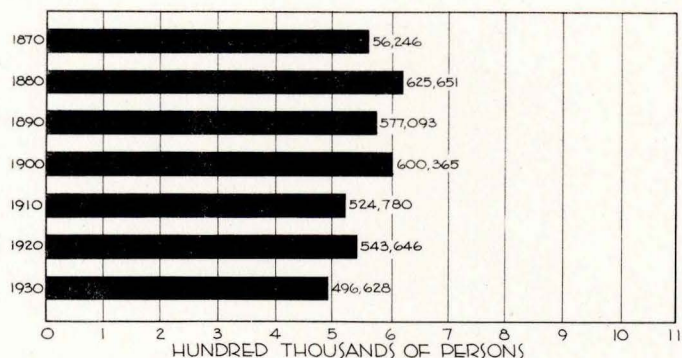
14. "Interstate Migrations", United States Department of Agriculture: Interpreting the Data, p. 3, Washington, 1934.

According to these figures, there lived in Iowa in 1870, 560,000 persons who were born in other states. The number increased to about 626,000 in 1880, reaching its peak in that year. From then on, the number of natives from other states has been gradually declining (See Figure 6: Mobility of Iowa Population). In 1930, Iowa counted about 500,000 native-born persons in other states.

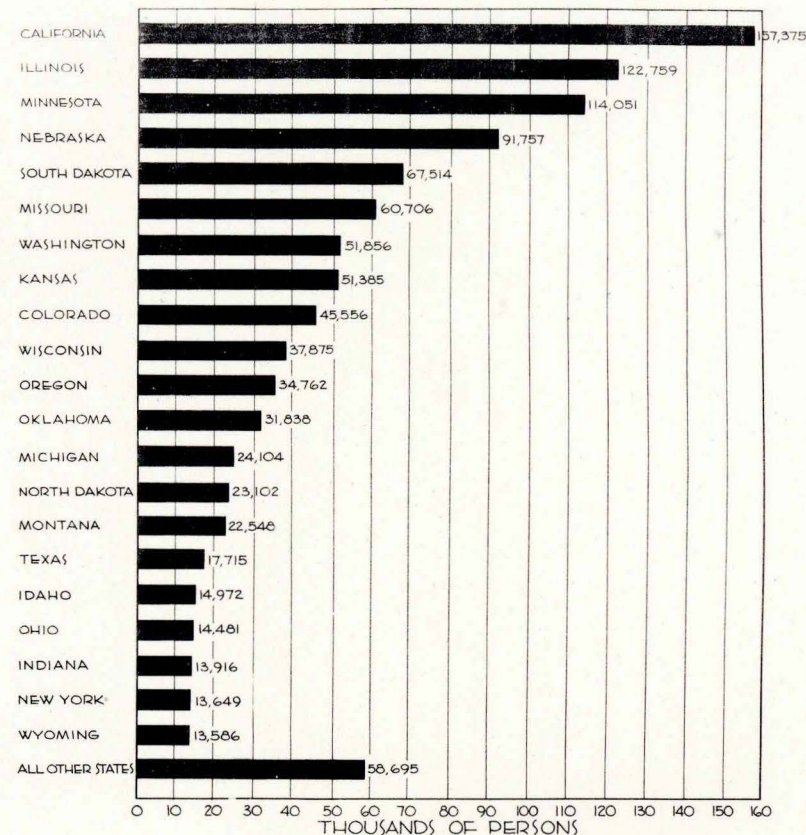
This decline, however, does not mean that no immigration has been taking place since 1880. It indicates that, since that year, the successive net immigrations have either been negative or, if positive, have not been large enough to offset the losses by death of natives of other states living in Iowa. While the number of those born in other states and living



NATIVE BORN OF IOWA
LIVING IN OTHER STATES



PERSONS BORN IN OTHER
STATES & LIVING IN IOWA



NATIVE BORN IOWANS
LIVING IN OTHER STATES
1930

DATA FROM FEDERAL
CENSUS 1870-1930

IOWA STATE PLANNING BOARD MOBILITY OF IOWA POPULATION

PREPARED BY
THE COMMITTEE ON
POPULATION & SOCIAL TRENDS

TABLE V

NATIVE BORN OF OTHER STATES LIVING IN IOWA,
NATIVE BORN OF IOWA LIVING IN OTHER STATES,
AND THEIR SUCCESSIVE INCREASES, 1870-1930*

Year	Native Born of Other States Living in Iowa		Native Born of Iowa Living in Other States	
	Number	Successive Increases	Number	Successive Increases
1	2	3	4	5
1870	560,246		89,011	
1880	625,651	65,405	217,289	128,378
1890	577,093	-48,558	398,985	181,596
1900	600,365	23,272	551,638	152,653
1910	524,780	-75,585	800,090	249,271
1920	543,646	18,866	920,301	119,492
1930	496,628	-47,018	1,084,164	163,859

* Based on Tables V and VI, Appendix.

in Iowa has declined for some states far beyond their probable deaths, the corresponding figures for other states have increased conspicuously. Obviously, shifts took place in the sources of immigration. The immigrants from the eastern states, Ohio, New York, Pennsylvania and others, who made up in the early days of Iowa's settlement 50 per cent of those born in other states, included only 12 per cent of those in 1930, due to deaths and emigration. Immigration from the western states has increased steadily, however, during recent decades. The absolute number of those who were born in the western states, Missouri, Minnesota, Nebraska, South Dakota, Kansas, and Colorado, and are living in Iowa, increased by approximately 50,000 between 1910 and 1920, and by 35,000 between 1920 and 1930. These net increases do not take into account the deaths that have occurred in these populations in the inter-censal years. Even when a conservative death rate of 10¹⁵ is applied for these populations, the

15. This is the approximate death rate for the state as a whole.

reported net increase is enlarged by about 10,000 for the 1910-1920 period and by about 13,000 for 1920-1930. Evidently, the recent immigration brought into Iowa from the western states about 60,000 persons between 1910 and 1920, and about 43,000 between 1920 and 1930.

No special tendency could be discovered in this recent immigration as to the place of settlement. It seems, however, that the bulk of the immigration from South Dakota goes to the rural districts, while that from Nebraska goes mainly to the urban centers.¹⁶

16. Examine: 15th Census of United States, "State of Birth of the Native Population", Tables 32, 33 and 34

There is a noticeable periodicity in the general trend of Iowa immigration. There was a heavy immigration between 1870 and 1880, followed by a small immigration between 1880 and 1890. A large immigration occurred again between 1890-1900, followed by an emigration between 1900-1910. Between 1910 and 1920 about 70,000 newcomers settled in Iowa, but only approximately 7,000 between 1920 and 1930.

Clearly, immigration from other states ceased to be the great factor in the growth of the Iowa population very early in the history of the state. The greatest influx of immigrants took place between 1840 and 1880. Iowa's population grew during these forty years from 43,000 to 1,625,000 persons, an increase of about 3,670 per cent. At about that time Iowa's settlement was essentially completed, and since then the growth of its population has been primarily dependent on its natural increase, i.e., the excess of births over deaths. At present the number of immigrants is not sufficient to offset the number of deaths of residents born in other states and the number of earlier immigrants who leave the

state so that their number in Iowa is steadily decreasing.

TABLE VI

IOWA IMMIGRATION AND EMIGRATION*

Years	Immigration from Other States	Emigration of Iowa Born
1	2	3
1870-1880	121,000	137,000
1880-1890	14,000	203,000
1890-1900	81,000	192,000
1900-1910	-15,000	304,000
1910-1920	71,000	199,000
1920-1930	7,000	250,000

* These data are computed from Table V, columns 3 and 5, to which numbers the probable number of deaths in the inter-censal years was added (a death rate of 10 was assumed).

Emigration from Iowa

From a total of 89,000 native Iowans living in other states in 1870, the number grew to 1,084,000 in 1930 (see Table V, also Table VI, Appendix), an increase of more than 1,100 per cent. In the year 1870, 17 per cent of the white persons born in Iowa were residents of other states; in 1930, their percentage had increased to about 38; evidently more than a third of the native Iowans live outside of the state. Iowa has been losing on the average more than 200,000 persons each decade since 1870.

TABLE VII

PERCENTAGE OF WHITE POPULATION BORN IN IOWA
LIVING IN OTHER STATES IN THE UNITED STATES*

1870	17.2	1910	36.1
1880	22.3	1920	36.1
1890	28.4	1930	37.6
1900	29.6		

* These figures do not include natives of Iowa living in Canada and in other foreign countries.

Emigration of native Iowans has been growing steadily. At the beginning of the century, there were as many Iowans living outside the state as there were persons from other states residing in Iowa (see Figure 5: Migration of Population to and from Iowa). Since that time, however, the picture has changed. The absolute number of those from other states residing in Iowa has been slowly declining, while the number of Iowans residing in other states has been rapidly increasing. Heavy emigration of native Iowans started as far back as the eighties. The greatest emigration occurred between 1900 and 1910. Approximately 300,000 Iowans left the state during that ten-year period. That emigration was too large to be offset by immigration and natural increase, so that Iowa suffered an absolute loss in population.¹⁷ Between 1910 and 1920, about

17. The census reported an absolute decrease of 7,082 in the Iowa population in 1900-1910.

200,000 Iowans left the state, and above 250,000 emigrated during the last decade.¹⁸

18. A detailed analysis of the recent emigration is taken up later.

In part, this emigration has moved to the large urban centers, especially to Chicago and to cities on the west coast; in part, it has gone to the rural sections of adjacent and western states.

In 1870, relatively large numbers of native Iowans were living in Missouri, Kansas, Illinois, and Nebraska; while in 1890, by far more Iowans were residents of Nebraska than of any other state, although large numbers were located in Kansas, South Dakota, and Missouri. The great emigration between 1900 and 1910 went mainly to nearby states, Minnesota, Missouri, Oklahoma, South Dakota, though the Pacific states, Washington, Oregon, and California received generous shares. About 80,000 persons born in Iowa emigrated to California during the decade 1920-1930; around 60,000 went to Illinois, about 18,000 to Minnesota, and approximately 15,000 to Wisconsin. Many Iowans also emigrated to Missouri, Oregon, Nebraska, and other western states. The Iowa emigrants to California and Illinois settled mainly in the large urban centers, with Chicago and Los Angeles receiving the largest numbers. Iowa emigrants to the other states reside chiefly in the small urban and rural places.

Of the 1,084,160 Iowa-born persons living in other states in 1930, the census reported 598,296 persons as emigrants from the urban population, and 485,864 Iowans as coming from the rural population. Of the latter, 271,285 were recorded as rural farm and 214,579 as rural non-farm. In 1930, 47.9 per cent of the urban born Iowans and 29.7 per cent of the rural born Iowans were reported residing in other states; 25.8 per cent of the total number of persons native to the rural farm population of Iowa and 36.6 per cent of the rural non-farm resided in other states. Any conclusion on the basis of these facts that it is the urban population which leaves the state should be weighed very cautiously. There is a constant intrastate migration from the farms and villages to the cities and from these to cities outside the state. The census figures for the number coming from cities in Iowa is consequently larger than it should be, because of the frequency with which persons who moved first from a farm or village to a city in Iowa subsequently report themselves to census enumerators as natives of that city. For that matter even when coming directly from the farms, without stopping in one of the intrastate centers, these emigrants prefer to register as born in a large city rather than in a small "inconspicuous" town. The great bulk of the urban emigration undoubtedly originated on the farms.

Foreign-born in Iowa

The influx of foreign-born into Iowa followed apparently the general pattern of immigration into Iowa from other states. The number of foreign-born residing in Iowa kept on increasing up to 1890 (Table VIII, Figure 7). Since then, their number has been rapidly declining. In 1890, Iowa counted about 324,000 foreign-born; in 1930, their number was approximately 166,000, a decline of about 50 per cent during the last forty years. The large decrease in the foreign population, especially during the last two decades, which by far exceeds the probable number of deaths in this population, indicates undoubtedly that emigration has also been taking place among the foreign-born, especially the males. The number of the foreign-born males declined from 127,000 in 1920 to 74,000 in 1930, a decline of about 42 per cent, exceeding by approximately 30 per cent the probable reduction by deaths. The foreign population as a whole decreased by 17.5 per cent during the period 1910-1920 and by 26.6 per cent during the following decade. With respect to the total population of the state their proportion has decreased from 17.1 per cent in 1870 to 6.7 per cent in 1930.

The distribution of the foreign-born population between the rural and urban centers hardly differs from that of the population as a whole. In 1910, 33 per cent of the foreign-born lived in the urban centers; in 1920 and 1930, there were 40 per cent¹⁹ and 42 per cent, respectively, of this total population in the cities.

19. For the population of the state as a whole, 31 per cent, 36 per cent, and 40 per cent were reported as urban for the years 1910, 1920, and 1930, respectively (Table II).

Nativity of Population

From the point of view of its composition with respect to nativity, the Iowa population is coming to be composed more and more of persons born in Iowa.

As shown in Table IX and portrayed in Figure 8, Iowa-born persons made up only 36 per cent of the total Iowa population in 1870, whereas in 1930 they made up 73.2 per cent of the population. To state this point conversely, the number and proportion of those born in other states, as well as of those born in foreign countries, has been steadily declining. In 1870, these outsiders made up 64 per cent of the population; in 1930, they comprised about 28 per cent of the total.

TABLE VIII

FOREIGN-BORN WHITES IN IOWA, 1870-1930

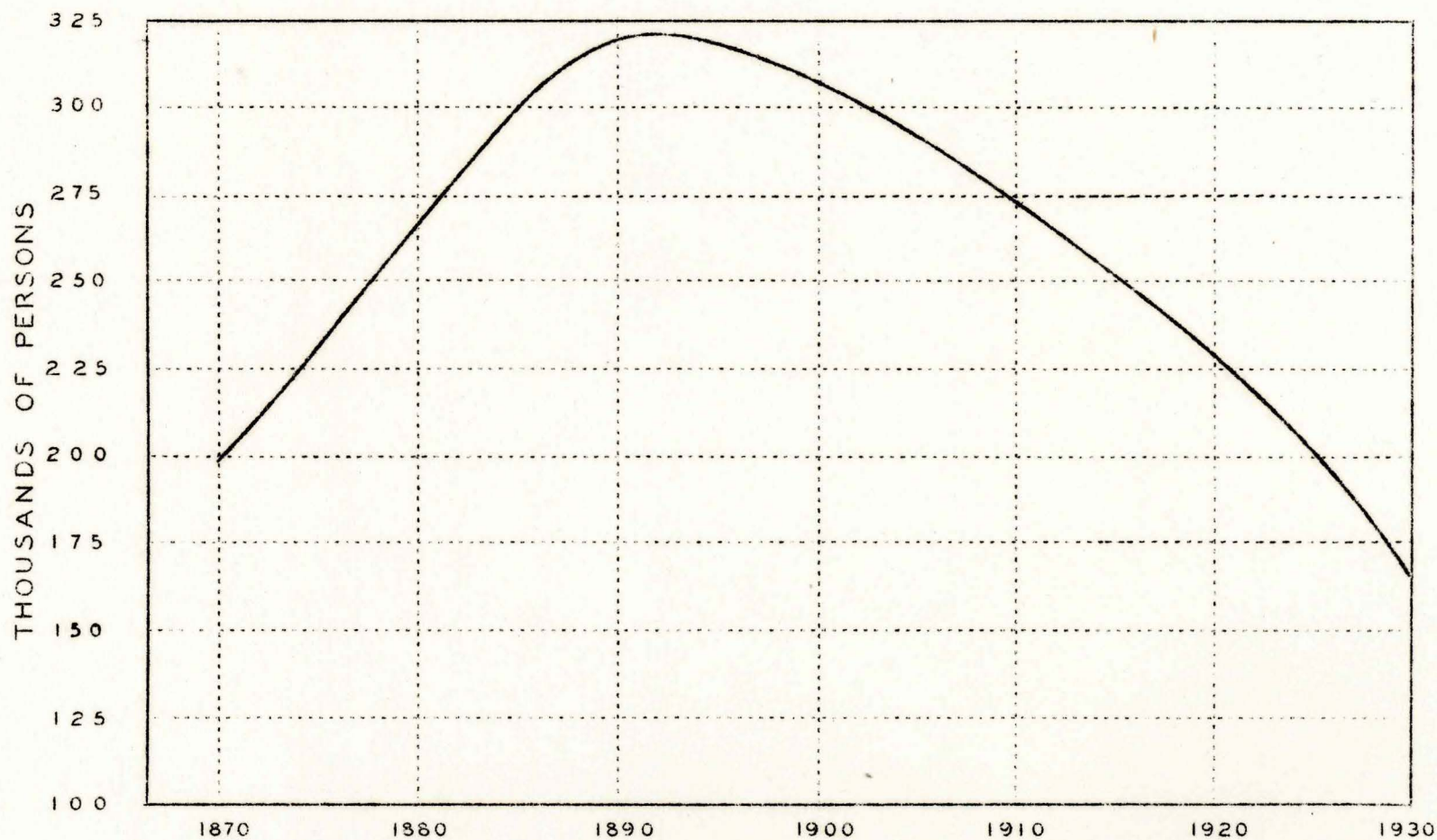
Year	Male	Female	Total	Per Cent of Total Population	Increase in Number	Increase Per Cent
1	2	3	4	5	6	7
1870	115,034	89,630	204,664	17.1		
1880	146,569	114,985	261,554	16.1	56,890	27.8
1890	180,376	143,556	323,932	17.0	62,378	23.8
1900	170,883	134,899	305,782	13.7	-18,150	- 5.6
1910	157,429	116,055	273,484	12.3	-32,298	-10.6
1920	127,065	98,582	225,647	9.4	-47,837	-17.5
1930	73,606	92,129	165,735	6.7	-59,912	-26.6

TABLE IX

PERCENTAGE OF IOWA POPULATION BORN IN IOWA,
BORN IN OTHER STATES, AND BORN ABROAD,
1870-1930

Years	Born in Iowa	Born in other states	Foreign- born
	%	%	%
1870	36.0	46.9	17.1
1880	45.4	38.5	16.1
1890	52.8	30.2	17.0
1900	59.8	26.5	13.7
1910	64.1	23.6	12.3
1920	68.0	22.6	9.4
1930	73.2	20.1	6.7

FOREIGN BORN WHITE POPULATION OF IOWA 1870-1930



IOWA STATE PLANNING BOARD




FIG. 7

W. P. A.
PROJECT
2 9 2 9

PERCENTAGES OF IOWA POPULATION BORN IN IOWA BORN IN OTHER STATES, AND BORN ABROAD 1870 TO 1930



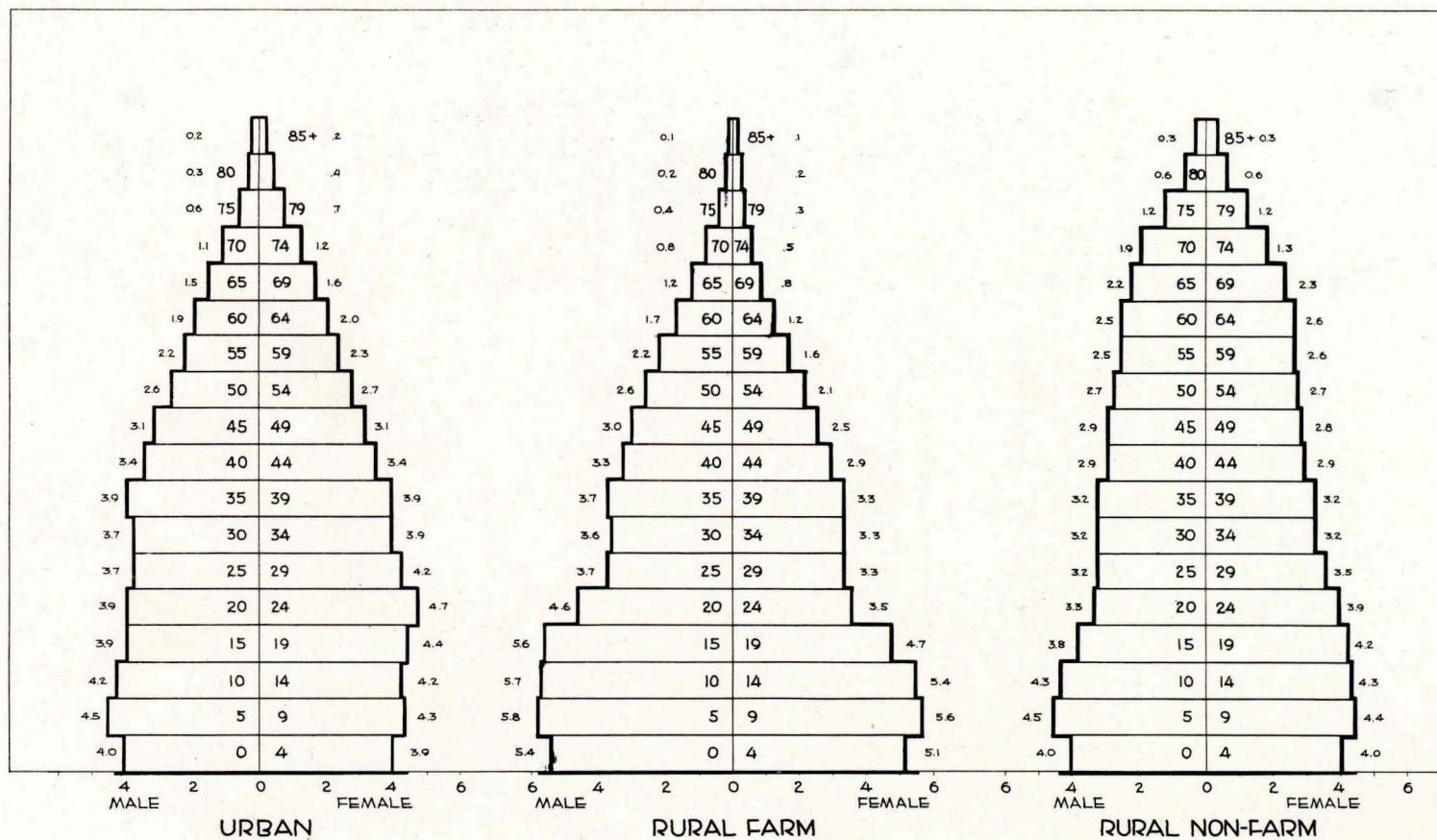
LEGEND

-  BORN IN IOWA, LIVING IN IOWA
-  BORN IN OTHER STATES, LIVING IN IOWA
-  BORN ABROAD, LIVING IN IOWA

W. P. A.
PROJECT
2 9 2 9

IOWA STATE PLANNING BOARD

FIG. 8



IOWA STATE PLANNING BOARD
COMPOSITION OF
POPULATION
AGE OF FARM, RURAL NON-FARM,
AND URBAN CLASSES - 1930

PREPARED BY
THE COMMITTEE ON
POPULATION & SOCIAL TRENDS

FIG. 9

AGE-COMPOSITION OF IOWA POPULATION

The age-composition of the Iowa population has greatly changed. There has been a gradual decline in the proportion in the younger age periods, accompanied by a corresponding increase in the proportion in the older age periods (see Figure 10). Whereas, in 1900, persons under twenty comprised about 44.2 per cent of the total population, in 1930 they comprised 37.2 per cent (Table X). The population in the age periods of 20 to 44 which had been increasing until 1920, dropped from 37.6 per cent to 36.1 per cent during the following decade.

On the other hand, the per cent of those in the older age groups has been rapidly increasing. The group from 45 to 64 years old rose during the same period from 13.8 per cent of the total population to 19.1 per cent; the group from 65 to 74 increased from 3.3 per cent to 5.1 per cent; and the group of 75 years and over rose from 1.6 to 2.3 per cent.

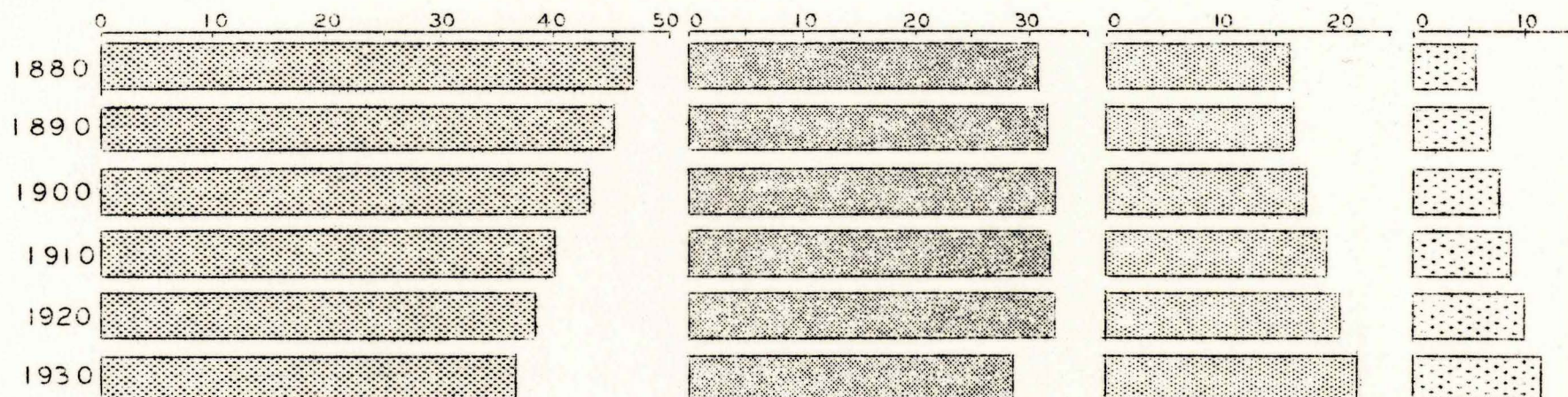
At present, Iowa population has a much older age-composition than the United States. At the beginning of the century, the age-composition of the two populations was almost the same. However, in 1930, persons under 45 years of age constituted 73 per cent of the population of Iowa, whereas persons of this age constituted 77 per cent of the population of the United States (Table X). In the same year persons over 45 made up 27 per cent of the population of Iowa and 23 per cent of the population of the United States. A sharper contrast between the populations is to be noticed when separate comparisons by age periods are made. The group above 65, for instance, constituted 7.4 per cent of the total Iowa population in 1930 as against 5.4 per cent for the entire United States. This difference is of importance when the problem of old age pensions, for instance, is considered.

These differences between the populations of Iowa and of the United States are explained, presumably, by the fact that immigration, which brought many young people, stopped playing any important part in the growth of the Iowa population much earlier than for the United States as a whole. Also emigration during recent decades has drawn off many young people from Iowa, but has merely relocated them in other parts of the United States and so has not affected the age composition of the total population as it has that of Iowa.

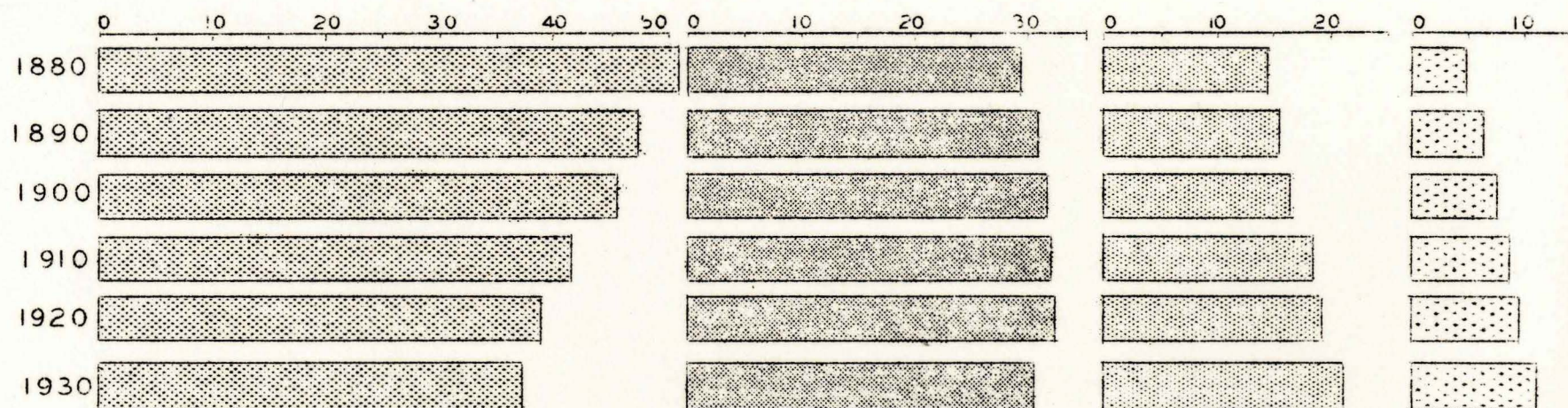
What is true for the Iowa population as a whole, holds true also for the urban and rural populations separately (see Table XI). The greatest changes took place in the under 20 group of the rural farm and rural non-farm populations, due obviously to emigration, and declines in the fertility rates.²⁰ Proportionally this group declined during the decade from 45.3 per

²⁰. See: Past and Present Births, Birth Rates, and Fertility Rates, *infra*.





PER CENT DISTRIBUTION OF IOWA MALE POPULATION BY BROAD AGE PERIODS 1880-1930



PER CENT DISTRIBUTION OF IOWA FEMALE POPULATION BY BROAD AGE PERIODS 1880-1930



LEGEND

-  PERCENTAGE OF POPULATION 0-19 YEARS OF AGE
-  PERCENTAGE OF POPULATION 20-39 YEARS OF AGE
-  PERCENTAGE OF POPULATION 40-59 YEARS OF AGE
-  PERCENTAGE OF POPULATION OVER 60 YEARS OF AGE

IOWA STATE PLANNING BOARD

FIG. 10

W. P. A.
PROJECT
2929

TABLE X

PER CENT DISTRIBUTION BY BROAD AGE PERIODS SINCE 1900,
IOWA AND THE UNITED STATES*

Age Period	Iowa				United States			
	1900	1910	1920	1930	1900	1910	1920	1930
1	2	3	4	5	6	7	8	9
0-19	44.2	41.0	38.8	37.2	44.3	42.0	40.7	38.8
20-44	37.0	37.4	37.6	36.1	37.7	39.0	38.4	38.3
45-64	13.8	15.8	17.5	19.1	13.7	14.6	16.2	17.4
65-74	3.3	3.8	4.0	5.1	2.9	5.0	3.3	5.8
75-over	1.6	2.1	2.1	2.3	1.1	1.1	1.3	1.6

* Based on Federal Census

cent to 43.4 per cent, the largest decline, in the rural farm group, and from 35.4 per cent to 33.7 per cent in the non-farm group. The decrease in the corresponding group of the urban population is negligible, owing to the city-ward movement of the younger ages from the farm and non-farm populations. In the 20-45 group the rural non-farm population showed the largest decline, with the urban and the farm populations following in order.

The rural farm population is still the youngest of these three populations, a fact to be explained only by the high differential fertility of the farm population (see Figure 9).

The situation of a rapidly aging population is even more conspicuously brought out when the actual numbers, not the percentages, (Table VII, Appendix) of these groups in 1920 and 1930 are contrasted. The great decrease in the number of children under five and under ten years of age in the rural population should be noticed. The number of children under five years of age declined by about 20 per cent in the rural farm population, and by about 16 per cent in the rural non-farm, between 1920 and 1930. The small increase in the corresponding groups of the urban population is due only to immigration, as the fertility of the urban population is not sufficient to keep it from rapid decrease.

Taking 1880 as the basis for comparison for each group of the total population separately, one notices the large variations in the growth of the separate groups. From 1880 to 1930 the population of the state as a whole increased 50 per cent. But as shown by Table XII, the group under 20 years of age was in 1930 only 13 per cent larger than in 1880. The next group, from 20 to 39 years of age, increased by 50 per cent, just keeping pace with the general rate of increase. However, the group from 40 to 59 more than doubled during this period; the 60 to 79 group more than tripled; and the group of 80 and above quintupled. Obviously, the primary increase of the population took place solely in the age groups of above forty.

The population will grow even older as time goes on.

TABLE XI

PER CENT DISTRIBUTION BY BROAD AGE PERIODS OF
IOWA URBAN, RURAL FARM, AND RURAL NON-FARM POPULATION*

Age	Urban		Rural Farm		Rural Non-Farm	
	1920	1930	1920	1930	1920	1930
1	2	3	4	5	6	7
0-19	35.6	33.5	45.5	43.4	35.4	33.7
20-44	41.0	39.0	36.5	35.3	34.4	32.4
45-64	18.9	20.0	14.5	16.8	20.1	21.3
65-74	4.3	5.3	2.4	3.3	6.5	8.2
75-over	2.0	2.3	1.1	1.2	3.4	4.3

* United States Census

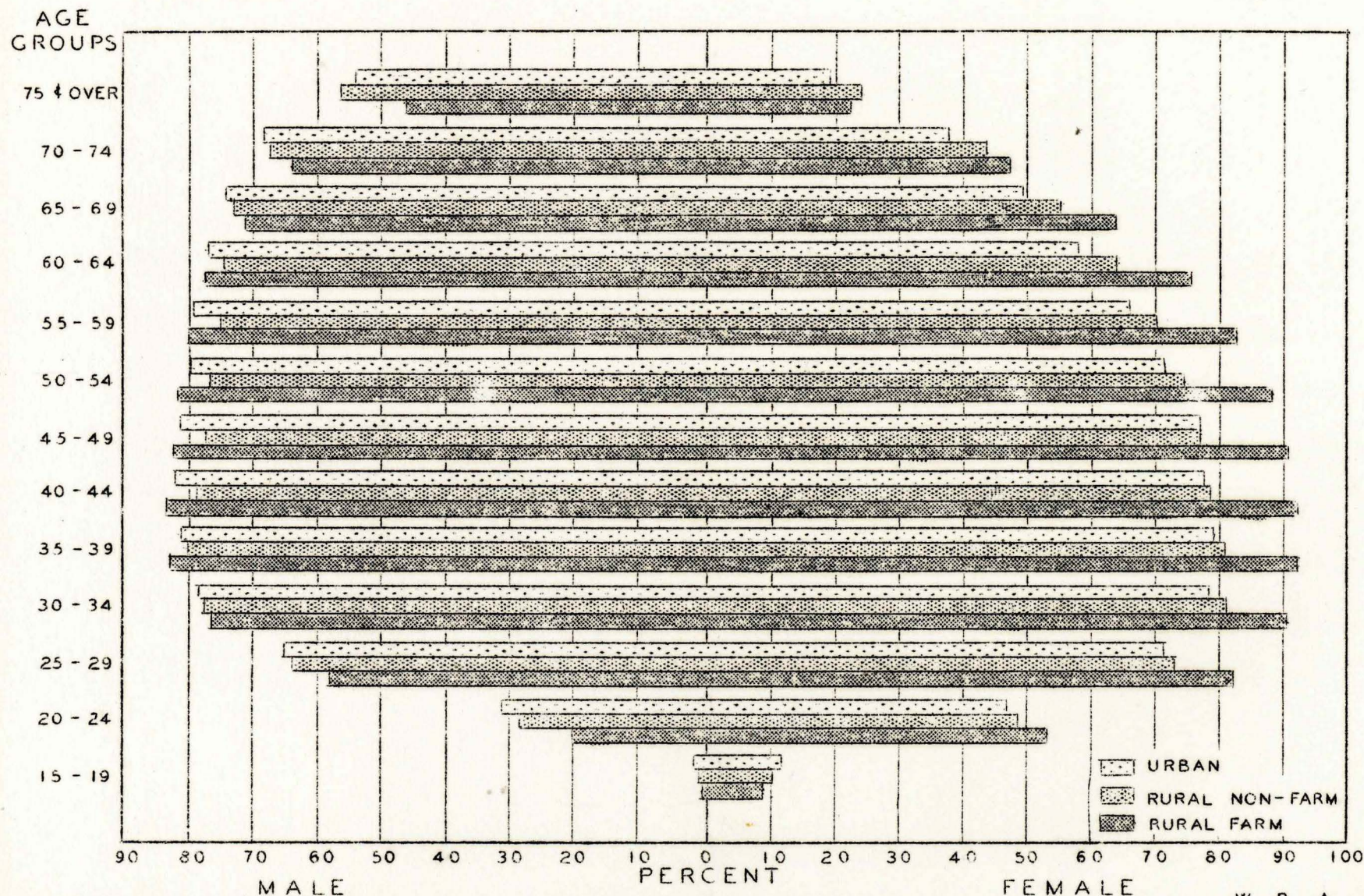
TABLE XII

IOWA POPULATION BY BROAD AGE GROUPS, 1880-1930, COMPARED WITH 1880

Age	1880	1890	1900	1910	1920	1930
1	2	3	4	5	6	7
Under 20	100	110	121	112	115	113
20-39	100	121	144	144	157	151
40-59	100	123	154	172	197	220
60-79	100	155	198	226	270	336
80-over	100	178	259	359	427	515
TOTAL	100	118	137	137	148	152

PER CENT OF POPULATION MARRIED, BY AGE GROUPS, BY SEX, AND BY RURAL FARM, RURAL NON-FARM, AND URBAN DIVISIONS

1930



MARITAL CONDITION OF IOWA POPULATION

There has been a general increase since the beginning of the present century in the percentage of married persons in every age group from 15-19 to 35-44. During the last forty years the per cent married in the youngest marriageable age group of 15-19 rose in the male population of Iowa from 0.2 per cent in 1890, to 1.1 per cent in 1930, and in the female population from 6.7 per cent to 9.4 per cent during the same period. These facts obviously do not support the popular opinion that marriages are in general postponed until later in life. It is probably true for certain classes, but not for the population as a whole.

In the 20-24 age group of males, the proportion married increased steadily from 13.4 per cent in 1890 to 25.3 per cent in 1930 (Table XIII, Figure 12). Among the females of the same age there was a slight decline from 44.8 per cent in 1890 to 44.4 per cent in 1900, and from then on a rather consistent increase reaching 48.8 per cent in 1930.

In the next age group, 25-34, there was a slight downward movement in the male population from 1890 to 1900; the proportion of males married dropped 1.5 per cent from 1890 to 1900. During the next ten years there was an offsetting increase, followed by a more substantial increase, from 61.6 per cent to 69.4 per cent, during the next two decades. Among the females of this age group there was a sharp decline from 79.6 per cent in 1890 to 76.0 per cent in 1900, and a less rapid decline from 1900 to 1910; since 1910 there has been a steady increase from 75.5 per cent to 78.9 per cent in 1930.

The 35-44 age group shows the same trend, a downward movement from 1890, reaching the lowest point for the males in 1910, and for the females in 1920, and since then an upward swing. The percentage of married males in this group was 82.2 in 1930, and of married females, 83.6.

In all the older age groups, there has been a decline in the proportion of married men. Among the older women, on the other hand, an upward trend since 1920 appears also in the 45-54 age group; however, the proportion of married women is smaller in 1930 than in 1890.

Comparison of the percentages for males and females shows that for corresponding ages from 15 to 54, the ratio of married to unmarried persons is higher for females than for males. In the older age groups, however, the percentage of married males exceeds that of married females. This disparity in the percentages of married males and females is to be explained by the tendency of men to marry at later ages than women.

The urban population leads in the percentages of married males up to age thirty-five (see Tables XIVA and XIVB, and Figure 1F). The rural farm population shows in these groups the lowest percentages, whereas the rural non-farm population occupies a mid-position. From age thirty-five

TABLE XIII

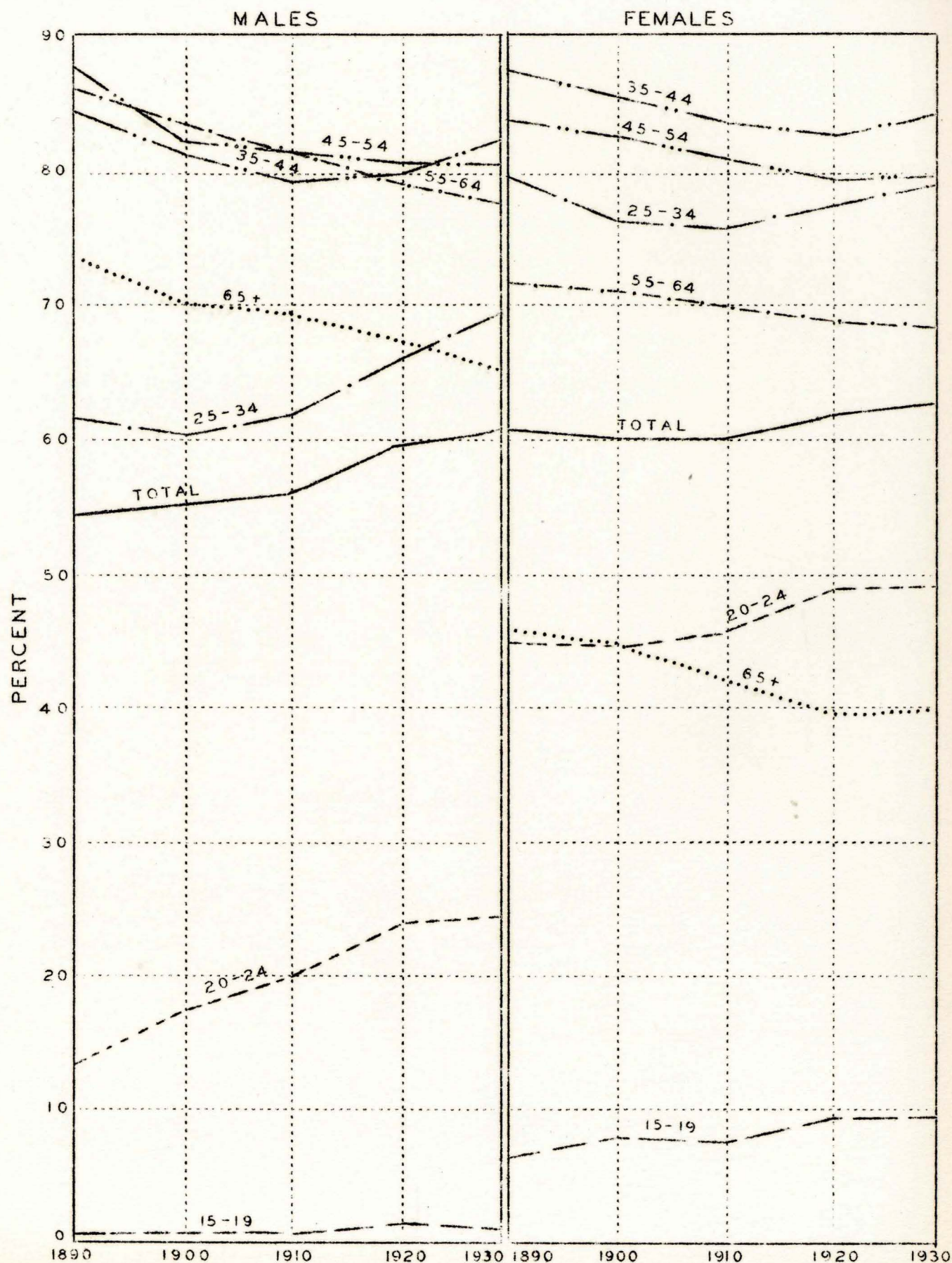
MARITAL CONDITION OF THE POPULATION OF IOWA*

Fifteen Years of Age and Over by Sex and Age Classes in Per Cent, 1890-1930

	Single					Married				
	1890	1900	1910	1920	1930	1890	1900	1910	1920	1930
<u>Males</u>										
All Classes	41.7	40.1	38.6	35.1	33.2	54.2	54.9	55.9	59.2	60.6
15-19	99.8	99.5	98.5	98.4	98.8	0.2	0.4	0.6	1.3	1.1
20-24	86.4	82.5	79.0	74.2	74.0	13.4	17.2	20.0	25.0	25.3
25-34	37.0	38.4	36.6	32.1	28.5	61.6	60.1	61.6	65.9	69.4
35-44	12.2	15.5	17.0	16.7	14.2	84.6	81.1	79.4	79.6	82.2
45-54	6.5	8.7	9.6	12.9	13.2	87.9	82.2	82.2	80.8	80.6
55-64	4.3	5.2		9.8	11.6	86.0	83.7		79.2	77.7
65-over	3.5	3.6	4.4	5.9	8.5	73.5	70.2	69.1	67.2	65.1
<u>Females</u>										
All Classes	31.0	30.8	29.8	27.4	26.0	60.4	59.9	60.0	61.6	62.3
15-19	93.2	91.9	91.4	90.5	90.3	6.7	8.0	7.8	9.2	9.4
20-24	54.4	54.7	53.6	49.9	49.7	44.8	44.4	45.2	48.5	48.8
25-34	17.8	21.4	21.8	19.8	17.9	79.6	76.0	75.5	77.0	78.9
35-44	6.1	8.8	10.8	11.5	10.5	87.8	85.3	83.4	82.5	83.6
45-54	3.4	5.0	6.2	9.1	9.6	83.8	82.2	77.0	79.0	79.1
55-64	2.3	3.3		6.9	8.6	71.7	71.0		68.8	68.3
65-over	2.3	2.6	3.3	4.3	6.4	45.8	44.3	42.1	39.4	39.9

* Adopted from United States Census Reports

PERCENTAGE OF IOWA POPULATION 15 YEARS OF AGE AND OVER, MARRIED, BY AGE AND SEX, 1890-1930



up to age sixty, however, the rural population leads in percentage of married males; the urban male population is next; and the rural non-farm has the lowest percentage. From sixty up to seventy-five the urban population again leads, the rural farm population is lowest, and the rural non-farm is in a mid-position. In the age group 75 and above, it is the rural non-farm population that leads in per cent of married males.

Within the female population the proportion of married females in the rural farm population is much higher than in either urban or rural non-farm populations in all age groups except the very youngest of 15-19 and the very oldest of 75 and above.

These differences, the lower percentage of the married males in the rural population up to age thirty-five and the higher percentage of the married females in the same population, are to be explained partly by the heavy emigration that has been taking place from the Iowa rural population.

The relative number of widowers shows a slight trend downward during the last forty years. This trend might be explained in part by an increase in the proportion of widowed males remarrying.

The proportion of widows is several times as high as the corresponding proportion of widowers. In the 45-54 age group the percentage of widows is 9.4 and the percentage of widowers is 4.1. In the group 55-64, the corresponding percentages are 21.6 and 8.9, and in the group 65 and over, 52.9 and 24.9, respectively. These differences are due to two facts. In the first place, more marriages are broken up by the death of the husband, as the death rates of males are higher in all ages and the husband is usually older than his wife. In the second place, although less important, remarriages occur more frequently among the widowers.

Statistics for the past forty years show that the divorce rate has been increasing rather steadily. One has, however, to realize in analyzing these statistics that they do not furnish a true index of the amount of divorce. The census figures show only the number of persons who are divorced at a given time; they do not include those who have been divorced and remarried.

TABLE XIVA

PER CENT DISTRIBUTION BY MARITAL CONDITION OF THE URBAN, RURAL FARM, AND
RURAL NON-FARM POPULATION 15 YEARS OLD AND OVER, BY SEX, IOWA, 1930*

Age	URBAN				RURAL FARM				RURAL NON-FARM			
	Mar- ried	Sin- gle	Wid- owed	Di- vorced	Mar- ried	Sin- gle	Wid- owed	Di- vorced	Mar- ried	Sin- gle	Wid- owed	Di- vorced
1	2	3	4	5	6	7	8	9	10	11	12	13
Total	63.4	29.6	4.9	2.0	57.3	38.2	3.8	0.6	61.4	30.6	6.5	1.3
15-19	1.6	98.3	(x)	(x)	0.7	99.2	(x)	(x)	1.2	98.7	---	(x)
20-24	30.4	68.6	0.1	0.8	19.9	79.6	0.1	0.2	28.0	71.4	0.1	0.3
25-29	65.1	32.4	0.5	2.0	57.3	41.7	0.4	0.5	63.6	35.0	0.4	0.9
30-34	78.5	17.9	1.0	2.5	76.1	22.4	0.8	0.6	77.3	20.3	1.0	1.2
35-39	81.8	13.7	1.6	2.8	83.0	15.0	1.3	0.5	80.6	16.3	1.6	1.4
40-44	82.6	12.1	2.5	2.8	84.0	13.3	2.0	0.7	78.6	17.0	2.5	1.7
45-49	81.5	11.8	3.6	3.1	83.0	13.3	2.8	0.9	76.7	17.4	3.8	2.0
50-54	80.4	11.2	5.4	2.9	81.9	12.6	4.5	1.0	76.2	16.2	5.3	2.1
55-59	79.6	10.2	7.5	2.7	80.4	12.0	6.6	1.0	75.1	14.7	7.9	2.0
60-64	77.3	9.3	11.1	2.2	76.8	11.8	10.2	1.1	74.2	13.0	10.8	1.8
65-69	74.2	8.1	15.4	2.1	71.2	11.4	16.1	1.1	72.8	11.1	14.5	1.4
70-74	68.5	7.0	22.9	0.6	63.9	9.8	25.0	1.3	67.9	9.6	20.9	1.4
75-over	54.0	4.7	40.2	0.1	46.1	7.4	45.4	0.9	55.8	7.3	35.7	1.0

* United States Census

(x) Less than 0.1

TABLE XIVE

PER CENT DISTRIBUTION BY MARITAL CONDITION OF THE URBAN, RURAL FARM, AND
RURAL NON-FARM POPULATION 15 YEARS OLD AND OVER, BY SEX, IOWA, 1930*

Age	<u>Females</u>											
	URBAN				RURAL FARM				RURAL NON-FARM			
	Mar- ried	Sin- gle	Wid- owed	Di- vorced	Mar- ried	Sin- gle	Wid- owed	Di- vorced	Mar- ried	Sin- gle	Wid- owed	Di- vorced
1	2	3	4	5	6	7	8	9	10	11	12	13
Total	59.0	27.0	11.7	2.3	63.8	25.2	5.5	0.4	59.1	25.1	14.5	1.1
15-19	10.7	88.9	(x)	0.3	8.1	91.8	(x)	(x)	9.7	90.1	(x)	0.1
20-24	46.3	51.6	0.3	1.7	52.8	46.4	0.2	0.4	47.7	51.1	0.4	0.7
25-29	71.0	25.0	1.2	2.8	81.9	16.9	0.5	0.7	72.4	25.3	1.0	1.2
30-34	78.2	16.4	2.1	3.2	90.0	8.7	0.8	0.5	80.7	15.3	2.3	1.6
35-39	78.9	13.7	3.9	3.5	92.3	6.0	1.2	0.4	80.6	13.3	4.2	1.9
40-44	77.5	12.6	6.4	3.3	92.2	5.4	2.0	0.3	78.4	13.2	6.5	1.7
45-49	75.9	11.4	9.4	3.2	90.5	5.2	3.7	0.5	75.8	13.2	9.2	1.6
50-54	71.0	11.4	14.7	2.8	87.3	5.5	6.7	0.5	73.8	11.5	12.9	1.6
55-59	65.4	10.8	21.2	2.4	83.3	5.1	10.9	0.6	70.3	10.1	18.1	1.4
60-64	57.5	10.0	30.8	1.7	75.4	5.4	18.8	0.4	63.6	8.1	26.9	1.2
65-69	48.4	8.5	41.5	1.4	63.5	6.0	29.9	0.5	55.3	6.9	36.8	0.8
70-74	37.4	7.7	53.7	1.0	46.4	5.7	47.5	0.4	42.9	5.9	50.4	0.6
75-over	19.0	5.5	75.0	0.3	21.5	4.0	74.1	0.3	23.4	4.7	71.4	0.4

* United States Census

(x) Less than 0.1

POPULATION GROWTH 1920-'30

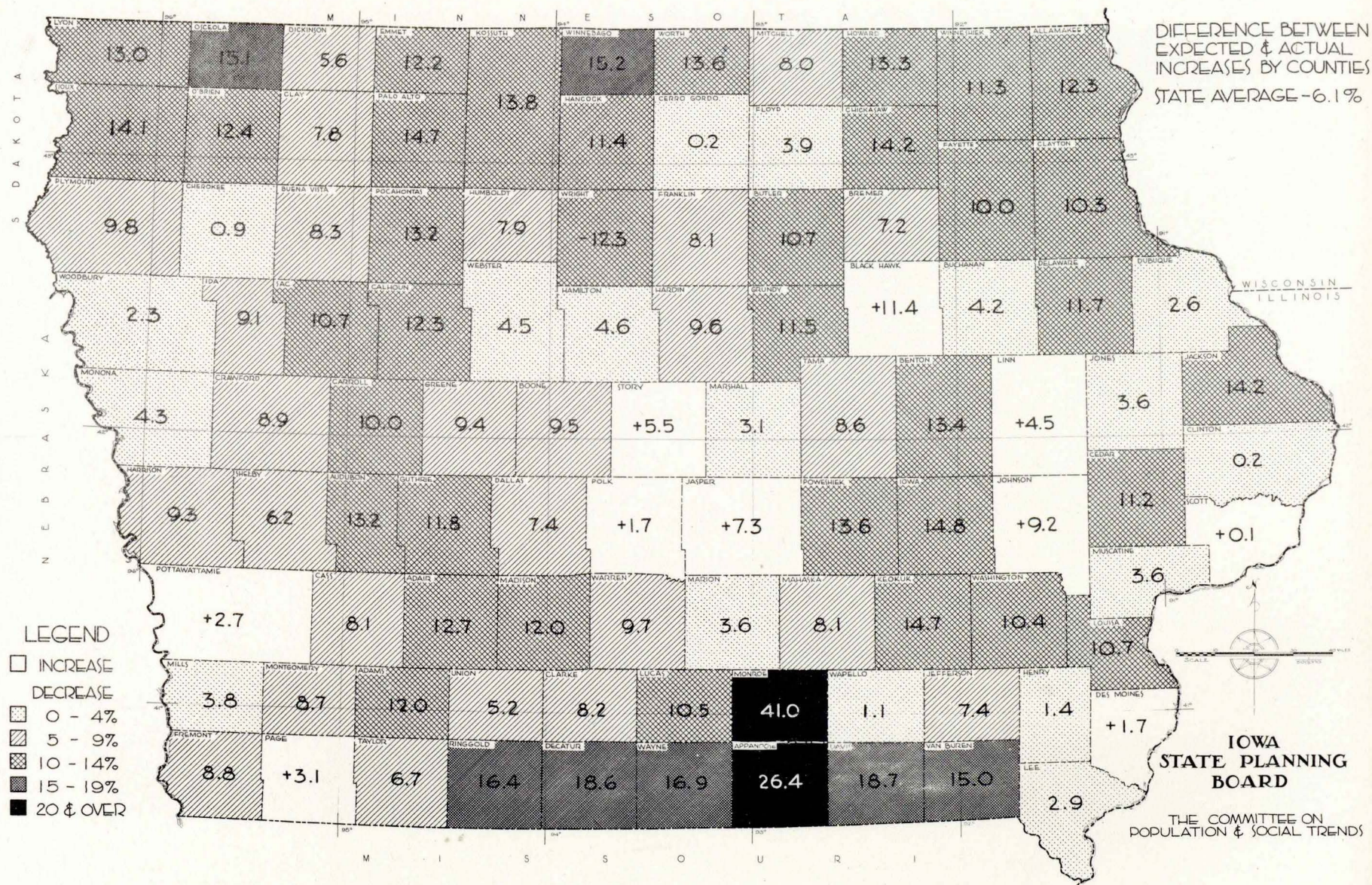


FIG. 13

RECENT MIGRATION OF IOWA POPULATION

During the decade 1920-1930, there were about 476,000 births and 249,000 deaths in Iowa, making an excess of births over deaths of about 227,000. It is by this number, then, that Iowa's population would have increased during this decade, if it had not been affected by immigration and emigration. However, the actual increase was only 67,000. Evidently, 160,000 more persons left Iowa than moved into the state during the ten years from 1920 to 1930.

Gains and Losses by Counties

In order to discover the origin of this emigration by counties, the expected population of each county in 1930 was approximated on the basis of the 1920 enumeration and the estimated number of births and deaths that occurred during the following decade; this expected population was then compared with the actual population at the end of the decade as shown by the enumeration of 1930. The differences expressed in terms of actual numbers and percentages are given in Table XV and Figure 13. (See notes to Table.)

It was found that ten out of ninety-nine counties gained in population above their own expected natural increase, but that these gains were mostly small. The only counties that registered substantial gains were Black Hawk (11.4%), Johnson (9.2%), and Jasper (7.8%). The average gain in the ten counties was 4.7 per cent. The losses in the remaining eighty-nine counties ranged from 0.2 per cent to 41 per cent, with an average of approximately 11 per cent per county. The greatest loss took place in Monroe County (-41.0); the smallest in Cerro Gordo and Clinton (-0.2 each). The loss for the state as a whole was 6.1 per cent during the last decade.

Gains and Losses in Urban and Rural Populations

The 1930 Census reported a decrease of 2.4 per cent for the rural farm population and an increase of 11.9 per cent for the urban population, during the 1920-1930 decade (Table II). Neither of these cases included a consideration of the natural increase of the population. The expected increase could not be estimated for the urban and rural groups separately as these groups are defined in the Census,²¹ for the Birth and Death

21. The Census defines as urban all places above 2500 persons and the remainder as rural, whereas the Birth and Death Statistics define as urban, cities above 10,000 persons and the remainder below 10,000 as rural.

TABLE XV

EXPECTED AND ACTUAL POPULATION OF IOWA; ITS GAINS (+)
AND LOSSES (-) AND PER CENT OF GAINS AND LOSSES
THROUGH MIGRATION 1920-1930, BY COUNTIES*

	Expected Population	Actual Population (1930 Census)	Gains (+) and Losses(-)	Per Cent of Gains and Losses
1	2	3	4 = (2-3)	5 = (4:2)
The State	2,632,357	2,470,939	-161,418	- 6.1
Adair	15,905	13,891	-2,014	-12.7
Adams	11,862	10,437	-1,425	-12.0
Allamakee	18,625	16,328	-2,297	-12.3
Appanoose	33,744	24,835	-8,909	-26.4
Audubon	14,131	12,264	-1,867	-13.2
Benton	26,589	22,851	-3,538	-13.4
Black Hawk	62,087	69,146	7,059	11.4
Boone	32,352	29,271	-3,081	- 9.5
Bremer	18,368	17,046	-1,322	- 7.2
Buchanan	20,401	19,550	- 851	- 4.2
Buena Vista	20,346	18,667	-1,679	- 8.3
Butler	19,724	17,617	-2,107	-10.7
Calhoun	20,062	17,605	-2,457	-12.3
Carroll	24,808	22,326	-2,482	-10.0
Cass	21,124	19,422	-1,702	- 8.1
Cedar	18,864	16,760	-2,104	-11.2
Cerro Gordo	38,539	38,476	- 63	- 0.2
Cherokee	18,909	18,737	- 172	- 0.9

	Expected Population	Actual Population (1930 Census)	Gains (+) and Losses (-)	Per Cent of Gains and Losses
1	2	3	4 = (2-3)	5 = (4:2)
Chickasaw	17,053	14,637	-2,416	-14.2
Clarke	11,516	10,384	- 932	- 8.2
Clay	17,478	16,107	-1,371	- 7.8
Clayton	27,382	24,559	-2,823	-10.3
Clinton	44,479	44,377	- 102	- 0.2
Crawford	23,086	21,028	-2,058	- 8.9
Dallas	27,540	25,493	-2,047	- 7.4
Davis	13,718	11,150	-2,568	-18.7
Decatur	18,298	14,903	-3,395	-18.6
Delaware	20,520	18,122	-2,398	-11.7
Des Moines	37,537	38,162	625	1.7
Dickinson	11,634	10,982	- 652	- 5.6
Dubuque	62,853	61,214	-1,639	- 2.6
Emmet	14,644	12,856	-1,788	-12.2
Fayette	32,370	29,145	-3,225	-10.0
Floyd	20,326	19,524	- 802	- 3.9
Franklin	17,825	16,382	-1,443	- 8.1
Fremont	17,029	15,533	-1,496	- 8.8
Greene	18,249	16,528	-1,721	- 9.4
Grundy	15,972	14,133	-1,839	-11.5
Guthrie	19,643	17,324	-2,319	-11.8
Hamilton	21,987	20,978	-1,009	- 4.6

	Expected Population	Actual Population (1930 Census)	Gains (+) and Losses(-)	Per Cent of Gains and Losses
1	2	3	4 = (2-3)	5 = (4:2)
Hancock	16,703	14,802	-1,901	-11.4
Hardin	25,391	22,947	-2,444	- 9.6
Harrison	27,438	24,897	-2,541	- 9.3
Henry	17,909	17,660	- 249	- 1.4
Howard	15,088	13,082	-2,006	-13.3
Humboldt	14,339	13,202	-1,137	- 7.9
Ida	13,126	11,933	-1,193	- 9.1
Iowa	20,349	17,332	-3,017	-14.8
Jackson	21,532	18,481	-3,051	-14.2
Jasper	30,705	32,936	2,231	7.3
Jefferson	17,546	16,241	-1,305	- 7.4
Johnson	27,722	30,276	2,554	9.2
Jones	19,928	19,206	- 722	- 3.6
Keokuk	22,460	19,148	-3,312	-14.7
Kossuth	29,512	25,452	-4,060	-13.8
Lee	42,502	41,268	-1,234	- 2.9
Linn	78,809	82,336	3,527	4.5
Louisa	12,969	11,575	-1,394	-10.7
Lucas	16,890	15,114	-1,776	-10.5
Lyon	17,581	15,293	-2,288	-13.0
Madison	16,286	14,331	-1,955	-12.0
Mahaska	28,083	25,804	-2,279	- 8.1
Marion	26,697	25,727	- 970	- 3.6

	Expected Population	Actual Population (1930 Census)	Gains (+) and Losses(-)	Per Cent of Gains and Losses
1	2	3	4 = (2-3)	5 = (4:2)
Marshall	34,799	33,727	-1,072	- 3.1
Mills	16,488	15,866	- 622	- 3.8
Mitchell	15,279	14,065	-1,214	- 8.0
Monona	19,026	18,213	- 813	- 4.3
Monroe	25,446	15,010	-10,436	-41.0
Montgomery	18,348	16,752	-1,596	- 8.7
Muscatine	30,492	29,385	-1,107	- 3.6
O'Brien	21,015	18,409	-2,606	-12.4
Osceola	11,997	10,182	-1,815	-15.1
Page	25,122	25,904	782	3.1
Palo Alto	18,045	15,398	-2,647	-14.7
Plymouth	26,782	24,159	-2,623	- 9.8
Pocahontas	18,068	15,687	-2,381	-13.2
Polk	170,027	172,837	2,810	1.7
Pottawattamie	68,061	69,888	1,827	2.7
Poweshiek	21,679	18,727	-2,952	-13.6
Ringgold	14,312	11,966	-2,346	-16.4
Sac	19,749	17,641	-2,108	-10.7
Scott	77,230	77,332	102	0.1
Shelby	18,265	17,131	-1,134	- 6.2
Sioux	31,197	26,806	-4,391	-14.1
Story	29,516	31,141	1,625	5.5

	Expected Population	Actual Population (1930 Census)	Gains (+) and Losses (-)	Per Cent of Gains and Losses
1	2	3	4 = (2-3)	5 = (4:2)
Tama	24,068	21,987	-2,081	- 8.6
Taylor	15,928	14,859	-1,069	- 6.7
Union	18,291	17,435	- 956	- 5.2
Van Buren	14,819	12,603	-2,216	-15.0
Wapello	40,920	40,480	- 440	- 1.1
Warren	19,593	17,700	-1,893	- 9.7
Washington	22,127	19,822	-2,305	-10.4
Wayne	16,596	13,787	-2,809	-16.9
Webster	42,318	40,425	-1,893	- 4.5
Winnebago	15,497	13,143	-2,354	-15.2
Winneshiek	24,381	21,630	-2,751	-11.3
Woodbury	104,060	101,669	-2,391	- 2.3
Worth	12,920	11,164	-1,756	-13.6
Wright	23,052	20,216	-2,836	-12.3

*The expected population was calculated on the basis of the 1920 population to which the natural increase was added. The latter is the excess of births over deaths as reported by the Birth, Stillbirth and Infant Mortality Statistics. This, however, is given only since 1924 when Iowa was included in the Registration Area. For the previous years the excess was approximated.

statistics give the number of births and deaths only for urban centers of 10,000 and above.

An examination of Table XVI shows that the eighteen cities of Iowa having populations above 10,000 increased in numbers during the last decade by approximately 80,000 persons, an increase of 13 per cent. When, however, allowance is made for the natural increase, this city population will show an increase through immigration of only about 28,000 persons, or approximately 5 per cent. Iowa City, Waterloo, Cedar Rapids, and Ottumwa were the only cities that increased substantially by newcomers. The rest of Iowa's larger cities either show a decrease or a negligible increase above their expected natural increase.

Since the net loss in population through migration for the state as a whole during the decade 1920-1930 appears to have been 160,000 notwithstanding a net gain through migration of about 28,000 urban residents, it is apparent that the rural population suffered a net loss of about 188,000 persons.

Without knowledge of further particulars, it is impossible to say what happened to the 188,000 persons that were lost to the rural groups. It is evident that for the state as a whole there was a heavy emigration, but whether the movement was directly from the rural districts to points outside the state or from the rural districts to cities within the state and from these cities to other states is mostly a matter of conjecture. Seemingly the direction of movement differed to some extent for males and females; the females moving to cities within the state and the males moving to cities outside the state.

Gains and Losses by Age Groups

To discover the incidence of emigration upon the different age groups in the Iowa population from 1920 to 1930, the number in each age group as shown by the enumeration in 1930 was compared with the numbers that would have appeared in this group had it contained all (and only) the survivors of the group ten years younger in 1920. Except as affected by immigration and emigration, the group 10-14 years old in 1930 was made up of the survivors from the group under five years old in 1920; the group 20-24 years old in 1930 was made up of the survivors from the 10-14 group of 1920, and so on.²²

22. For detailed explanation, see Bernard D. Karpinos: The Natural Increase of the Population of Iowa When Corrected for Age Distribution, M.A. Thesis, State University of Iowa, 1932.

The losses and gains by age groups, as determined by this procedure, are summarized in Table XVII and Figure 14. The greatest net loss in the total population of the state took place in the middle age groups for both

TABLE XVI

ACTUAL INCREASE, EXPECTED NATURAL INCREASE, AND THE
GAINS AND LOSSES OF CITIES IN IOWA HAVING 10,000
AND MORE POPULATION, 1920-1930

City	Population		Actual Increase	Expected Natural Increase	Gains and Losses	
	1920	1930				
1	2	3	4	5	6 (4-5)	7 %
Ames*	6,270	10,261	3,991	-----	-----	---
Boone	12,451	11,886	- 565	1,029	-1,594	-11.8
Burlington	24,057	26,775	2,718	1,363	1,355	5.3
Cedar Rapids	45,566	56,097	10,531	3,829	6,702	13.6
Clinton	24,151	25,726	1,575	732	843	3.4
Council Bluffs	36,162	42,048	5,886	3,742	2,144	5.4
Davenport	56,727	60,751	4,024	1,935	2,089	3.6
Des Moines	126,468	142,559	16,091	14,452	1,639	1.2
Dubuque	39,141	41,679	2,538	2,344	194	0.5
Fort Dodge	19,347	21,895	2,548	2,398	150	0.7
Ft. Madison	12,066	13,779	1,713	1,074	639	4.9
Iowa City	11,267	15,340	4,073	487	3,586	30.5
Keokuk	14,423	15,106	683	894	- 211	- 1.4
Marshalltown	15,731	17,373	1,642	599	1,043	6.4
Mason City	20,065	23,304	3,239	2,491	748	3.3
Muscatine	16,068	16,778	710	585	125	0.8
Newton*	6,627	11,560	4,933	-----	-----	---
Oskaloosa*	9,427	10,123	696	-----	-----	---
Ottumwa	23,003	28,075	5,072	2,098	2,974	11.8
Sioux City	71,227	79,183	7,956	8,917	- 961	- 1.2
Waterloo	36,230	46,191	<u>9,961</u>	<u>3,682</u>	<u>6,279</u>	15.7
Total			80,395	52,651	27,744	

*No separate reports on births and deaths for these cities in Births, Stillbirths, and Mortality Statistics. Their actual increase not included in the total.

TABLE XVII

PER CENT GAINS AND LOSSES IN IOWA POPULATION THROUGH MIGRATION, BY AGE GROUPS
AND SEX; TOTAL, URBAN, RURAL FARM, AND RURAL NON-FARM POPULATION, 1920-1930

Age	Total Population		Urban Population		Rural Farm Population		Rural Non-farm Population	
	Male	Female	Male	Female	Male	Female	Male	Female
1	2	3	4	5	6	7	8	9
0- 4	4.1	4.3						
5- 9	3.8	3.6						
10-14	- 4.3	- 4.4	7.9	9.5	- 9.7	-11.8	- 9.5	- 7.5
15-19	5.5	- 5.4	6.1	20.0	- 7.2	-19.6	-18.4	-10.2
20-24	-11.0	- 8.8	11.8	29.8	-19.7	-32.4	-24.1	-15.0
25-29	-14.6	-13.2	9.5	10.4	-28.2	-29.3	-20.2	-20.9
30-34	-13.7	-15.5	- 2.2	- 8.6	-21.4	-18.8	-18.2	-22.8
35-39	-10.4	-10.7	- 3.1	- 4.6	-14.7	-13.9	-15.7	-16.8
40-44	- 9.6	- 8.0	- 3.9	- 1.6	-12.7	-12.2	-14.1	-12.6
45-49	- 9.3	- 9.2	- 5.3	- 2.8	-11.2	-15.6	-12.8	-10.2
50-54	- 0.9	- 5.3	0.8	1.9	- 3.7	-15.8	1.2	- 1.5
55-59	-11.0	- 8.3	- 9.6	- 2.0	-15.6	-22.3	- 5.2	1.7
60-64	- 7.2	- 6.3	- 6.8	- 0.9	-15.3	-25.8	4.9	8.6
65-69	- 0.8	- 1.2	2.0	5.2	-15.8	-24.4	15.0	11.3
70-74	- 0.8	- 2.2	- 0.7	3.0	-15.7	-23.1	14.7	6.3
75-79	1.5	- 0.1	1.4	3.9	-12.2	-16.3	12.7	4.8
80-84	4.3	1.4	7.2	4.6	- 7.6	- 6.0	9.2	1.7
85-over	6.4	6.8	11.0	10.9	4.3	0.4	3.5	6.6

the male and the female populations (columns 2 and 3). The 20-24 group of the state as a whole shows a loss of 11 per cent for the males and 9 per cent for the females during the 1920-1930 decade; the 25-29 group lost 15 per cent of the males and 13 per cent of the females; the 30-34 group, 14 per cent of the males and 16 per cent of the females. About 145,000 persons between the ages of twenty and forty-nine were lost to the state as a whole. Losses were also found in the population above fifty, with the exception of the oldest groups of 80 and above, which seemingly increased. This gain is partly due to an increase in the foreign population in the older ages.²³ The total population (urban and rural) has lost every

23. An analysis of the foreign population indicated a decrease in the age groups of 30-59, and an increase in the older age groups.

seventeenth person, and that part of the population aged 20-49 years has lost every tenth person through emigration.

About 20 per cent of the male farm population and more than 30 per cent of the female farm population in the 20-24 group left their farms during the ten years from 1920 to 1930 (columns 6 and 7). The loss in the 25-29 group was 28 per cent for the male population and 29 per cent for the female population. Heavy losses took place also in the 30-34 group, which recorded a loss of 21 per cent for the males and about 19 per cent for the females. No gain was found for any age group in the rural population, except for the oldest one of 85 and above.

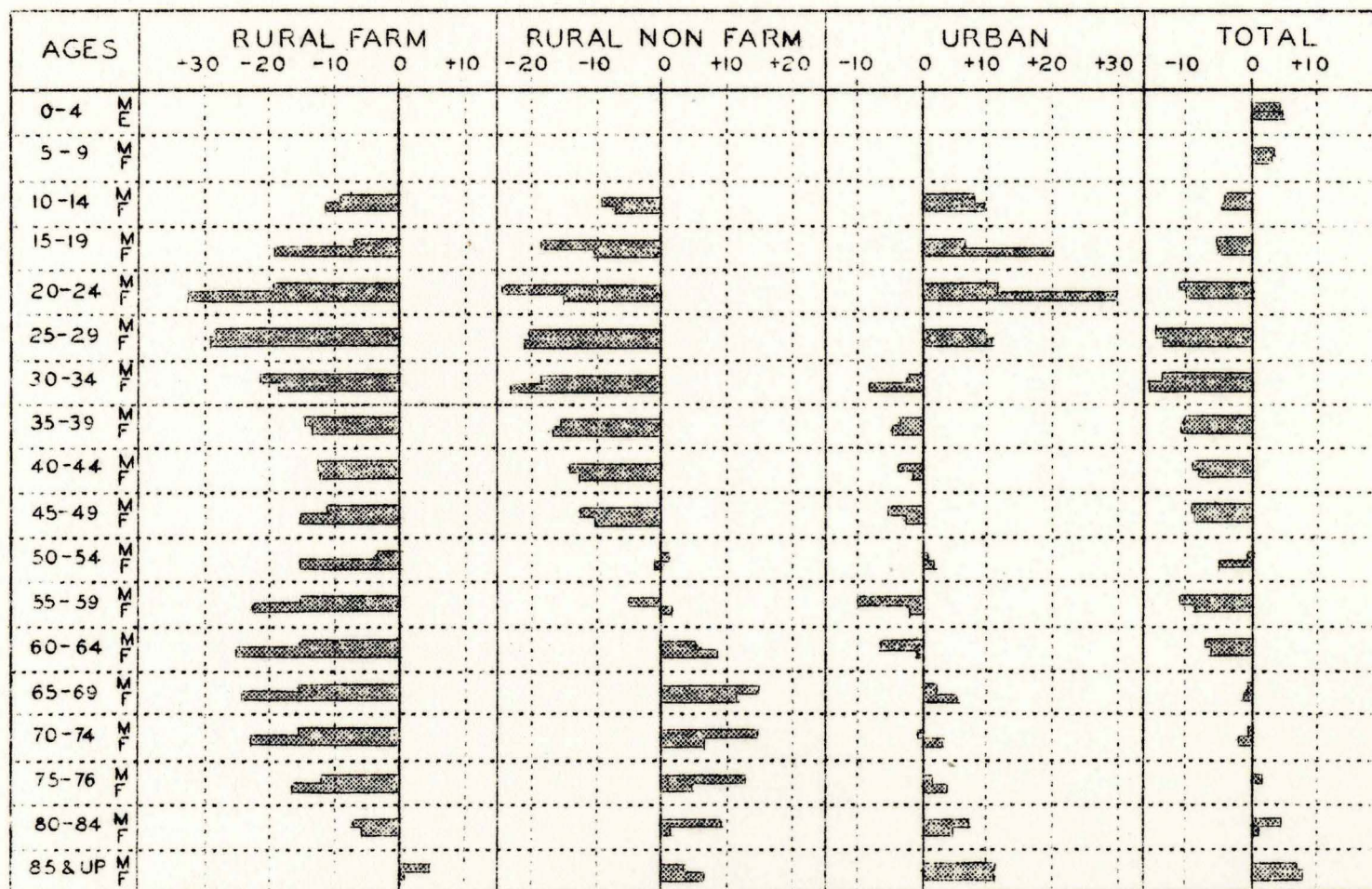
The losses in the farm population are much higher in the younger female age groups than in the corresponding male age groups. The females of the 10-14 group decreased by about 20 per cent as against a 7 per cent decrease for the males. The loss to the 20-24 group was 50 per cent larger for the females than for the males. The females leave the farms at a younger age than do the males.

The losses in the early age groups of the rural non-farm population do not differ greatly from those in the rural farm population. It is the male population, however, that makes up the great bulk of losses in the younger ages of the rural non-farm population; whereas, in the rural farm population the opposite is true (columns 8 and 9). However, the rural non-farm population shows increases in the age groups above 50, due apparently to an immigration of retired farmers.

On the average, every fifth person in the age group 20-44 in the rural (farm and non-farm) population left the state between 1920 and 1930.

The urban population shows great gains in the young age groups, especially in the female population (columns 4 and 5). These gains are unquestionably due to an immigration from the rural districts. The per cent of gain in the female population of the 15-19 group is more than three times as large as that of the male population. Above the age of

PER CENT OF GAINS(+) AND LOSSES(-) OF IOWA POPULATION THROUGH MIGRATION FOR DIFFERENT AGE GROUPS



IOWA STATE PLANNING BOARD

FIG. 14

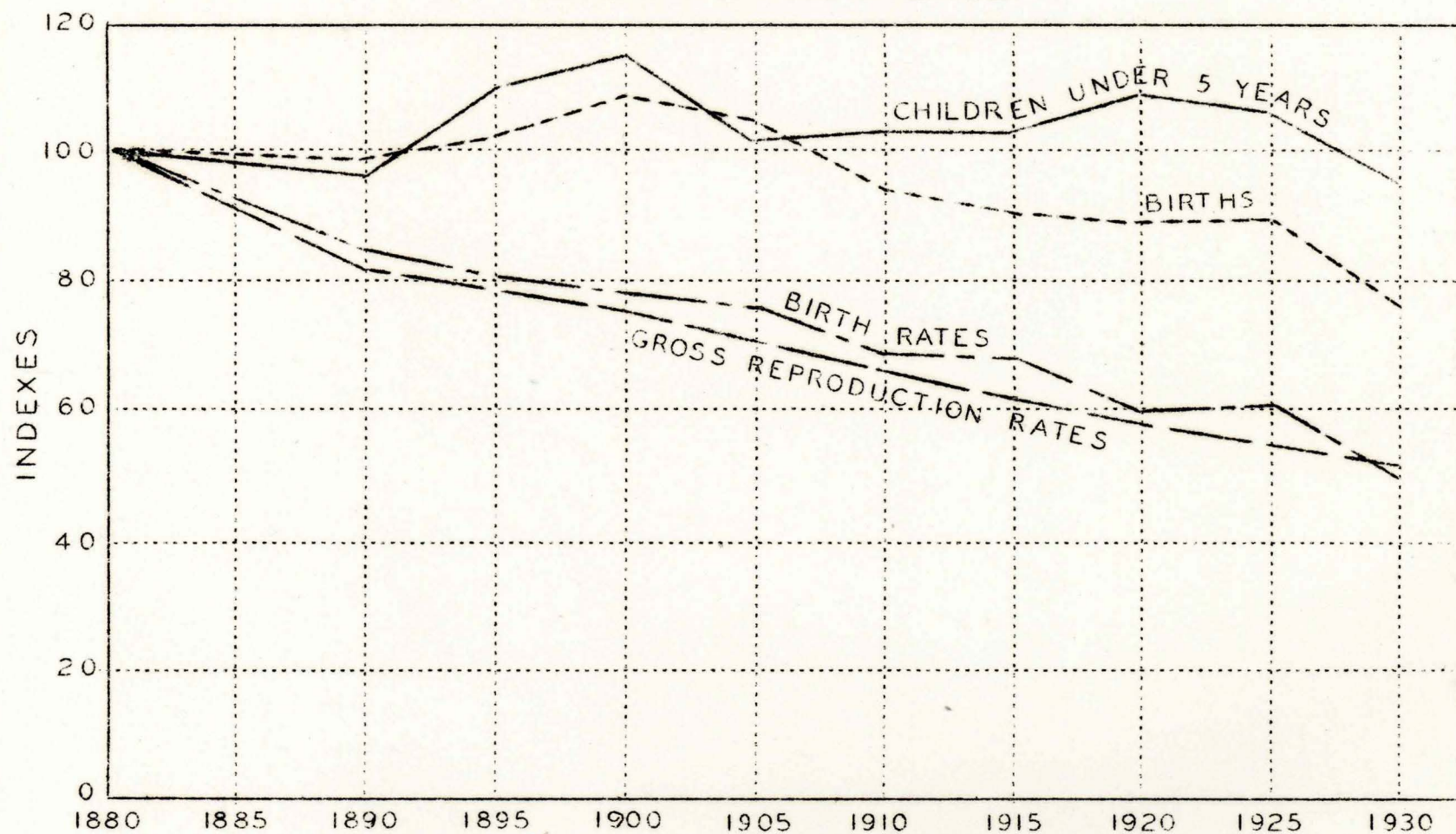
W. P. A.
PROJECT
2 9 2 9

thirty, however, the urban population shows a decrease. It seems that only a small part of the Iowa young male population goes to the cities within the state; most of them leave the state entirely. On the other hand, the greater part of the young female population goes, obviously, to Iowa cities, seemingly stays there a while, and then leaves the state.

There was an increase in the number of children in the Iowa population. Iowa counted more children in 1930 than were expected on the basis of births. This probably means, that, while a heavy emigration of young unmarried persons was going on, a small immigration composed mostly of families took place at the same time.

Evidently, it is the members of the 20-40 group, both males and females of the rural farm and non-farm population, who have been going out of Iowa.

TRENDS IN THE NUMBER OF CHILDREN UNDER 5 YEARS OF AGE,
BIRTHS, BIRTH RATES, AND GROSS REPRODUCTION RATES, 1880-1930;
1880 TAKEN AS A BASE



IOWA STATE PLANNING BOARD

FIG. 15

W. P. A.
PROJECT
2 9 2 9

PAST AND PRESENT BIRTHS, BIRTH RATES, AND FERTILITY RATES

In the general discussion of the Iowa population, the rapid decrease in its rate of growth and the shifts that have taken place in its age composition were pointed out. Presumably, these changes were brought about by migration and by alterations in the fertility and mortality rates of the population. The effects of migration were analyzed above. Inquiry is here made into the effects of the other factors with intent to define their probable influence on the future growth of the population. The immediate concern is, first, to examine births and birth rates; second to analyze death rates.

General Trend

Reliable statistics on births in Iowa for the years prior to 1924 are not available; the state was not included in the Birth Registration Area before that date. The data on births as reported by the Iowa State Department of Health for the period 1910-1924 (Table IX, Appendix) seem to be gross understatements, especially for the earlier years. Where adequate data on births are lacking, the enumerations of children as given by the Federal Census for every tenth year have been taken as a basis for computing the number of births.²⁴ This procedure of calculation is

24. See: W. S. Thompson and P. K. Welpton, Population Trends in the United States, Chapter VIII: "Births and Birth Rates."

particularly useful for Iowa since the Federal enumerations can be used in conjunction with the state enumerations, reducing thus the intercensal periods from ten to five years.²⁵ This additional information makes the

25. The Iowa State Censuses are taken midway between the dates of the Federal Censuses; namely, in years ending with 5.

basis of judgment more dependable.

As brought out in Table XVIII, the number of children in Iowa under five years of age has been declining, notwithstanding the general growth of the total population. Whereas, for the United States as a whole, the 1930 Census was the first one to show a decrease in the number of children under five years of age, in Iowa the number of children under five reached its maximum in 1900, when Iowa counted 262,000 children in this age group. There was a sharp decline between 1900 and 1910, partly due to the heavy emigration that occurred during that decade; there was a considerable increase between 1910 and 1920, which was more than offset by a heavy decline in the following decade. The number of children under five years of age

TABLE XVIII

NUMBER OF CHILDREN OF UNDER 1 AND UNDER 5, AND ESTIMATED BIRTHS
AND BIRTH RATES OF WHITE POPULATION, 1880-1930*

Year	Children		Estimated	
	Under 1 Year	Under 5 Years	Births	Birth Rates
1	2	3	4	5
1880	47,810	228,932	57,395	35.5
1890	47,833	222,560	56,809	29.9
1895	-----	252,493	58,720	28.7
1900	54,570	262,404	62,366	28.1
1905	-----	232,643	59,978	27.0
1910	47,924	234,755	54,151	24.5
1915	-----	236,260	52,502	24.0
1920	46,840	249,257	51,080	20.8
1925	-----	242,550	51,938	19.7
1930	41,842	218,886	43,585	17.7

* The births were computed on the basis of the number of children under 1 year and under 5 years of age (columns 2 and 3), as given in the Federal and State Censuses. The Federal Census data were used for the even years, and those of the State Census for the odd years. The Infant Mortality rates, as given by W. S. Thompson and P. K. Whelpton in "Population Trends in the United States", Table 65, p. 236, were used in these calculations for all years except 1930, to which year the Iowa Life Table was applied. The birth rates were obtained through dividing column 4 by the corresponding census populations. The reported birth rate for 1930 was 17.3 against the estimated birth rate of 17.7; evidently, the approximations are sufficiently reliable.

in 1930 constituted about 85 per cent of the number in 1900, and about 88 per cent of the number in 1920. There was, consequently, a drop of about 17 per cent in the number of children from 1900 to 1930, and a decline of 12 per cent from 1920 to 1930, while the total population in 1930 was 11 per cent greater than in 1900 and 3 per cent greater than in 1920.

In order to find the number of births, the number of children was increased by their corresponding mortality rates.²⁶ For the even numbered

26. See: Notes to Table XVIII.

years, the number of children under one year of age was used; whereas, for the odd years, the number under five was used since the State Census does not enumerate separately the children under one year of age. These resultant estimates of births are given in Table XVIII, column 4.

The number of births in 1930 was 24 per cent smaller than it was half a century ago and 15 per cent smaller than it was ten years ago. The decline in the number of births has been apparently constant since 1900.

The crude birth rate has been consistently declining since 1880, (Table XVIII, column 5, Figure 15). In 1880, the estimated birth rate was 35.5; in 1900, when the greatest number of births occurred, it was 28.1, a decline of 21 per cent below the rate of 1880; in 1930 it had fallen to 17.7²⁷, a drop of 50 per cent, when compared with 1880. Evidently, the

27. The estimated crude birth rate is taken here, instead of the reported one (17.3), for the purpose of consistency in comparison with the other.

trend in birth rates has been sharply downward.

Is this decline in the birth rate due to changes in the age composition of the population, or to a drop in its fertility, or to both, since the birth rate is a function of both? To find the separate effects of these two factors on the changes in the birth rate, the so-called specific fertilities were computed.

Specific Fertility Rates

It has been shown above²⁸ that the crude birth rate is very much

28. See: Introduction

affected by the age composition of the population. If, in a population, the percentage of women of child-bearing age is large, it was argued, the birth rate is likely to be high even if fertility is low, whereas a population with a comparatively smaller percentage of women in the child-bearing age will show a low birth rate although the fertility may be high. It is essential to compute an index which will reflect fertility only, free from the influence of the age factors. This is accomplished by the use of the so-called specific fertility rates, in Kuczynski's terminology, or maternity frequencies, in Dublin and Lotka's terminology²⁹, relating

29. See: Robert R. Kuczynski, The Balance of Births and Deaths, Volume I, Macmillan Company, New York, 1928, pp. 16-39; by the same author: Fertility and Reproduction, Falcon Press, 1932; also, L. I. Dublin and A. J. Lotka, op. cit.

the number of children born by mothers of a specific age to the total female population of that age. These are generally computed on a quinquennial basis.

The "Birth, Stillbirth and Infant Mortality Statistics," published by the United States Bureau of the Census, provide a classification of births by age of mother.³⁰ Thus, in 1929, 13 sons and 8 daughters were

30. See Table XIX and notes there.

born to mothers of the age group 10-14; 2,091 sons and 2,038 daughters to the age group 15-19, and so on. Each number of births was divided by the female population of its corresponding age group and the result multiplied by 100,000, getting thus the number of sons and daughters born per 100,000 females of that specific age group. The specific fertility for the quinquennial age group 10-14 was found to be 11 sons and 7 daughters and so on. The highest specific fertilities are those of the age group 20-29, so that changes, however slight, in the proportion of the female population falling within this age group produce noticeable changes in the birth rate. By this procedure the computation of the fertility rates is reduced to one basis, and the age composition factors are thus ruled out.

The total fertility rates of the Iowa population in 1929 were computed to be 116,325 sons and 110,580 daughters. This means that according to the existing specific fertility rates of 1929, 100,000 females, if they all survived to the age of fifty-five would give birth throughout their child-bearing age³¹ to 116,325 sons and 110,580 daughters. The ratio of

31. The child-bearing age is usually assumed to cover the years from ten to fifty-four.

TABLE XIX

QUINQUENNIAL FERTILITY RATES OF IOWA POPULATION, 1929*

Age Interval	Female Population in 1929	Children Born in 1929		Maternity Frequencies m(a) per 100,000 Females	
		Sons	Daughters	Sons	Daughters
1	2	3	4	5=3:2	6=4:2
10-14	114,954	13	8	11	7
15-19	109,414	2,091	2,038	1,911	1,863
20-24	100,086	6,064	5,700	6,059	5,695
25-29	90,082	5,662	5,338	6,285	5,926
30-34	86,587	4,007	3,842	4,628	4,437
35-39	86,193	2,585	2,546	2,999	2,954
40-44	76,518	978	847	1,278	1,107
45-49	69,038	65	86	94	125
50-54	60,582	<u>-----</u>	<u>1</u>	<u>-----</u>	<u>2</u>
				23,265	22,116
				x5	x5
TOTAL		21,465	20,406	116,325	110,580

Ratio: $\frac{\text{Sons}}{\text{Daughters}} = 105.2$

*See following page for explanation.

*Explanation of preceding table

Column 1 shows the age groups to which the items in the other columns are related. Column 2 gives the numbers of females in 1929 at different age groups of the child-bearing period, namely from ten to fifty-four. These were interpolated on an arithmetic basis from the 1930 Census for nine months back, as the birth statistics were reported for July (1929), and the 1930 Census was taken in April (1930). Columns 3 and 4 show the number of male and female births by age of mothers; thus 2,091 sons and 2,038 daughters were born to mothers of the 15-19 group. The data were adapted from Birth, Stillbirth and Infant Mortality Statistics for 1929, p. 187. The data as given in columns 3 and 4 differ slightly from those given in the Birth Statistics as the unknown births were distributed proportionally among the different groups.

Every number of births of a specific age group is divided by its corresponding total number of females and the resultant multiplied by 100,000. According to the statistics, 6,064 sons and 5,700 daughters were born to the 20-24 group which counted 100,086 females, consequently 6,059 sons and 5,695 daughters are born per 100,000 females of that group ($6,064/100,086 \times 100,000$).

These are the specific fertility rates, as tabulated in columns 5 and 6. The sum of all the separate specific fertilities makes up the so-called total fertility or gross reproduction rate. Accordingly, 100,000 females who start life together, providing no one of them dies before reaching fifty-five years, will give birth on the average to 11 sons and 7 daughters each year when they will be in the age group 10-14; they will bear on the average every year 1,911 sons and 1,863 daughters when they will pass the 15-19 period, and so on. Hence, they will give birth, according to these specific fertility rates, to 116,325 sons and 110,580 daughters throughout their child-bearing period.

male to female births was thus found to be 105.2. It is, however, the number of potential mothers that is of present interest. According to this calculation, 100,000 mothers starting life together are replaced within a generation by 110,580 potential mothers (Table XIX, column 6) provided none of the present mothers dies before reaching or while passing through the child-bearing age. The totality of these fertility rates is known as the gross reproduction rates.

But in reality, of the 100,000 females who are born, only 93,817 reach the age of 12.5 years, and their number is reduced to 93,154 at the age of 17.5 years, 92,177 at 22.5 years, etc.³² Obviously, if 100,000

32. See Table XX, column 3, also Table XXX, column 3.

females give birth to 1,863 daughters at the age of 12.5 years, then the 93,154 females that remain of the 100,000 who started life together bear 1,735 daughters ($1,863 \times .93817$); the 92,177 females at 22.5 years bear 5,249 daughters ($5,695 \times .92177$), and so on.

The net reproductive rate (R_0) of the Iowa population, which is the total of column 4, Table XX, was found to be 100,095 in 1929. At such a rate, one thousand present mothers are replaced by 1,001 mothers within a generation (about 28.4 years). Clearly, such a population is just slightly more than reproducing itself--even though its births at present greatly surpass its deaths. It may be regarded as stationary, without potential increase, notwithstanding the fact that the "crude" rate of natural increase of Iowa for 1929 showed an excess of 6.7--a birth rate of 17.1 against a death rate of 10.4. This present increase is a mere effect of the age composition which will disappear when the age composition has become stable.

Birth Rate of Zero Rate of Natural Increase

It is obvious that in order for a population to remain stationary every person of the present generation has to be replaced by one in the future, or, to say it differently, the net reproduction rate (R_0) has to be 1,000. The Iowa net reproduction rate was computed as 1,001. Iowa's population consequently has about reached the equilibrium point of a stationary population. Reversing the process, let us find that birth rate which, at the age composition of the population in 1930, would keep our population at a standstill.

It is clear that if at the existing specific fertilities or maternity frequencies (ma's) and the prevailing mortality rates, the R_0 is 1,001, then by reducing every maternity frequency by the ratio 1,000:1,001, namely multiplying it by 0.999, the equilibrium maternity frequencies may be obtained, Table XXI, column 4. By multiplying each item in column 4 by the corresponding item in column 2 and summing up these items, it was

TABLE XX

COMPUTATION OF TRUE RATE OF NATURAL INCREASE OF IOWA POPULATION, 1929*

Age Interval	Maternity frequency $m(a)$ (Daughters only)	Survival factors at 12.5, 17.5 etc.	R_0 Zero Moment $\sum m(a) l_a$	R_1 First Moment $\sum am(a) l_a$	R_2 Second Moment $\sum a^2 m(a) l_a$
1	2	3	4 = (2x3)	5	6
10-14	7	0.93817	7	87.5	1,093.7
15-19	1,863	0.93154	1,735	30,362.5	531,343.8
20-24	5,695	0.92177	5,249	118,102.5	2,657,306.2
25-29	5,926	0.09051	5,390	148,225.0	4,076,187.6
30-34	4,437	0.89593	3,975	129,187.5	4,198,593.7
35-39	2,954	0.88076	2,602	97,575.0	3,659,062.6
40-44	1,107	0.86160	954	40,545.0	1,723,162.5
45-49	125	0.83713	105	4,987.5	236,906.3
50-54	2	0.80325	2	105.0	5,512.5
	22,116		20,019	569,177.5	17,089,169.0
	x5		x5	x5	x5
	110,580		100,095	2,845,887.5	85,445,845.0
			R_0	R_1	R_2

Data:

$$\alpha = \frac{R_1}{R_0} = 28.43, \alpha^2 = 808.26$$

$$\beta = \alpha^2 \frac{-R_2}{R_0} = 808.26 - 853.65 = -45.39$$

$$\log_e R_0 = 0.000951889$$

The equation: $\frac{1}{2}\beta r^2 + \alpha r - \log_e R_0 = 0$: Substituting the values of α , β and $\log_e R_0$ in
: the original equation, we get:

: $22.69r^2 - 28.43r + 0.000951889 = 0;$

: $r = \frac{28.43 - \sqrt{808.26 - .0864}}{45.39} = 0.00003525$

: $r = .03525 \text{ per } 1000$

*Reproduced from: Bernard D. Karpinos, "A Stationary Population," Human Biology, December, 1935. The true natural increase, denoted by "r", which is the future constant rate of increase after the present factors that are responsible for the disturbed age-composition will wear off, is computed on the basis of a formula worked out by Alfred J. Lotka (see: "On the True Rate of Natural Increase," by Louis I. Dublin and Alfred J. Lotka, Journal of the American Statistical Association, 1925, 305-339. See also R. R. Kuczynski, Fertility and Reproduction, Methods of Measuring the Balance of Births and Deaths, Falcon Press, New York, 1932, 47-65, where Lotka's formula is reproduced and supplemented with explanatory remarks.)

The proved formula is: $\frac{1}{2}\beta r^2 + \alpha r - \log_e R_0 = 0$, (1)

where $\alpha = R_1/R_0$ (columns 6 and 7); R_0 (the zero moment) is the $\sum m(a)l_a$, namely, the total net reproduction rate; R_1 - the first moment (column 7) - is the summation of all the $m(a)l_a$ weighted by their corresponding "a's", namely the number of years at the center of the age-groups; the $m(a)l_a$ at the age-group 10-14, for instance, is weighted by 12.5; the age-group 15-19 by 17.5, etc; R_1 is thus $\sum am(a)l_a$; R_2 - the second moment (column 8) - is the summation of all the $m(a)l_a$ weighted by their corresponding "a's". In this particular case

$$\alpha = 28.43; \alpha^2 = 808.26 \quad (2)$$

$$\beta = \alpha^2 - R_2/R_0 = -45.39 \quad (3)$$

$$\log_e R_0 = \log_e (1.00095) = 0.0009519$$

Substituting the corresponding numerical values for α , β and $\log_e R_0$, we obtain: $\frac{1}{2}\beta r^2 + \alpha r - \log_e R_0 = 22.69r^2 - 28.43r + .000952 = 0$

$$r = .00003525$$

This "r" differs from the "r" computed by the author in his M.A. Thesis (Bernard D. Karpinos, The Natural Increase of the Population of Iowa When Corrected for Age Distribution, M.A. Thesis, State University of Iowa, August, 1932), due to the present lower mortality rates as compared with those used in the M.A. Thesis.

found that, at the existing age composition of 1930, every 100,000 females should give birth yearly to 3,457 children, if the population is to be stationary. The corresponding birth rate of such a stationary population will be 17.1 (3,486 divided by 203.4, as the ratio of males to females in 1930 population was 103.4). The birth statistics show a birth rate of 17.1 in 1929 and 17.3 in 1930; palpably the Iowa population had about reached its equilibrium point in 1930.³³

-
33. For more detailed explanation of the method used in this computation, the reader is referred to Louis I. Dublin and Alfred J. Lotka, "The True Rate of Natural Increase of the Population of the United States," Metron, Table VII, (8), pp. 116-117. Also: Bernard D. Karpinos, op. cit., Human Biology.
-

Past Fertility Rates

Let us assume that the Iowa population has been reproducing itself at successive census years since 1880 at the specific fertility rates of 1929, and on this basis let us calculate the corresponding birth rates for these years. Unless there have been changes in fertility, the resulting birth rates should be approximately the same as the estimated actual rates, for the actual age compositions were used.

Calculated in this way, the birth rate for the state as a whole in 1880 would have been 17.3, the same as in 1930; in 1890 it would have been 17.9; the highest rate would have occurred in 1910, when the age factors were most favorable for a high birth rate.³⁴

-
34. The same method, which was applied in computing the birth rate of the zero rate of increase (Table XXI) was used here; namely, the specific fertility rates of 1929 were multiplied by the corresponding age compositions of the different decades.
-

The actual birth rate for 1880, however, was estimated as 35.5, twice as large as the one expected if the specific fertility rates of 1929 were applicable to the age composition of the 1880 population. Evidently, the gross reproduction rate of the Iowa population in 1880 was twice as high as in 1930. The gross reproduction rates since 1880 are given in Table XXII, column 7, and Figure 16.

The trend of the gross reproduction rates has been uninterruptedly downward since 1880, closely paralleling the downward trend of the birth rates, (compare columns 3 and 6, Table XXII; see also, figures 15 and 16). This indicates that the decline in the birth rate during this period was not due primarily to changes in the age composition of the population, but to a decreasing fertility. From 1880 to 1930, then, the birth rates in Iowa convey a fairly true picture of the changes in the fertility of the

TABLE XXI

COMPUTATION OF BIRTH RATE IN IOWA GIVING ZERO RATE OF NATURAL INCREASE
WITH AGE DISTRIBUTION AS IN 1930 CENSUS

Age Group	Age Distribution of Females (1930 Census)	Maternity Frequency m(a) Per 100,000 Females	Maternity Frequency Reduced Proportionally to Make Ratio of Successive Generations Equal to Unity (3) x 0.999	Product (2) x (4)
1	2	3	4	5
10-14	9.57	18.1	18	1.7
15-19	9.10	3,774	3,770	343.1
20-24	8.33	11,754	11,742	978.1
25-29	7.50	12,211	12,199	919.5
30-34	7.21	9,065	9,056	652.9
35-39	7.17	5,953	5,947	426.4
40-44	6.37	2,385	2,383	151.8
45-49	5.74	219	219	12.6
50-54	<u>5.04</u>	<u>2</u>	<u>2</u>	<u>0.1</u>
TOTAL	66.03	45,381	45,336	3,486.2
		<u>x5</u>	<u>x5</u>	
		226,905	226,680	

Birth rate for Zero Natural Increase: 17.1

TABLE XXII

ESTIMATED BIRTH RATES OF WHITE POPULATION FOR 1880-1930; COMPUTED BIRTH RATES OF THE SAME POPULATIONS ON THE BASIS OF 1929 SPECIFIC FERTILITIES; THEIR GROSS REPRODUCTION RATES

Year	Birth Rates*	Indexes of the birth rates with 1930 as a basis	Computed birth rates at 1929 specific fertilities**	Computed and actual birth rates compared	Gross reproduction rates 1929 = 100	
1	2	3	4	5 =(2:4)	Indexes 6	Actual 7
1880	35.5	201	17.3	203	197	2,179
1890	29.9	169	17.9	167	162	1,792
1895	28.7	162	-----	-----	-----	-----
1900	28.1	159	18.1	155	150	1,659
1905	27.0	153	-----	-----	-----	-----
1910	24.5	138	18.2	135	131	1,449
1915	24.0	136	-----	-----	-----	-----
1920	20.8	117	18.1	115	112	1,239
1925	19.7	111	-----	-----	-----	-----
1930	17.7	100	17.3	103	100	1,106

* Taken from Table XVIII, column 5

** Calculated on the basis of 1929 specific fertilities. These rates were not computed for the odd numbered years, as the State Census does not give the proper age distributions.

IOWA GROSS REPRODUCTION RATES

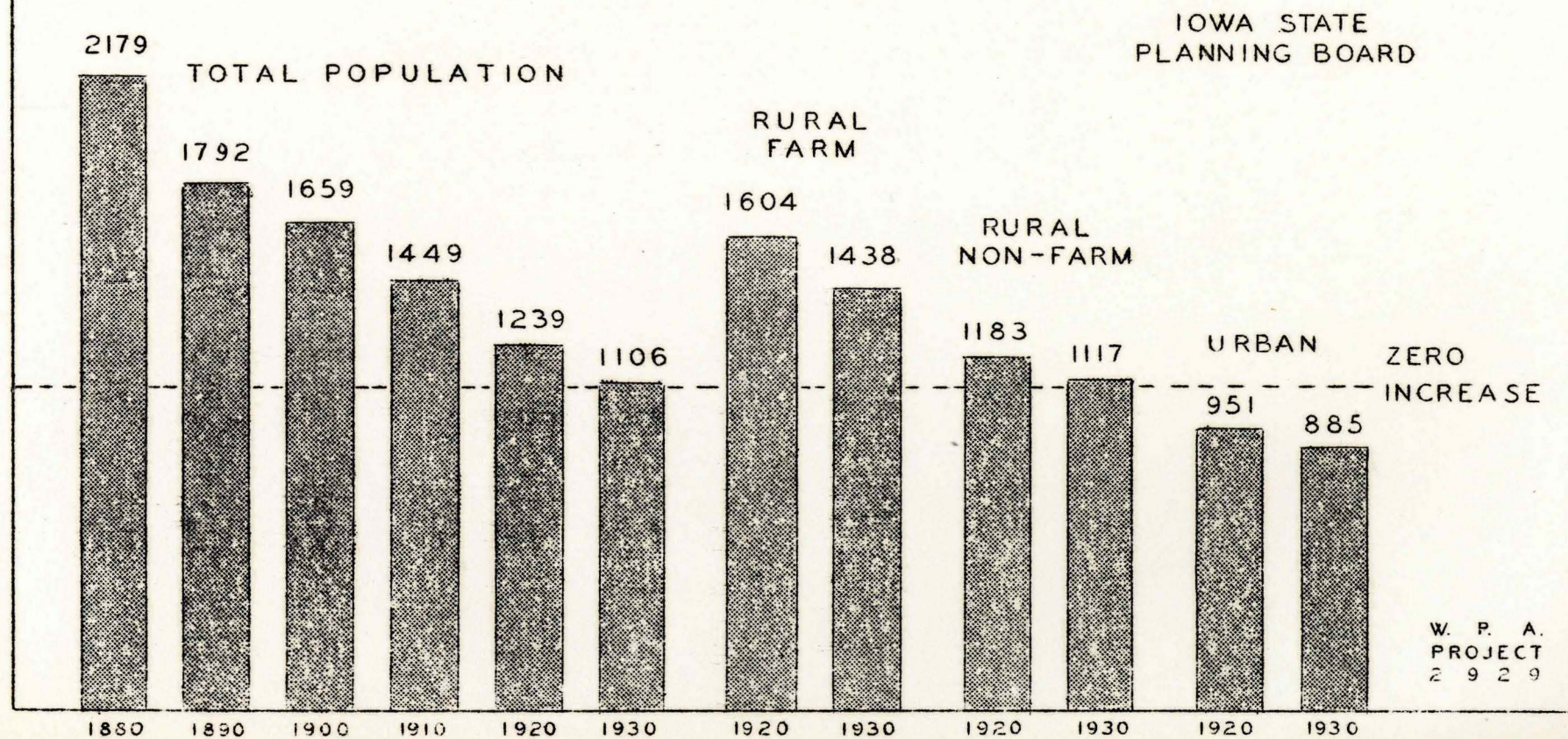


FIG. 16

state's population. In the future, however, the age factors will become more and more significant, affecting correspondingly the birth rates, even if no change in specific fertilities takes place.

Reproduction Rates of the Rural and Urban Population

Better insight into what has been going on in the population of the state may result from an examination of the so-called differentials in the fertility rates; that is, the separate fertility rates for different divisions of the population. By means of the same method that was used for the population of the state as a whole, the differentials for the urban, rural farm, and rural non-farm populations were calculated.³⁵ The

35. No separate analysis of the foreign population was undertaken, as this population constitutes a negligible percentage of the total.

results are given in Table XXIII.

The gross reproduction rate of the urban population in 1920 was found to have been 951. This rate is much below the point necessary to maintain this population. In 1930 the rate of the urban population had dropped to 885.³⁶ At the 1920 rate, the population would ultimately

36. One is reminded here that the gross reproduction rate of 1,106 for the state as a whole is just sufficient to keep the population stationary; a lower rate means decrease.

decrease by 14 per cent each generation (about 28.4 years); at the 1930 rate, by 20 per cent each generation.

The four largest cities in Iowa (Cedar Rapids, Davenport, Des Moines, and Sioux City) had in 1920 and 1930 gross reproduction rates of 874 and 829, respectively. Stable populations with such rates decrease by 21 per cent and 25 per cent, respectively, each generation.

The highest gross reproduction rate was that of the rural farm population. It was 1,604 in 1920, and 1,438 in 1930. Stable populations with such rates increase approximately 45 and 30 per cent, respectively, in a generation.

The gross reproduction rate of the rural non-farm population was 1,183 in 1920, and 1,117 in 1930. At the first rate a stable population increases by 7 per cent each generation. In 1930 this population was only slightly above the stationary point.

Obviously, it is the rural farm population that keeps the total population of the state from decreasing.

TABLE XXIII

ESTIMATED BIRTH RATES OF TOTAL, URBAN, RURAL FARM, AND RURAL NON-FARM POPULATIONS;
COMPUTED BIRTH RATES OF THE SAME GROUPS ON THE BASIS OF 1929 SPECIFIC FERTILITIES;
THEIR GROSS REPRODUCTION RATES, 1920-1930*

	Estimated Birth Rates		Computed Birth Rates at 1929 Specific Fertilities		Gross Reproduction Rates 1930 =100 (for whole state) Indexes Actual			
	<u>1920</u>	<u>1930</u>	<u>1920</u>	<u>1930</u>	<u>1920</u>	<u>1930</u>	<u>1920</u>	<u>1930</u>
	1	2	3	4	5	6	7	8
Total	20.8	17.7	18.1	17.3	112	100	1,239	1,106
Urban (Cities above 2,500)	17.2	15.0	19.4	18.3	86	80	951	885
Four Cities (above 50,000)	17.5	15.0	21.5	19.5	79	75	874	829
Rural (Total: Farm and Non-farm)	23.2	19.7	17.3	16.1	130	119	1,438	1,316
Rural Farm	26.5	22.1	17.8	16.5	145	130	1,604	1,438
Rural Non-farm	18.1	16.0	16.4	15.4	107	101	1,183	1,117

* The birth rates of urban population as reported by the Bureau of the Census are much higher than those estimated on the basis of the number of children of under one year of age, for births are tabulated according to the place of occurrence. The medical and hospital facilities in the urban centers make the birth rates higher. The opposite is true of the rural birth rates.

While between 1920 and 1930 the gross reproduction rate of the urban population decreased approximately 7 per cent; of the city population, 5 per cent during the same period, and of the rural non-farm group, 6.5 per cent, that of the farm group decreased approximately 10 per cent. The gross reproduction rate of the rural farm population has a steeper downward trend.

Number of Children in Order of Birth

The downward trend in fertility rates is revealed, also, by a slightly different analysis,--an examination of the number of children in order of birth. Unfortunately this analysis could be carried only as far back as 1924, the year when Iowa was first included in the Registration Area. As shown in Table XXIV and Figure 17, "Birth Changes in Iowa," the downward trend in the number of births of second, third, and fourth children is much sharper than in the number of births of first children.

In examining the births by age of mother (Table XXV), the greatest decline was disclosed in the number of children born to mothers 25-29 years of age, the age period of highest specific fertility.

The effects of these changes on the future growth of the population are discussed later.

TABLE XXIV

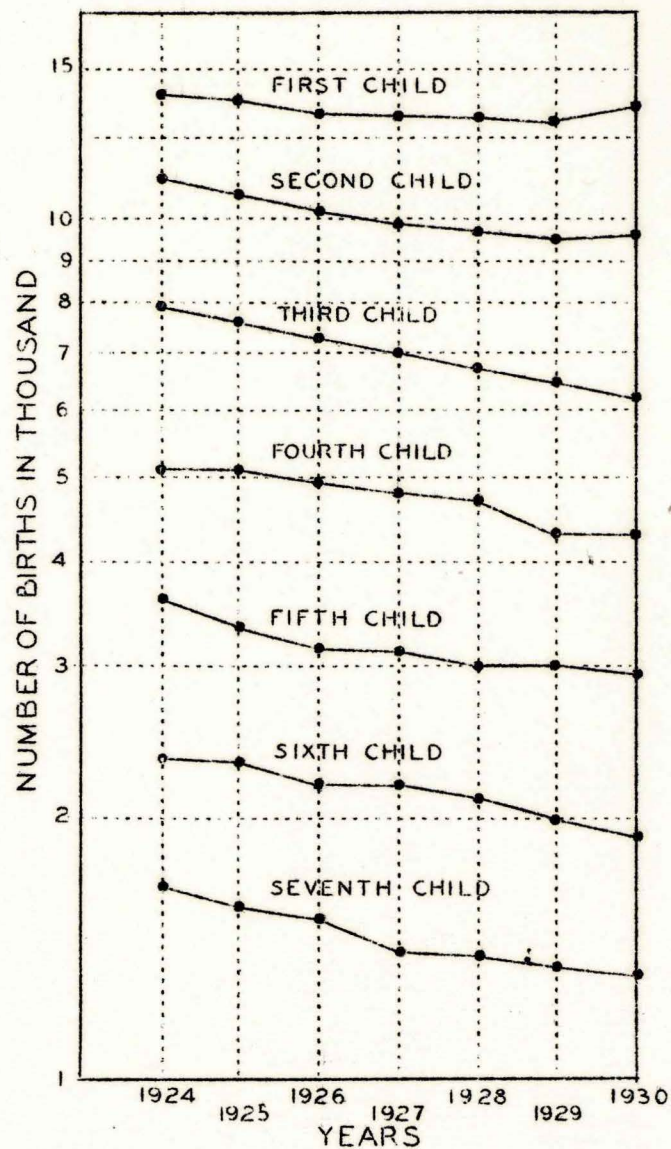
BIRTHS WITH NUMBER OF CHILD IN ORDER OF BIRTH, COMPARATIVE PERCENTAGES,
1924 - Base*

Children

Year	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth	Total
1	2	3	4	5	6	7	8	9	10	11	12
1924	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1925	98.5	96.0	95.5	100.1	92.4	98.9	94.3	102.6	98.2	94.8	97.1
1926	95.0	91.9	92.2	95.4	87.6	92.9	91.3	92.5	93.3	91.2	92.9
1927	94.4	89.2	87.9	92.9	87.9	93.4	84.1	95.0	94.9	96.6	90.9
1928	93.7	87.0	85.1	90.3	83.3	89.6	82.8	86.5	86.9	86.0	88.2
1929	92.4	84.3	82.1	83.2	83.2	84.8	81.0	84.0	87.7	86.0	85.6
1930	97.7	86.3	79.6	83.4	82.4	83.6	80.0	81.5	88.8	76.4	86.9

* Based on data published in the Birth, Stillbirth, and Infant Mortality Statistics.

BIRTH CHANGES IN IOWA WITH THE NUMBER OF CHILD IN ORDER OF BIRTH 1924-1930



IOWA STATE PLANNING BOARD

FIG. 17

W. P. A.
PROJECT
2929

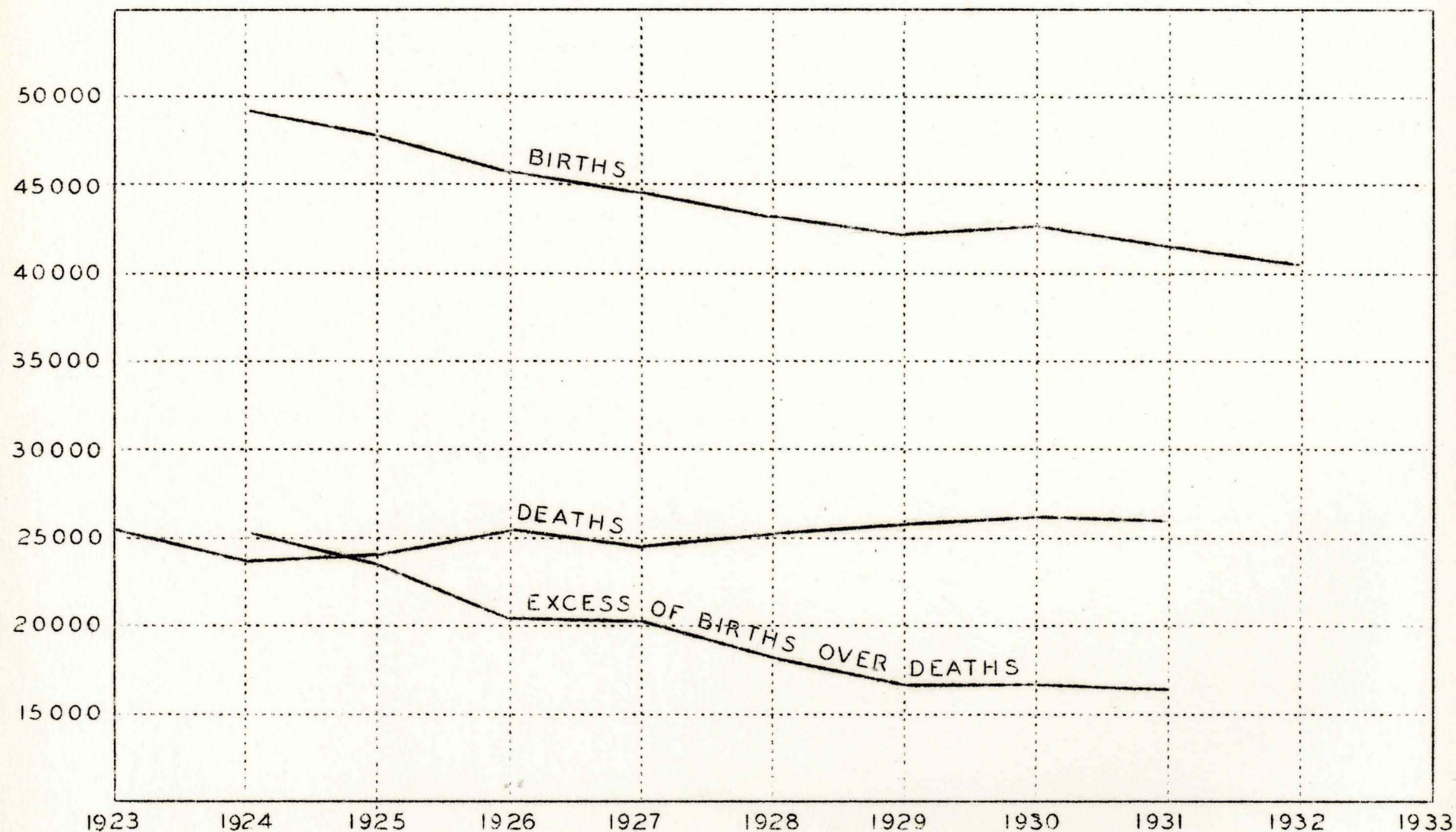
TABLE XXV

BIRTHS (EXCLUSIVE OF STILLBIRTHS) BY AGE OF MOTHER, YEARS 1924-1930,
COMPARED WITH 1924 AS BASE*

Years	Age of Mother							Total
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
1	2	3	4	5	6	7	8	9
1924	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1925	99.8	96.0	96.4	98.2	98.2	97.6	110.0	97.1
1926	93.9	91.7	91.2	94.6	94.3	95.7	115.3	92.9
1927	94.1	88.9	89.4	93.0	94.2	94.7	103.1	90.9
1928	92.1	89.2	85.8	88.8	89.0	89.5	106.7	93.3
1929	93.5	86.4	82.4	82.8	88.6	91.0	93.3	85.6
1930	94.5	89.6	82.9	84.6	86.8	84.6	97.5	86.9

* Based on data published in the Birth, Stillbirth, and Infant Mortality Statistics.

BIRTHS AND DEATHS IN IOWA, 1923-1932



IOWA STATE PLANNING BOARD

FIG. 18

W P A.
PROJECT
2 9 2 9

DEATHS, DEATH RATES, INFANT MORTALITY RATES,
AND EXPECTATION OF LIFE

The number of deaths and the death rates in Iowa have remained about constant during the last few years, in spite of an increasing and aging population. The number of deaths oscillated around 25,000, and the death rate, around 10.0 per thousand. Such constancy in the number of deaths and death rates, in spite of the fact that the population was growing older and should, therefore, have more deaths and higher death rates, suggests that mortality rates in Iowa have actually been decreasing. The decline in the mortality of infants has been presumably a large item

TABLE XXVI

DEATHS AND CRUDE DEATH RATES IN IOWA AND
THE UNITED STATES, SINCE 1923*

Years	Iowa Deaths	Iowa Death Rates	United States Death Rates
1	2	3	4
1923	25,378	10.3	11.9
1924	23,774	9.8	11.3
1925	24,294	10.0	11.3
1926	25,466	10.4	11.8
1927	24,532	10.0	10.9
1928	25,315	10.3	11.5
1929	25,681	10.4	11.3
1930	26,228	10.6	10.8
1931	25,681	10.4	11.1

* Taken from Table IX, Appendix.

in keeping the number of deaths and the death rates constant. In 1924, the first year in which infant mortality was recorded for Iowa, the number of deaths of children under one year of age was 54.6 for each 1,000 live births. By 1932, infant mortality had declined to 47 for each 1,000 live births. The decline was gradual, with the exception of 1925 and 1926.

Iowa's infant mortality has been much smaller than that of the United States. Table XXVII allows a comparison of the rates for Iowa with those of the United States. As compared with other states, Iowa ranked sixth in 1929, and tenth in 1930.³⁷

³⁷ The State of Washington reported the lowest infant mortality rates-- 46.8 in 1929, and 46.0 in 1930.

This decline in the infant mortality rate lengthened the total average expectation of life. According to the Life Table of 1930, the expectation of life (e^0_x) at birth for males in Iowa was 63.0 years and for females 65.9 years, a high expectation of life.³⁸

³⁸ The corresponding e^0_x for neighboring states were: Wisconsin, 61.5 and 64.6; Michigan, 59.8 and 62.8; Indiana, 60.0 and 62.8; Ohio 59.8 and 63.0; Illinois, 59.0 and 64.6 years for males and females, respectively. (Taken from "Statistical Bulletin", Metropolitan Life Insurance Company, June, 1934, p. 7)

Seemingly, the greatest lengthening of the expectation of life occurred in the younger age groups. The expectation of life in the older age groups did not increase as much, as can easily be seen when the Life Table of 1930 is compared with the available Life Tables of 1920.

The future trends of the deaths and death rates are discussed later.

TABLE XXVII

INFANT MORTALITY OF WHITE POPULATION IN IOWA AND THE UNITED STATES
(Deaths under 1 year of age per 1,000 live births)*

Year	I o w a			U n i t e d S t a t e s		
	Total	Urban	Rural	Total	Urban	Rural
1	2	3	4	5	6	7
1924	54.6	65.6	50.4	66.8	68.7	64.7
1925	55.4	68.7	50.0	68.3	69.4	67.2
1926	58.3	71.1	52.9	70.0	70.5	69.4
1927	54.9	66.0	50.2	60.6	61.0	60.3
1928	52.7	67.1	46.5	64.0	64.6	63.4
1929	52.4	63.2	47.5	63.2	61.9	64.4
1930	53.2	61.5	49.1	59.6	58.4	60.9
1931**	49.0			61.9	61.4	62.3
1932	47.0			57.9	57.1	58.7

* Adopted from Birth, Stillbirth and Infant Mortality Statistics. Urban in the Birth Statistics includes cities of 10,000 and over, distinguished from the Census classification that includes in "urban", cities of 2,500 and above.

**Provisional report for 1931 and 1932.

TABLE XXVIII A*

Complete Life Table for White Males (Including Mexicans Classified
as Other Races) for Iowa, Based on 1929-1931
Population Statistics

Age	q_x	l_x	e^o_x	Age	q_x	l_x	e^o_x
0	.05290	100000	63.04				
1	.00682	94710	65.54				
2	.00460	94064	64.99	32	328	87427	38.71
3	.00318	93631	64.28	33	336	87140	37.83
4	.00226	93335	63.49	34	346	86847	36.96
5	.183	93122	62.63	35	359	86547	36.09
6	.169	92952	61.74	36	376	86236	35.22
7	.00164	92795	60.85	37	397	85912	34.35
8	.147	92643	59.95	38	422	85571	33.48
9	.140	92507	59.03	39	451	85210	32.62
10	.141	92377	58.12	40	483	84826	31.77
11	.148	92247	57.20	41	517	84416	30.92
12	.159	92110	56.28	42	550	81980	30.08
13	.173	91964	55.37	43	582	83518	29.24
14	.188	91805	54.46	44	614	83032	28.41
15	.204	91632	53.57	45	648	82522	27.58
16	.219	91445	52.67	46	684	83987	26.76
17	.234	91245	51.79	47	725	81426	25.94
18	.246	91031	50.91	48	772	80836	25.12
19	.256	90807	50.03	49	824	80212	24.32
20	.265	90575	49.16	50	884	79551	23.51
21	.272	90335	48.29	51	952	78848	22.72
22	.279	90089	47.42	52	1027	78097	21.93
23	.284	89838	46.55	53	1112	77295	21.15
24	.289	89583	45.68	54	1206	76435	20.39
25	.293	89324	44.81	55	1310	75513	19.63
26	.297	89062	43.94	56	1425	74524	18.88
27	.301	88797	43.07	57	1549	73462	18.15
28	.305	88530	42.20	58	1686	72324	17.43
29	.310	88260	41.33	59	1834	71105	16.72
30	.315	87986	40.46	60	1998	69801	16.02
31	.321	87709	39.58	61	2177	68406	15.34

TABLE XXVIII* Continued

Age	q_x	l_x	e^o_x	Age	q_x	l_x	e^o_x
62	2373	66917	14.67	87	19569	7368	3.65
63	2589	65329	14.01	88	20946	5926	3.41
64	2827	63638	13.37	89	22475	4685	3.18
65	3088	61839	12.74	90	24179	3632	2.96
66	3376	59929	12.13	91	26080	2754	2.74
67	3692	57906	11.54	92	28200	2036	2.54
68	4039	55768	10.96	93	30563	1462	2.34
69	4420	53516	10.41	94	33191	1015	2.15
70	4840	51151	9.86	95	36107	678	1.96
71	5301	48675	9.34	96	39333	433	1.79
72	5808	46095	8.83	97	42892	263	1.63
73	6365	43418	8.35	98	46807	150	1.47
74	6977	40654	7.88	99	51101	80	1.33
75	7650	37818	7.44	100	55795	39	1.19
76	8390	34925	7.01	101	60914	17	1.07
77	9201	31995	6.61	102	66479	7	0.95
78	10087	29051	6.22	103	72513	2	0.84
79	11033	26121	5.87	104	79039	1	0.74
80	12021	23259	5.53	105	86080		0.65
81	13033	20445	5.22	106	93657		0.56
82	14051	17780	4.93				
83	15065	15282	4.65				
84	16096	12980	4.39				
85	17172	10891	4.13				
86	18320	9021	3.89				

* This Life Table was kindly furnished to us in advance of publication by the Statistical Bureau of the Metropolitan Life Insurance Company.

TABLE XXVIII-B*

Complete Life Table for White Females (Including Mexicans
Classified as Other Races) for Iowa, Based on
1929-1931 Population Statistics

Age	q_x	l_x	e^o_x	Age	q_x	l_x	e^o_x
0	.04111	100000	65.90				
1	529	95889	67.71				
2	273	95382	67.07	32	313	89734	40.23
3	251	95122	66.25	33	322	89453	39.35
4	196	94883	65.41	34	332	89165	38.48
5	162	94697	64.54	35	345	88869	37.60
6	142	94544	63.64	36	360	88562	36.73
7	130	94410	62.73	37	379	88243	35.86
8	118	94287	61.82	38	401	87909	35.00
9	110	94176	60.89	39	425	87556	34.14
10	107	94072	59.95	40	450	87184	33.28
11	108	93971	59.02	41	477	86792	32.43
12	113	93870	58.08	42	504	86378	31.58
13	122	93764	57.15	43	531	85943	30.74
14	134	93650	56.22	44	558	85487	29.90
15	147	93525	55.29	45	587	85010	29.07
16	162	93388	54.37	46	619	84511	28.23
17	177	93237	53.46	47	655	83988	27.41
18	191	93072	52.55	48	696	83438	26.59
19	205	92894	51.65	49	741	82857	25.77
20	218	92704	50.76	50	792	82243	24.96
21	230	92502	49.87	51	848	81592	24.15
22	242	92289	48.98	52	909	80900	23.35
23	253	92066	48.10	53	976	80165	22.56
24	264	91833	47.22	54	1049	79383	21.78
25	273	91591	46.34	55	1129	78550	21.01
26	282	91341	45.47	56	1217	77663	20.24
27	289	91083	44.60	57	1316	76718	19.48
28	294	90820	43.72	58	1424	75708	18.74
29	298	90553	42.85	59	1544	74650	18.00
30	302	90283	41.98	60	1676	73478	17.28
31	307	90010	41.10	61	1819	72247	16.56

TABLE XXVIII* Continued

Age	q_x	l_x	e^o_x	Age	q_x	l_x	e^o_x
62	1974	70933	15.86	87	18378	10338	3.78
63	2142	69533	15.17	88	19905	8438	3.52
64	2326	68044	14.49	89	21593	6758	3.26
65	2532	66461	13.82	90	23448	5299	3.03
66	2763	64778	13.17	91	25475	4056	2.80
67	3023	62938	12.53	92	27662	3023	2.59
68	3318	61084	11.90	93	30075	2186	2.39
69	3651	59057	11.29	94	32661	1529	2.20
70	4023	56901	10.70	95	35450	1030	2.02
71	4440	54612	10.13	96	38449	665	1.85
72	4904	52187	9.58	97	41667	409	1.70
73	5418	49628	9.05	98	45112	239	1.55
74	5984	46939	8.54	99	48792	131	1.42
75	6606	44130	8.05	100	52716	67	1.29
76	7286	41215	7.58	101	56892	32	1.18
77	8026	38212	7.14	102	61328	14	1.07
78	8828	35145	6.72	103	66032	5	0.97
79	9686	32042	6.32	104	71014	2	0.87
80	10592	28938	5.94	105	76280	1	0.79
81	11540	25873	5.59	106	81839		0.70
82	12522	22887	5.25	107	87700		0.62
83	13538	20021	4.93				
84	14606	17311	4.63				
85	15751	14783	4.33				
86	17000	12455	4.05				

* This Life Table was kindly furnished to us in advance of publication by the Statistical Bureau of the Metropolitan Life Insurance Company.

* Explanatory Notes to Life Tables: q_x exhibits the rate of mortality per 100,000 persons--in other words the number dying in each age interval for each 100,000 alive at the beginning of the age interval. In the age interval under 1 year, the rate of mortality per 100,000 is 5,290 for males and 4,111 for females, which means that of 100,000 born males, 5,290 die before reaching age one, and out of 100,000 born females, 4,111 die before reaching this age. For the 50-51 age interval, the rate of mortality is 884 for males and 792 for females, meaning that, of each 100,000 males and 100,000 females who reach age 50, 884 males and 792 females die before reaching age 51.

l_x designates the number of persons alive at the beginning of each age interval out of 100,000 persons born alive. Thus, 94,710 males are alive at age 1, and 79,551 at the age of 50, out of 100,000 males born alive.

e^0_x expresses the complete expectation of life, namely the average length of life remaining to each person alive at the beginning of the age interval. The complete expectations of life are 63.04 years and 65.90 years for males and females, respectively; the expectation of life for age 50--the average number of years that an individual may expect to live after fifty--is 23.51 for males and 24.96 for females.

TRUE RATES OF NATURAL INCREASES, COMPUTED STABLE POPULATION,
STABLE BIRTH AND DEATH RATES

The ultimate growth of a population, as pointed out above, depends solely on the fertility of the population per se.³⁹ Of course, this

39. See: Introduction, also Past and Present Births, Birth Rates, and Fertility Rates.

presupposes that the population grows freely under the influence of the prevailing fertility, without being disturbed either by immigration or emigration, or changes in the mortality rates. The first step in determining the ultimate growth was made by computing the gross reproduction rates. They were calculated as 1,106 for the total population; 1,438 for the rural farm group; 1,117 for the rural non-farm group, and 885 for the urban group (Table XXIX, column 1). According to these rates, 1,000 born females of the total population would give birth to 1,106 daughters throughout the child-bearing period--provided none of the females dies before reaching or while passing through that period; 1,000 of the rural farm group will bear 1,177 daughters, etc. The second step was completed when the net reproduction rates were calculated on the basis of the gross reproduction rates and existing mortality rates. According to the net reproduction rate, 1,000 present mothers in the population as a whole will be replaced within a generation (28.4 years) by 1,001 potential mothers; in the rural farm population by 1,301; in the rural non-farm group by 1,010; and in the urban group by 801.⁴⁰ Accordingly, the rate

40. The mortality rates of the state as a whole were assumed for the different groups. Of course, there are some mortality differences; however, not probably of great significance so as to affect the net reproduction rates.

of growth per generation, when free from abnormalities of age composition, is for the total population 1 per thousand or 0.1 per cent; for the farm group, 300 per thousand or 30 per cent; for the non-farm group, 10 per thousand or 1 per cent; for the urban population, minus 199 per thousand or minus 20 per cent (Table XXIX, column 2). The final step was accomplished when the ultimate rates of growth per year--instead of per generation were computed. These rates per year, designated by *r*, were found to be 0.04 per thousand or 0.004 per cent for the total population; 9.26 per thousand or 0.93 per cent for the rural farm group; 0.36 per thousand or 0.04 per cent for the rural non-farm group; and minus 7.82 per thousand or minus 0.78 per cent for the urban group (Table XXIX, column 3).⁴¹

41. For the procedure of calculation of these rates, see Table XX.

TABLE XXIX

REPRODUCTION RATES AND TRUE RATES OF NATURAL INCREASE
OF IOWA POPULATION, 1929*

	Reproduction Rates		True Rates of Natural Increase (r per 1000) Per Year
	Gross	Net (R_0)	
	1	2	3
Rural Farm	1,438	1,301	9.26
Rural Non-farm	1,117	1,010	0.36
Urban	885	801	-7.82
Total	1,106	1,001	0.04

* Column 1 was taken from Table XXIII, column 8; column 2 was calculated from column 1; the survival factors of the state as a whole were assumed for the different groups. For the computation of the r's, see notes to Table XX.

These ultimate rates of growth are called "true" rates.

The true rate of natural increase of the Iowa total population, based on the gross reproduction rate of 1929 and the Iowa Life Table, was found to be 0.03525 per thousand per annum. The Iowa population is apparently to become stationary when its age composition has become stable. The population, except as it is disturbed by immigration and emigration, will ultimately conform to an age composition which will make the computed "true" rate of increase constant.

The ultimate or stable age composition of the Iowa population was computed by applying Bortkiewicz's formula: $\alpha_a = s_a e^{-ra}$; where α_a is the number of persons expected in the stabilized population; s_a is the number of persons in the corresponding age groups of the Life Table; "e" is the natural base of logarithms (2.71828); "r" is the true rate of increase; "a" stands for the pivotal ages 2.5, 7.5, etc. The computations for Iowa are given in Tables XXX and XXXI (see notes to Tables).

The percentage distribution of the different age groups in the stabilized population is given in Table XXXI. Clearly it is a much older population than the existing one.

As proved by Bortkiewicz,⁴² the stable or corrected birth rate--that

42. See: Robert R. Kuczynski, Fertility and Reproduction, Methods of Measuring the Balance of Births and Deaths, Falcon Press, New York, 1932, p. 87.

is, the birth rate which results from the application of existing fertilities to the stabilized population--equals the reciprocal of the summation of all the α_a 's ($\sum \alpha_a$). Since the total for the female population is 6,579,480 (bottom of column 5, Table XXX), the stable birth rate for the female population is 15.20 ($= \frac{1}{6,599,480}$).

By the same formula the stable birth rates of the male and total population were found to 15.89 and 15.54, respectively.

As another check against these calculations, the stabilized birth rate was also computed by applying the fertility rate to the theoretically computed stable age composition. The computation gave the same birth rate of 15.54 (Table XXXII, see notes to Table).

The "r", the "true" rate of natural increase as given above, is 0.03525 (per thousand). Consequently, the stable death rate is 15.50 (15.54 - .04). Thus, a birth rate of 15.54 will ultimately take the place of the existing birth rate of 17.1, decreasing by 1.6, even though no changes in the fertilities occur. A death rate of 15.5 will replace the present death rate of 10.4, increasing by 5.1 (an increase of about 50 per cent), if no changes take place in the mortality rates. These are the so-called corrected or stable birth and death rates.

TABLE XXX

COMPUTATION OF STABLE POPULATION OF IOWA*

$$d_a = s_a e^{-ra}$$

Age Groups	Survivors at Pivotal Ages, s(a)			Stable Population Basic Data,		
	Male	Female	e^{-ra}	Male	Female	Total
1	2	3	4	5	6	7
0-4	93,848	95,252	.99991	93,840	95,243	189,083
5-9	92,719	94,348	.99974	92,695	94,323	187,018
10-14	92,037	93,817	.99956	91,997	93,776	185,773
15-19	91,158	93,154	.99938	91,081	93,096	184,177
20-24	89,964	92,177	.99921	89,893	92,104	181,997
25-29	88,664	90,951	.99903	88,578	90,863	179,441
30-34	87,284	89,593	.99886	87,184	89,491	176,675
35-39	85,742	88,076	.99868	85,629	87,960	173,589
40-44	83,749	86,160	.99850	83,623	86,051	169,654
45-49	81,151	83,713	.99833	80,996	83,573	164,569
50-54	77,696	80,325	.99815	77,552	80,176	157,728
55-59	72,893	76,213	.99798	72,746	76,059	148,805
60-64	66,122	70,233	.99780	65,977	70,078	136,055
65-69	56,837	62,036	.99763	56,702	61,889	118,591
70-74	44,756	50,907	.99745	44,642	50,777	95,419
75-79	30,523	36,673	.99727	30,440	36,578	67,018
80-84	16,531	21,454	.99710	16,483	21,392	37,875
85-89	6,647	9,388	.99692	6,627	9,359	15,986
90-94	1,749	2,604	.99674	1,743	2,596	4,339
95-99	207	324	.99657	206	323	529
100 & over	5	9	.99639	5	9	14
TOTAL	1,260,242	1,317,412		1,258,639	1,315,696	2,574,335
	<u>x5</u>	<u>x5</u>		<u>x5</u>	<u>x5</u>	
	6,301,210	6,587,060		6,293,195	6,579,480	

Corrected Birth Rates (Male: 15.89
(Female: 15.20
(Total: 15.54

* Explanation on following page

*Explanation of preceding table

The data in column 2 which show the survival factors (l_x) of the center of the age groups were calculated on an arithmetic basis from the Life Tables: $\frac{l_x + l_{x+1}}{2}$; thus $l_x - \frac{1}{2}$ for the pivotal age 2.5

(center of the under 5 group) was computed by taking the arithmetic mean of l_2 and l_3 ($\frac{95,382 + 95,122}{2}$). In the same manner were obtained the data for the other pivotal ages until the end of the table.

The basic data for the stable population (columns 5 and 6 were computed on the basis of Bortkiewicz's formula:

$$\sigma_a = (1+i)^{-a} \cdot s_a \quad (1)$$

where σ_a indicates the number of persons of "a" years old in the stable population ("a" is taken at pivotal ages, corresponding thus to $x + \frac{1}{2}$); s_a - the number of persons in the Life Table at pivotal ages; these are survival factors, as given in column 2; i - the yearly increase (see R. Kuczynski, Fertility and Reproduction, Methods of Measuring the Balance of Births and Deaths, Falcon Press, New York, 1932, pp. 30-32, 40-42).

This formula expressed in terms of "r" (the "true" rate of increase) should read:

$$\sigma_a = s_a e^{-ra} \text{ or } \frac{s_a}{e^{ra}} \quad (2)$$

and not:

$$\sigma_a = s_a e^{ra} \text{ or } \frac{s_a}{e^{-ra}} \quad (3)$$

as constantly given by Kuczynski (in the above-mentioned book; pp. 32, 42, and 56). This can be easily seen from the following equations:

$$r = \frac{\log(1+i)}{\log e} \quad (\text{Kuczynski, p. 27}), \text{ or } r \log e = \log(1+i), \text{ or } \log(1+i) = \log e^r; \text{ obviously } (1+i) = e^r \quad (4)$$

Substituting $(1+i)$ from (4) into the original equation (1) we get:

$$\sigma_a = e^{r(-a)} \cdot s_a; \sigma_a = s_a e^{-ra} \quad (5=2)$$

"e" stands for the natural base of logarithms (=2.71828; "r" - natural rate of increase (in our case - 0.000035); "a" = 2.5, 17.5, 22.5 and so on. The corresponding data are tabulated in columns 5 and 6. The data of column 7 are the sum of the columns 5 and 6.

TABLE XXXI

AGE DISTRIBUTION OF IOWA STABLE POPULATION:
MALE, FEMALE AND TOTAL*

Age Groups	Male	Female	Total
1	2	3	4
0- 4	7.46	7.24	7.34
5- 9	7.36	7.17	7.26
10-14	7.31	7.13	7.22
15-19	7.24	7.08	7.15
20-24	7.14	7.00	7.07
25-29	7.04	6.91	6.97
30-34	6.93	6.80	6.86
35-39	6.80	6.68	6.74
40-44	6.64	6.54	6.59
45-49	6.43	6.35	6.39
50-54	6.16	6.09	6.13
55-59	5.78	5.78	5.78
60-64	5.24	5.33	5.29
65-69	4.50	4.70	4.61
70-74	3.55	3.86	3.71
75-79	2.42	2.78	2.60
80-84	1.31	1.63	1.47
85-89	0.53	0.71	0.62
90-94	0.14	0.20	0.17
95 and over	0.02	0.02	0.02
TOTAL	100.00	100.00	100.00

* The age distribution was computed on the basis of the basic data of the stable populations as given in Table XXX, columns 5, 6, and 7.

The procedure is simple: every item in the column is divided by its corresponding total and the resultant multiplied by 100; in other words, every item is multiplied by the reciprocal of the total. For example, 93,840 (the under 5 group of the male population, column 5) is multiplied by the reciprocal of its total; namely, by $\frac{1}{1,258,639}$; the resultant is 7.46.

TABLE XXXII

COMPUTATION OF BIRTH RATE IN IOWA
FOR STABLE POPULATION*

Age Groups	Age Distribution of Females (Stable Population)	Maternity Frequency m(a) per 100,000 Females	Number of children Born
	Per Cent		
1	2	3	4=2x3
10-14	7.13	18	1.28
15-19	7.08	3,774	267.20
20-24	7.00	11,754	822.78
25-29	6.91	12,211	843.78
30-34	6.80	9,065	616.42
35-39	6.68	5,953	397.66
40-44	6.54	2,385	155.98
45-49	6.35	219	13.91
50-54	6.09	2	0.12
TOTAL	60.58		3,119.13

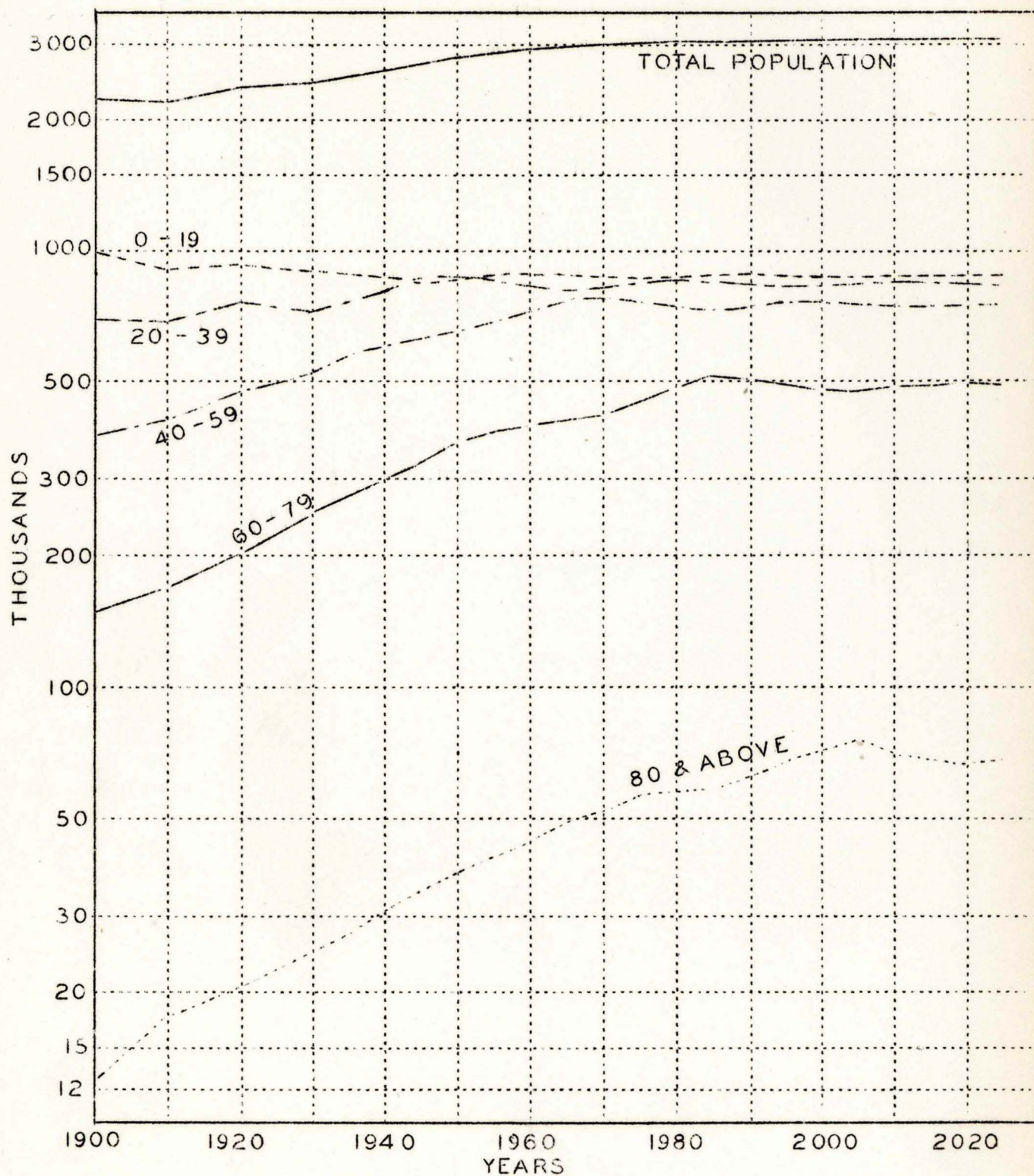
Birth rate: 15.54

* The data for column 2 were taken from Table XXXI, column 3. The data for column 3 were adapted from Table XIX, columns 5 and 6; these are the summations of the two columns. The total is 3,119 (bottom of column 3), which means that a population with such an age-distribution should give birth yearly to 3,119 children. The birth rate should be 15.54 (3,119 divided by 201 as the ratio of males to females is 101:100).

IOWA POPULATION

TOTAL AND BROAD AGE PERIODS

1900 - 2025



IOWA STATE PLANNING BOARD
FIG. 19

W. P. A.
PROJECT
2 9 2 9

FUTURE GROWTH

While the ultimate rate of growth of a population unaffected by immigration or emigration is a function of fertility only, its growth before it has achieved stability of age structure depends also on its prevailing age composition. In order to find the future growth of a population it is necessary, consequently: first, to determine the ultimate or "true" rate of increase; second, to find the time when the stabilization process will be completed; and third, to determine the level the population will reach in its growth--under the influence of the age factors--at the stabilization point. It is from that time on and from that level that the population will grow in accordance with its "true" rate of increase. In the case of Iowa, the population will become at that time and at that level almost stationary, as the "true" rate of increase is only slightly above the zero point.

When Will The Stabilization Point Be Reached?

To calculate the length of time which will be required for the Iowa population to reach its stabilization point, the following procedure was adopted.

It is clear that the persons under five years of age in 1930 will make up the group five to nine years of age in 1935; the group aged five to nine years in 1930 will constitute the group aged ten to fourteen in 1935, and so on. Not all of them will survive. If, out of 100,000 males who started life together, 93,848 reach the pivotal age 2.5 (the under 5 group - Table XXX, column 2), and but 92,719 out of the same 100,000 remain alive at the pivotal age 7.5 (the 5-9 group), then obviously, the probability of the under 5 group to survive in the 5-9 group is 0.98797 (92,719/93,848). Probabilities of survival were calculated for all age groups in the Iowa population of 1930 (Table XXXIII, columns 4 and 5). Since there were 111,218 males in the under 5 group in 1930, there should be, on this basis, 109,880 males in the 5-9 group of 1935 ($111,218 \times 0.98797$) of the 122,146 males of the 5-9 group in 1930, 121,247 should survive in 1935 ($122,146 \times 0.99264$), and so on. By multiplying every male and female age group in the Iowa population of 1930 by its probability to survive five years, ($\frac{l_x + 5}{l_x}$), the probable population for 1935 was found for all

$$\frac{l_x + 5}{l_x}$$

age groups from the 5-9 group up. As for the under 5 group for 1935, the following procedure of calculation was undertaken.

The under 5 group should consist of the children born during this five-year period, 1930-1935. To find the number of children born, the mean population in each of the reproductive five-year age groups from 10-54 was computed for the period 1930-1935. The 10-14 group, for instance, of 1930 counted 115,233 females, the number of females of the same group

TABLE XXXIII

COMPUTATION OF IOWA POPULATION FOR 1935

Age Interval	1930 Population		Probabilities to Survive 5 years (l_{x+5}/l_x)		1935 Population		Daughters Born in 1930-1935
	Male	Female	Male	Female	Male	Female	
1	2	3	4	5	6	7	8
0-4	111,218	106,773	.93848	.95252	104,000	100,338	
5-9	122,146	118,423	.98797	.99051	109,880	105,760	
10-14	118,659	115,233	.99264	.99437	121,247	117,758	8
15-19	112,060	109,678	.99023	.99293	117,500	114,418	2,087
20-24	99,070	100,327	.98712	.98951	110,617	108,527	5,947
25-29	98,253	90,300	.98555	.98670	97,638	98,993	5,608
30-34	86,375	86,796	.98443	.98507	86,879	88,952	3,893
35-39	89,459	86,402	.98233	.98307	84,849	85,327	2,536
40-44	79,288	76,704	.97676	.97825	87,380	84,523	892
45-49	73,917	69,204	.96874	.97160	76,809	74,526	90
50-54	64,475	60,727	.95766	.95953	70,787	66,403	1
55-59	55,642	51,081	.93818	.94881	60,489	57,618	
60-64	47,821	43,908	.90711	.92154	50,473	47,073	
65-69	37,664	34,864	.85958	.88329	41,106	38,783	
70-74	28,200	25,773	.78744	.82060	29,658	28,609	
75-79	16,407	15,518	.68199	.72049	19,232	18,569	
80-84	7,928	8,289	.54159	.58493	8,886	9,076	
85-89	3,134	3,593	.40209	.43759	3,188	3,627	
90-94	713	873	.26313	.27738	825	997	
95-99	119	136	.11335	.12442	84	109	
100 & over	18	14	.02415	.02778	2	4	
TOTAL	1,242,566	1,204,616			1,281,529	1,249,990	21,068

TABLE XXXIV

IOWA TOTAL POPULATION BY BROAD AGE PERIODS, 1930-2025

Year	0-19	20-39	40-59	60-79	80 & above	Total
1	2	3	4	5	6	7
1930	914,192	726,962	531,038	250,155	24,817	2,447,164
1935	890,901	761,782	578,535	273,503	26,798	2,531,519
1940	869,657	811,731	607,601	297,963	30,944	2,617,896
1945	853,372	863,328	627,013	325,656	34,242	2,703,611
1950	864,793	872,601	655,396	351,703	37,726	2,782,221
1955	885,571	850,385	687,933	382,844	40,593	2,847,326
1960	889,585	829,924	733,548	399,455	44,523	2,897,035
1965	882,841	814,670	779,613	410,076	48,851	2,936,051
1970	874,432	825,774	786,347	428,861	52,371	2,967,785
1975	872,094	845,432	764,674	454,938	57,115	2,994,253
1980	875,718	849,080	746,365	486,109	57,730	3,015,002
1985	879,980	843,639	734,732	513,542	58,305	3,030,198
1990	862,393	834,613	746,585	510,914	62,295	3,036,800
1995	881,147	832,468	763,636	491,510	67,399	3,036,160
2000	879,194	835,961	765,668	481,093	71,893	3,033,809
2005	878,486	840,007	759,542	479,754	74,583	3,032,377
2010	878,784	842,275	751,649	490,410	70,263	3,033,381
2015	880,385	841,062	750,014	498,764	65,405	3,035,630
2020	881,405	839,540	753,276	497,253	66,507	3,037,981
2025	881,918	838,543	757,185	492,268	68,983	3,038,897

in 1935 was computed as 117,758; consequently, the mean population of this group for this period, computed on an arithmetical basis, should count 116,495 females ($\frac{117,758 + 115,233}{2}$). As the maternity frequency

for this group is 7 daughters per 100,000 females, this group gives birth on the average to 8 daughters in a year ($\frac{116,495 \times 7}{100,000}$). By this procedure

it was found that the Iowa population should give birth to 21,068 daughters per year for a total of 105,340 ($21,068 \times 5$) during the 1930-1935 period. The ratio of born males to born females is 105.2, the number of sons born during this period would be 110,818 ($105,340 \times 1.052$). These children, 110,818 sons and 105,340 daughters, should constitute the under 5 group of 1935, provided none of them dies. Their survival factors, however, are 0.93848 and 0.95252 for males and females, respectively; consequently, the under 5 group of 1935 should count 104,000 sons and 100,338 daughters. The computation of the 1935 male and the female populations is thus complete.

This procedure was successively repeated in computing the 1940 population on the basis of 1935; the 1945 population on the basis of 1940, and so on up to 2025.⁴³ The successive populations are summarized by

43. These tables by five-year age groups are given in the Appendix.

large age periods in Table XXXIV.

As seen from Table XXXV, column 7, the totals of the population are becoming constant by the end of the century. Such a constancy indicates that the age composition of the population becomes stable at about that time. This inference was tested by computing on the basis of the separate tables the age distribution of the Iowa population by percentages for the years 1950, 1975, and 2000 and comparing the percentage distribution at each of these years with that of the theoretically stable population (Table XXXVI).

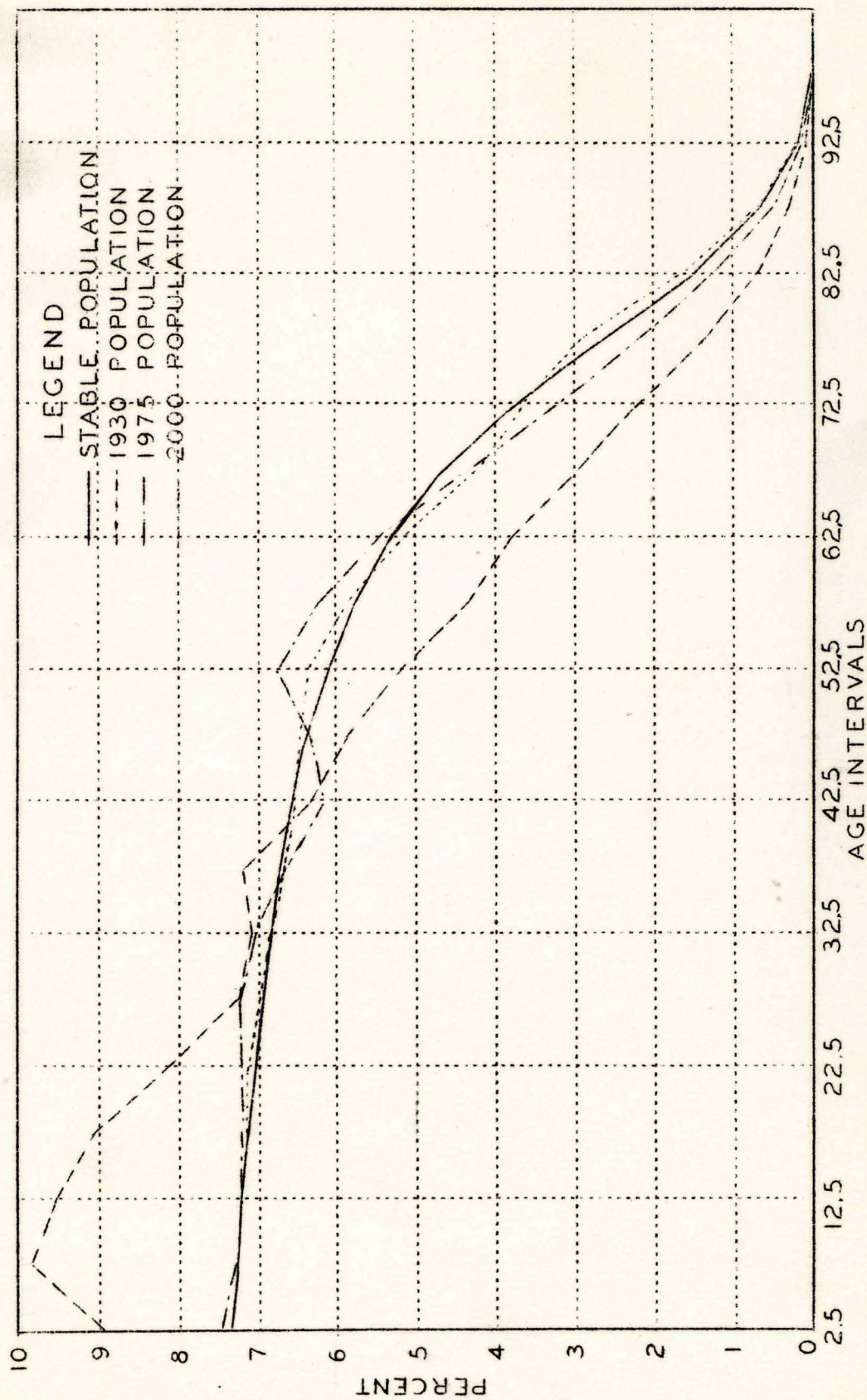
The striking contrast between the age composition of 1930 and that of the stable population is revealed in Figure 20. The curve showing the age distribution of the 1930 population is, for the group under forty years of age, much above the curve representing the stable population, but it is much below the latter for the more advanced age groups. In 1975, the age-distribution curve will more closely resemble the curve for the stable population, and by the year 2000 the two curves will practically coincide. In other words, the stabilization of the Iowa population will be practically completed in the last quarter of the present century. It will take, evidently, about two generations for the irregularities of the present age structure to be smoothed out.

TABLE XXXV

IOWA POPULATION FOR 1930-2025 (TOTAL AND OF DIFFERENT
AGE-GROUPS) COMPARED WITH 1930 AS BASE

Years	Age-Groups					Total
	0-19	20-39	40-59	60-79	80 & above	
1	2	3	4	5	6	7
1930	100.0	100.0	100.0	100.0	100.0	100.0
1935	97.4	104.8	108.9	109.3	108.0	103.4
1940	95.1	111.7	114.4	119.1	124.7	107.0
1945	93.3	118.7	118.1	130.2	138.0	110.5
1950	94.6	120.0	123.4	144.6	152.0	114.1
1955	96.9	117.0	129.5	153.0	163.6	116.3
1960	97.3	114.2	138.1	159.7	179.4	118.4
1965	96.6	112.1	146.8	163.9	196.8	120.0
1970	95.6	113.6	148.1	171.4	211.0	121.3
1975	95.4	116.3	144.0	181.9	230.1	122.4
1980	95.8	116.8	140.5	194.3	232.6	123.2
1985	96.3	116.0	138.4	205.3	234.9	123.8
1990	96.5	114.8	140.6	204.2	251.0	124.1
1995	96.4	114.5	143.8	196.5	271.6	124.1
2000	96.2	115.0	144.2	192.3	289.7	124.0
2005	96.1	115.5	143.0	191.8	300.5	123.9
2010	96.1	115.9	141.5	196.0	283.1	123.9
2015	96.2	115.8	141.4	197.7	274.7	124.0
2020	96.4	115.5	141.8	198.8	268.0	124.1
2025	96.5	115.3	142.6	196.8	278.0	124.2

PER CENT DISTRIBUTION OF IOWA POPULATION



IOWA STATE PLANNING BOARD

FIG. 20

W. P. A.
PROJECT
2929

TABLE XXXVI

PER CENT DISTRIBUTION OF IOWA POPULATION (YEARS:
1930, 1950, 1975, 2000), AS COMPARED WITH THE
DISTRIBUTION OF STABLE POPULATION

Age Groups	Stable Population	Years:			
		1930	1950	1975	2000
1	2	3	4	5	6
0- 4	7.34	8.91	8.21	7.45	7.32
5- 9	7.26	9.83	8.01	7.29	7.24
10-14	7.22	9.56	7.13	7.20	7.23
15-19	7.15	9.06	7.61	7.18	7.19
20-24	7.07	8.15	7.52	7.26	7.12
25-29	6.97	7.50	8.27	7.28	6.99
30-34	6.86	7.08	7.97	7.06	6.80
35-39	6.74	7.19	7.49	6.64	6.65
40-44	6.59	6.37	6.66	6.14	6.53
45-49	6.39	5.85	5.87	6.34	6.48
50-54	6.13	5.12	5.54	6.79	6.35
55-59	5.78	4.36	5.40	6.27	5.88
60-64	5.29	3.75	4.48	5.48	5.16
65-69	4.61	2.96	4.05	4.34	4.22
70-74	3.71	2.20	2.71	3.18	3.63
75-79	2.61	1.30	1.71	2.19	2.84
80-84	1.47	0.66	0.92	1.28	1.57
85-89	0.62	0.27	0.35	0.49	0.62
90-94	0.17	0.07	0.09	0.12	0.16
95 & over	0.02	0.01	0.01	0.02	0.02
TOTAL	100.00	100.00	100.00	100.00	100.00

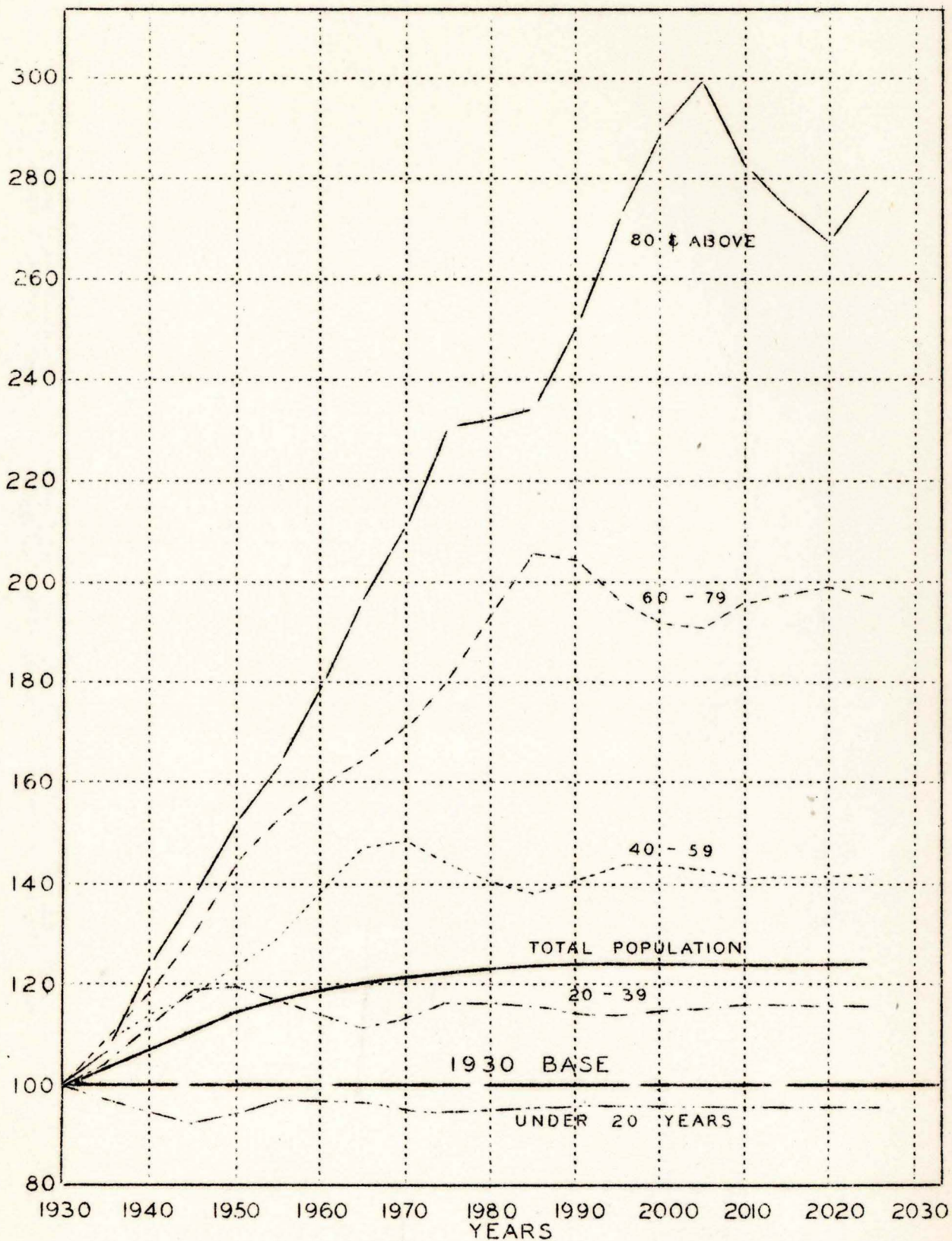
The Immediate Growth of the Iowa Population

As brought out by Table XXXIV and Figure 19, Iowa's population will continue to increase for about two generations, notwithstanding the fact that the fertilities in 1929 were just sufficient to maintain it. But, as has been pointed out, this increase is due only to the age factors. The total population will increase until about 1990 and then become stationary or nearly so; beyond that point the growth curve becomes a straight line. The total population will reach, before the stabilization point, a level of about 24 per cent above the 1930 base (Table XXXV, column 7).

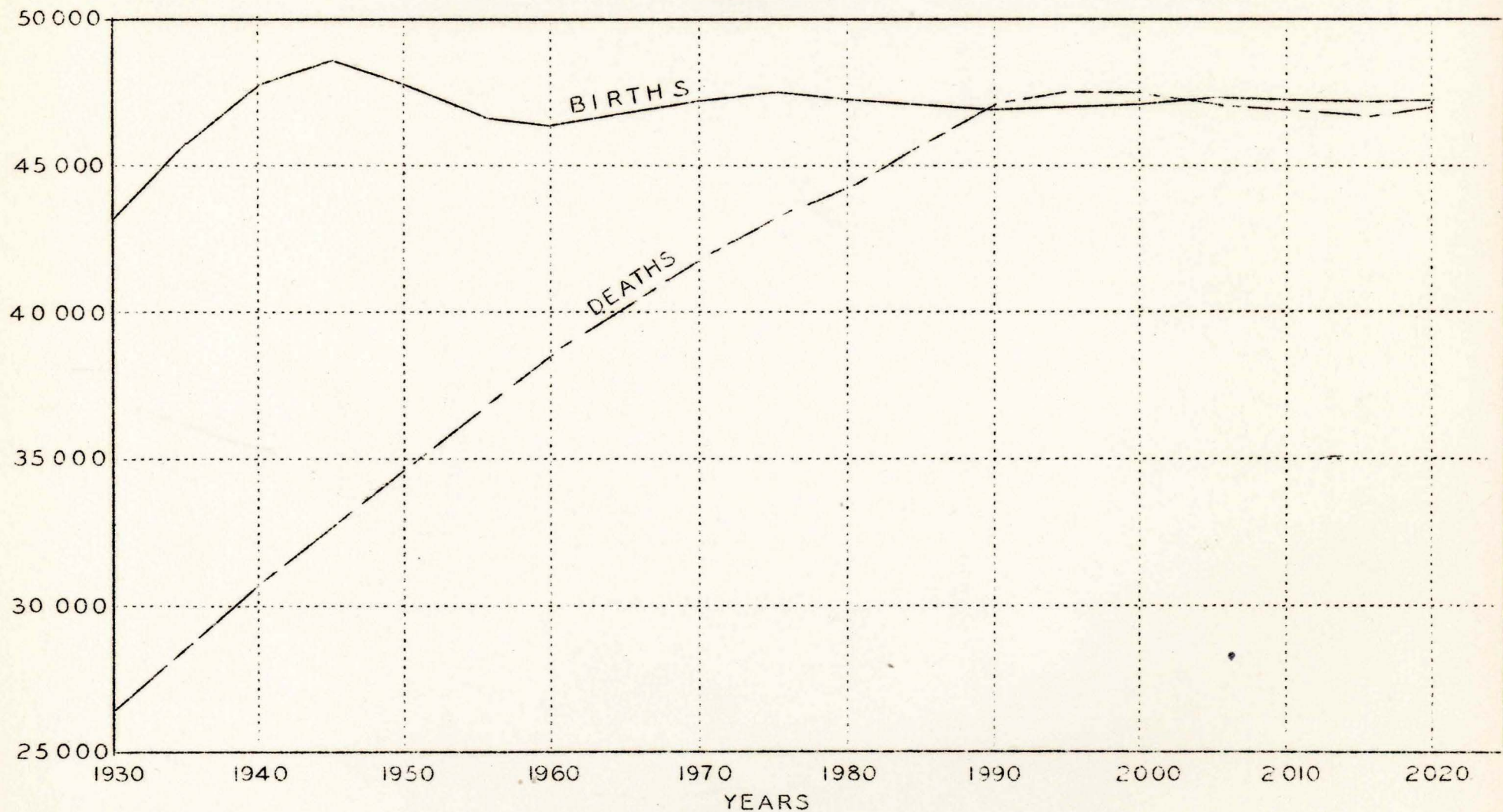
Obviously, it is at the end of the present century and at a level 24 per cent above the 1930 base, that the Iowa population will become stationary. However, this increase will be mostly concentrated in the age groups of 40 and above. The young group of under 20 years of age will decrease. When stabilized, this group will make up 96 per cent of what it was in 1930. The age group of 20-39 will show an increase of 15 per cent against the 24 per cent increase of the total population; the 40-49 age group will be about 43 per cent above 1930; the 60-79 group will about double, and the 80 and above group will almost triple, (See Table XXXV and Figure 21).

The 10-19 age group will reach its highest point of growth around the sixties, as will also the next age group of 20-39. The 40-59 age group will attain its peak with the end of the century. The older age group will increase even beyond the year 2000: the 60-79 group will become stationary at about the year 2015; but the 80 and above group will continue to increase even beyond the first quarter of the next century.

IOWA POPULATION - 1930-2025 (TOTAL AND OF DIFFERENT AGE GROUPS) COMPARED WITH 1930 AS BASE



ESTIMATED BIRTHS AND DEATHS OF IOWA POPULATION 1930-2020



IOWA STATE PLANNING BOARD

FIG. 22

W. F. A.
PROJECT
2 9 2 9

FUTURE BIRTHS AND BIRTH RATES,
DEATHS AND DEATH RATES

During the process of stabilization significant changes will take place in the births and birth rates and the deaths and death rates of the population.

It was shown above that the stable birth rate will be 15.54, and the stable death rate 15.50. There will be, consequently, a gradual decline in the birth rate from 17.1 in 1929 to 15.54 at about the end of the century, followed by a parallel rise in the death rate from 10.4 to 15.5, during the same time. These subsequent changes are given in Table XXXVII and plotted in Figures 22 and 23.

The manner in which the births were computed was explained above. As to the deaths, let it be assumed that the whole 1930 population will be alive in 1935, and let it be also supposed that all the children born during this five-year period will survive; then, the population in 1935 would be 2,447,184 (total population in 1930) plus 216,158 (110,813 sons and 105,340 daughters) births, or 2,663,332. However, the total for 1935 was, as calculated, 2,531,512; consequently, 131,813 persons died during these five years, or 26,363 per year. By this procedure the number of deaths and the death rates for the populations of the other years were calculated.

Seemingly no great changes will occur in the numbers of births. The stabilized number of female births will be about 47,000, whereas the 1929 statistics give 42,000 births. The number of births will evidently become about constant within one generation.

The great changes will take place in the numbers of deaths. These rise very sharply. The mortality statistics give 25,363 deaths for Iowa in 1929. This number will increase to 47,100, according to the computations only 180 below the number of births. In fact, the deaths may even surpass the births before stability is reached. (Compare the births and deaths for the years 1990-2005, Table XXXVII and Figure 22).

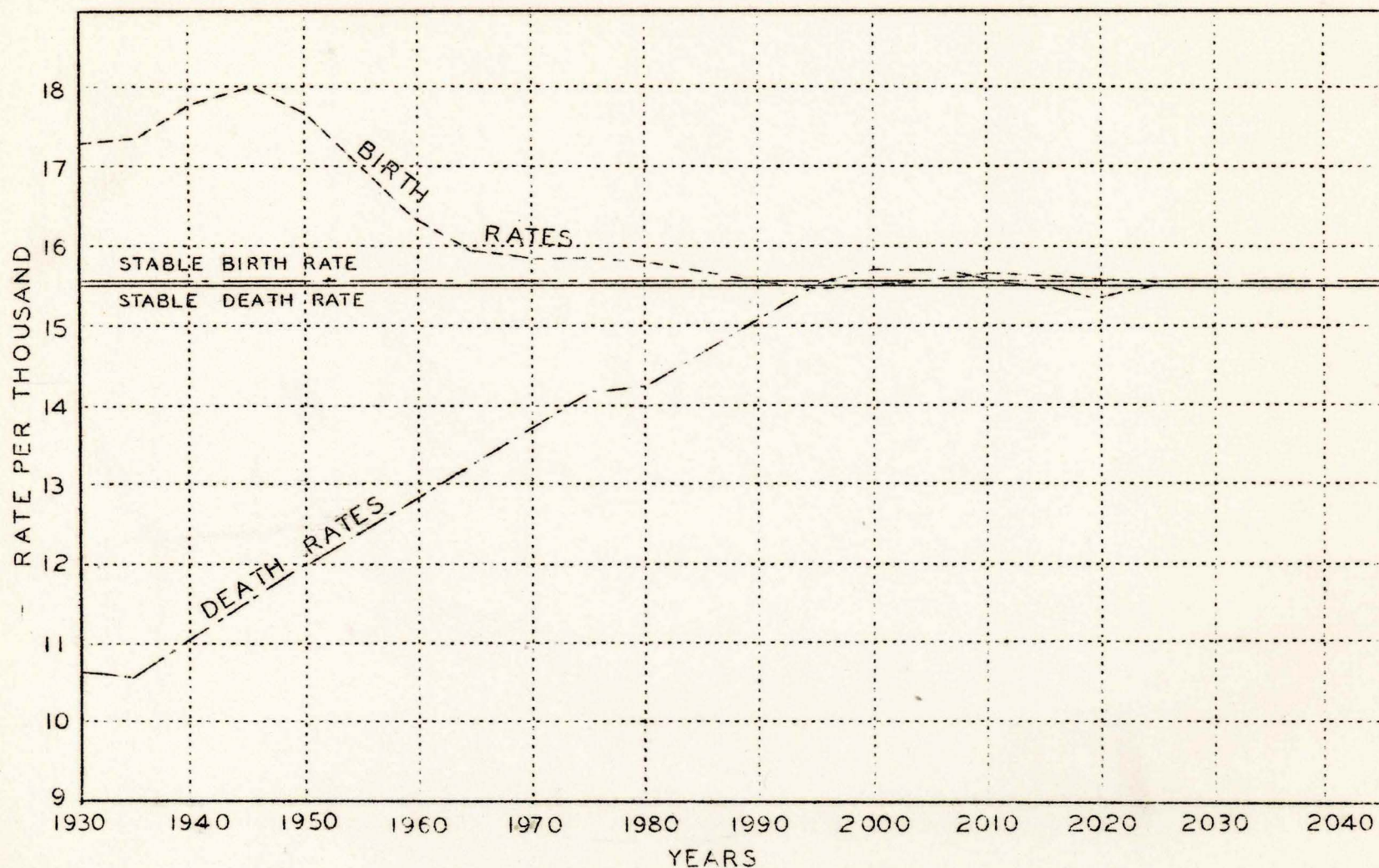
The future birth rates will increase at first due to the age factors--as paradoxical as it may seem--and then gradually decline. They will become constant at about 15.56 as seen from Table XXXVII, column 5. This again furnishes an additional check upon the theoretical computation of the stable birth rate. The future death rates will rise abruptly, fluctuating ultimately around 15.50--in consistency with the theoretical computed death rate.

TABLE XXXVII

BIRTHS AND DEATHS, BIRTH
AND DEATH RATES OF IOWA POPULATION,
1935-2025

Years	Mean Populations	Births	Deaths	Birth Rates	Death Rates
1	2	3	4	5=(3:2)	6=(4:2)
1930-1935	2,439,351	43,231	26,364	17.37	10.59
1935-1940	2,574,707	45,761	28,486	17.77	11.06
1940-1945	2,660,753	47,847	30,704	17.98	11.54
1945-1950	2,742,916	48,527	32,805	17.69	11.96
1950-1955	2,814,773	47,735	34,714	16.96	12.33
1955-1960	2,872,180	46,670	36,728	16.25	12.79
1960-1965	2,916,543	46,413	38,610	15.91	13.24
1965-1970	2,951,918	46,707	40,360	15.82	13.67
1970-1975	2,981,019	47,211	41,917	15.84	14.16
1975-1980	3,004,627	47,438	43,288	15.79	14.41
1980-1985	3,022,600	47,329	44,290	15.66	14.65
1985-1990	3,033,499	47,090	45,770	15.52	15.09
1990-1995	3,036,480	46,951	47,079	15.46	15.50
1995-2000	3,034,984	47,016	47,486	15.49	15.65
2000-2005	3,033,093	47,176	47,462	15.55	15.65
2005-2010	3,032,879	47,291	47,090	15.59	15.53
2010-2015	3,034,505	47,295	46,845	15.59	15.44
2015-2020	3,036,795	47,238	46,772	15.56	15.40
2020-2025	3,038,429	47,287	47,100	15.56	15.50

ESTIMATED BIRTH & DEATH RATES OF IOWA POPULATION 1930-2025

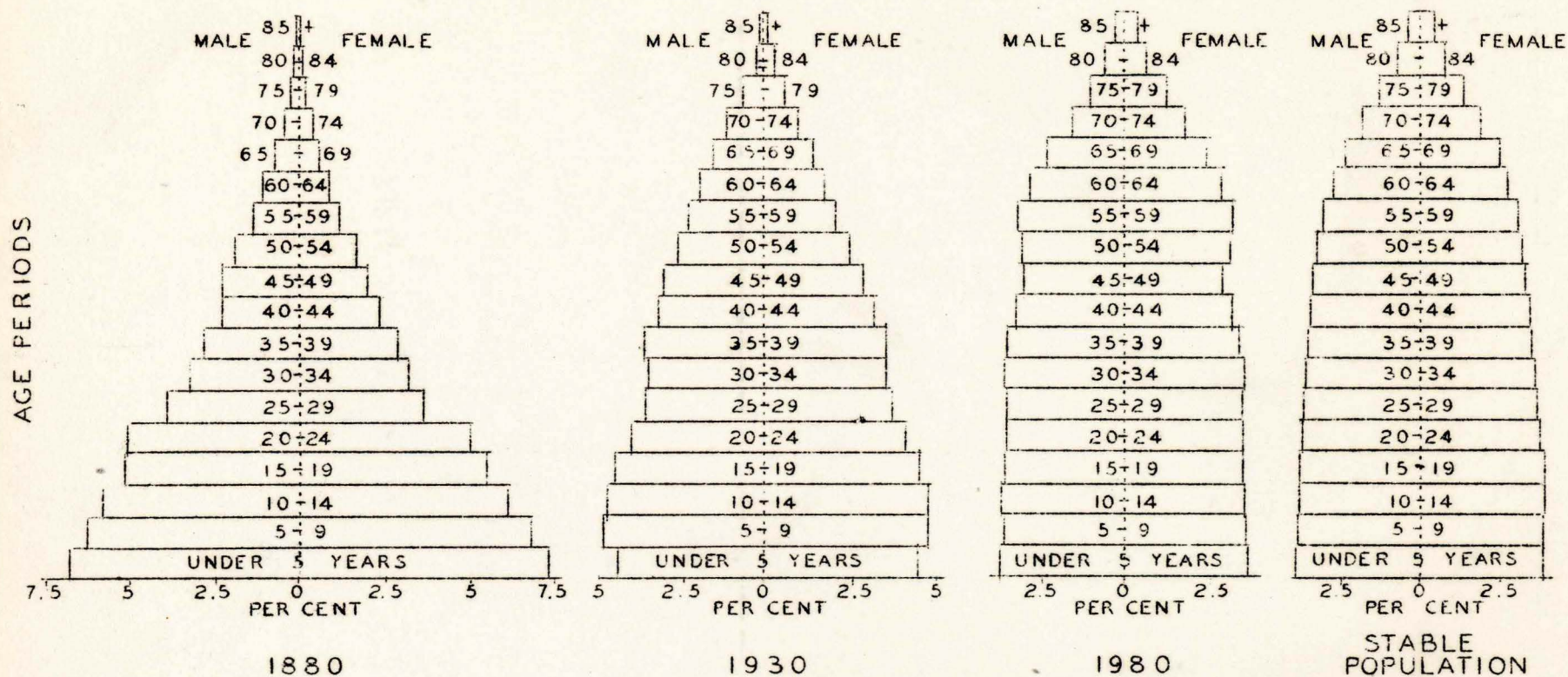


IOWA STATE PLANNING BOARD

FIG. 23

W. P. A.
PROJECT
2929

PER CENT DISTRIBUTION OF IOWA POPULATION BY FIVE-YEAR AGE-PERIODS 1880 1930 1980 AND STABLE POPULATION



IOWA STATE PLANNING BOARD

FIG. 24

W. P. A.
PROJECT
2 9 2 9

CHANGES IN THE FUTURE AGE COMPOSITION OF IOWA POPULATION

Among the most important changes that will take place in the population are those in age composition. Such changes have been taking place in the Iowa population for some time.⁴⁴

44. See above: Age Composition of Iowa Population

These shifts in the age composition will be more and more enhanced as the stabilization process goes on. When stabilized, the young group of under 20 will make up only 29.0 per cent of the total population, as compared with the 37.4 per cent of the same group in 1930 (Table XXXVIII). The 20-39 group will decline from 29.7 per cent in 1930 to 27.6 per cent in the stabilized population. On the other hand, the proportions of the older age group will be very much increased. In 1930, 21.7 per cent of the total population belonged to the 40-59 age group, but when stabilized its percentage will rise to 24.9. The 60-79 group which constituted in 1930, 10 per cent of the total female population, will make up 16 per cent in the stable population. The 80 and above group will rise from 1 per cent in 1930, to 2.3 per cent when stabilized. These great changes in our future age composition are graphically presented in Figure 24, where the age composition, by five-year periods, of the stable population is contrasted with those of 1880, 1930, and 1980. A pronounced contraction at the base of the stable population pyramid, as compared with the one of 1880 or 1930, is to be noticed, accompanied by an outstanding expansion at the top. The 1930 population occupies a middle position, portraying a population with heavily increasing numbers at the top of the pyramid. This means that the population will become steadily more weighted with older people, as time goes on.

Such age changes will undoubtedly mean new social and economic adjustments.

TABLE XXXVIII

PERCENTAGES OF IOWA TOTAL POPULATION BY BROAD AGE PERIODS, 1930-2025

Year	Age Periods					Total
	0-19	20-39	40-59	60-79	80 & above	
1	2	3	4	5	6	7
1930	37.4	29.7	21.7	10.2	1.0	100.0
1935	35.2	30.1	22.8	10.8	1.1	100.0
1940	33.2	31.0	23.2	11.4	1.2	100.0
1945	31.6	31.9	23.2	12.0	1.3	100.0
1950	31.0	31.2	23.5	12.9	1.4	100.0
1955	31.1	29.9	24.2	13.4	1.4	100.0
1960	30.7	28.7	25.3	13.8	1.5	100.0
1965	31.0	27.7	26.6	14.0	1.7	100.0
1970	29.5	27.8	26.5	14.4	1.8	100.0
1975	29.1	28.2	25.6	15.2	1.9	100.0
1980	29.0	28.2	24.8	16.1	1.9	100.0
1985	29.0	27.8	24.3	17.0	1.9	100.0
1990	29.1	27.5	24.6	16.8	2.0	100.0
1995	29.0	27.4	25.2	16.2	2.2	100.0
2000	29.0	27.5	25.2	15.9	2.4	100.0
2005	29.0	27.7	25.0	15.8	2.5	100.0
2010	29.0	27.8	24.8	16.1	2.3	100.0
2015	29.0	27.7	24.7	16.4	2.2	100.0
2020	29.0	27.6	24.8	16.4	2.2	100.0
2025	29.0	27.6	24.9	16.2	2.3	100.0
STABLE POPULATION	29.0	27.6	24.9	16.2	2.3	100.0



STATE LIBRARY OF IOWA



3 1723 02106 7061